Media and Communication
Open Access Journal | ISSN: 2183-2439
Volume 7, Issue 2 (2019)

Critical Perspectives on Digital Literacies: Creating a Path Forward

Editor
Hiller A. Spires

COGITATIO

Media and Communication, 2019, Volume 7, Issue 2
Critical Perspectives on Digital Literacies: Creating a Path Forward

Published by Cogitatio Press
Rua Fialho de Almeida 14, 2º Esq.,
1070-129 Lisbon
Portugal

Academic Editor
Hiller A. Spires, North Carolina State University, USA

Available online at: www.cogitatiopress.com/mediaandcommunication

Table of Contents

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 1–3
DOI: 10.17645/mac.v7i2.2209

Editorial

Critical Perspectives on Digital Literacies: Creating a Path Forward

Hiller A. Spires

Department of Teacher Education and Learning Sciences, North Carolina State University, Raleigh, NC 27695, USA;
E-Mail: haspires@ncsu.edu

Submitted: 30 April 2019 | Published: 11 June 2019

Abstract
This thematic issue of Media and Communication features a range of critical perspectives on digital literacies with the aim of shedding light on a path forward with respect to theory, research and practice. The issue hosts fourteen articles divided into four themes that address digital literacies in varying ways. The four themes are (a) defining digital literacies, (b) socio-cultural theories of digital literacies, (c) digital literacies in practice, and (d) digital skills and efficacy. The articles make a strong case for the continued exploration of the significance and (re)definition of digital literacies within our global communicative landscape. The authors have inspired new dialogue, research directions, innovative practices, and policy on digital literacies. As digital technologies continue to evolve so too will intellectual frameworks—generating nuance and scope for and by researchers as well as practitioners.

Keywords
critical perspectives; digital literacies; digital media; socio-cultural theory

Issue
This editorial is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

Many would agree there is no consensus on a model or framework for digital literacies that adequately meet the demands of our contemporary global society. Academics typically resist both utopian and dystopian perspectives on digital literacies models so as not to limit their transformative potential. With that caveat in mind, one way to think about digital literacies is to organize the related cognitive and social processes into three categories: (a) locating and consuming digital content; (b) creating and curating digital content; and (c) communicating digital content (Spires & Bartlett, 2012). It is essential to make judgments about when and how to apply information to solve problems and share new knowledge. Most importantly, digital literacies exist within sociocultural contexts that give them shape and definition.

Learning happens everywhere and all the time. With the growing emphasis of digital frames of reference and tools what we learn can be amplified and shared globally in an instant. The repercussions of this phenomena are hard to grasp and even more challenging to conceptualize in a clear, compelling fashion. Russian theorist, Vygotsky's (1978) sociocultural theory of learning situates digital literacy and learning. Vygotsky's view of learning stems from social interactions between humans and the learning that transpires. His theory still applies to contemporary settings in which learning takes place when humans interact with digital technologies.

More than ever before, contemporary life is mediated by digital technologies and frames of reference. The same digital advances that enhance our work and social life also challenge our social norms, creating a constant recalibration of our sensibilities surrounding digital literacies. Challenges notwithstanding, digital literacies expertise should be positioned as a prerogative for all humans, which ultimately supports full participation in a global society.

This thematic issue of *Media and Communication* features articles on digital literacies from a variety of domains (i.e., communication, education, psychology, linguistics). Likewise, the articles target multiple audiences,

including educational practitioners, theoreticians, and researchers. Digital literacies is a growing area of scholarship and one that is marked by ambiguity, nuance, and promise—primarily because technology shifts faster than society and the educational sector can. Leu and his colleagues (Leu et al., 2015) used the term deictic to refer to the changing nature of literacy, which is prompted by constantly evolving technologies within our society. By all accounts, technological changes will continue since the total number of Internet users is over 4 billion worldwide and growing.

This thematic issue focuses on critical perspectives of digital literacies for two reasons. First, within the digital world, it is essential to comparatively scrutinize information in terms of its credibility and reliability due to the open-ended nature of internet authorship. Second, critical perspectives designate the inherent social advantages and disadvantages afforded by access to and usage of digital technologies and information within our global society. As we consume and construct digital texts it is essential to understand socially constructed concepts, such as power, inequality, and injustice in human relationships. Above all, human agency is at the core of what it means to be digitally literate.

2. Contributions in This Thematic Issue

This thematic issue presents a range of critical perspectives on digital literacies with the aim of shedding light on a path forward with respect to theory, research and practice. The issue hosts fourteen articles divided into four themes that address digital literacies in varying ways. The four themes are (a) defining digital literacies, (b) sociocultural theories of digital literacies, (c) digital literacies in practice, and (d) digital skills and efficacy.

2.1. Defining Digital Literacies

For the first theme of defining digital literacies, Leaning (2019) opens the thematic issue by arguing that integrating media and information literacy provides a sophisticated definition as well as direction for digital literacy. Nichols and Stornaiuolo (2019) propose a multidimensional framework for understanding digital literacies. Engaging assemblage theory, the authors explore current articulations of digital literacy as well as those that have been discarded. They invite the field to consider the "assemblage" of digital literacies to create a new research path. Godhe (2019) targets the curricula in Sweden, Denmark, Finland, and Norway and compares and contrasts how digital literacy and digital competence are interpreted within school contexts. Finally, Lee, Park, Jang and Cho (2019) adopt the idea of theoretical triangulation in interpretive inquiry to explore how multiple perspectives (i.e., sociocultural, affective, and cognitive) can articulate the intricacies of youth's digital literacy practices.

2.2. Socio-Cultural Theories of Digital Literacies

For the second theme, socio-cultural theories of digital literacies, Lund, Furberg and Gudmundsdottir (2019) consider digital literacies as agentic and transformative through an empirical study on how lower secondary students engage digital and other resources as they encounter science problems. In another empirical study, Pawluczuk, Webster, Smith and Hall (2019) explore the ways digital youth workers perceive and evaluate the social impact of their work. Taking a markedly different stance, Bali (2019) re-imagines digital literacies in general as well as teaching digital literacies (i.e., consuming, producing and communicating) through the critical feminist perspective presented in *Women's Ways of Knowing*.

2.3. Digital Literacies in Practice

Moving to the third theme of digital literacies in practice, these articles engage the reader with practices in four different contexts. Watt (2019) shares a two-year, funded, qualitative inquiry on the challenges and possibilities of integrating video production into pre-service teacher education as a critical digital literacy practice. This includes the skills, knowledge, and dispositions that lead to the ability to critique and create digital texts that interrogate the self, the other, and the world. Next Yue, Nekmat and Beta (2019) argues that Southeast Asian youth digital citizenship foregrounds civic participation as emergent acts that not only serve to improve society but also foregrounds new ways of civic-making in Southeast Asian societies. Hagerman (2019) offers a critical review of the designs, impacts, and markers of quality of six literacies interventions, which offers new insights into the strengths and weaknesses of fixed and open approaches to literacies. Finally, Yuan, Wang and Eagle (2019) first define and conceptualize ELL learning, establish a shared vision of digital literacies, and review the literature on how practices of digital literacies empower ELL students to become active learners.

2.4. Digital Skills and Efficacy

In the last theme, digital skills and efficacy, Berger and Wolling's (2019) study investigates factors that associate with teachers' practice of fostering students' digital protective skills. Next, Banzato and Coin (2019) conducted workshops that taught eighteen children about multimodal approaches to narration. The authors concluded that it is possible to positively impact students' self-efficacy about their narrative skills. Finally, Riesmeyer, Hauswald and Mergen (2019) explore how girls receive nutritional advice through Instagram, concluding that there is a positive relationship among media and health literacy, identity, and food-related behaviors.

In summary, authors from four continents (nine countries) make the case that digital literacy has had—and is continuing to have—an impact on contemporary educa-

tion as well as society at large. The authors have inspired new dialogue, research directions, innovative practices, and policy on digital literacies. As digital technologies continue to evolve so too will intellectual frameworks—generating nuance and scope for and by researchers as well as practitioners.

Acknowledgments

Hiller A. Spires would like to thank Cátia Simões and António Vieira in the editorial office of *Media and Communication* for their support. Also, acknowledgment goes to Jessica Eagle, a PhD student at North Carolina State University, for her editorial assistance throughout the process.

Conflict of Interests

The author declares no conflict of interests.

References

Bali, M. (2019). Reimagining digital literacies from a feminist perspective in a postcolonial context. *Media and Communication*, *7*(2), 69–81.

Banzato, M., & Coin, F. (2019). Self-efficacy in multimodal narrative educational activities: Explorative study in a multicultural and multilingual Italian primary school. *Media and Communication*, *7*(2), 148–159.

Berger, M., & Wolling, J. (2019). They need more than technology-equipped schools: Factors associated with teachers' practice of fostering students' digital protective skills. *Media and Communication*, *7*(2), 137–147.

Godhe, A. L. (2019). Digital literacy or digital competence: Conceptualizations in Nordic curricula. *Media and Communication*, *7*(2), 25–35.

Hagerman, M. S. (2019). Digital literacies learning in contexts of development: A critical review of six IDRC-funded interventions 2016–2018. *Media and Communication*, *7*(2), 115–127.

Leaning, M. (2019). An approach to digital literacy through the integration of media and Information literacy. *Media Communication*, *7*(2), 4–13.

Lee, K. M., Park, S., Jang, B. G., & Cho, B. Y. (2019). Multidimensional approaches to examining digital literacies in the contemporary global society. *Media Communication*, *7*(2), 36–46.

Leu, D. J., Forzani, E., Rhoads, C., Maykel, C., Kennedy, C., & Timbrell, N. (2015). The new literacies of online research and comprehension: Rethinking the reading achievement gap. *Reading Research Quarterly*, *50*(1), 37–59.

Lund, A., Furberg, A., & Gudmundsdottir, G. B., (2019). Expanding and embedding digital literacies: Transformative agency in education. *Media and Communication*, *7*(2), 47–58.

Nichols, P., & Stornaiuolo, A. (2019). Assembling "digital literacies": Contingent pasts, possible futures. *Media and Communication*, *7*(2), 14–24.

Pawluczuk, A., Webster, G., Smith, C., & Hall, H. (2019). The social impact of digital youth work: What are we looking for? *Media and Communication*, *7*(2), 59–68.

Riesmeyer, C., Hauswald, J., & Mergen, M. (2019). (Un)healthy behavior? The relationship between media literacy, nutritional behavior, and self representation on Instagram. *Media and Communication*, *7*(2), 160–168.

Spires, H., & Bartlett, M. (2012). *Digital literacies and learning: Designing a path forward* (Friday Institute White Paper Series, No. 5). Raleigh, NC: North Carolina State University. Retrieved from https://www.fi.ncsu.edu/wp-content/uploads/2013/05/digital-literacies-and-learning.pdf

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Watt, D. P. (2019). Video production in elementary teacher education as a critical digital literacy practice. *Media and Communication*, *7*(2), 82–99.

Yuan, C., Wang, L., & Eagle, J. (2019). Empowering English Language Learners students through digital literacies: Research, complexities, and implications. *Media and Communication*, *7*(2), 128–136.

Yue, A., Nekmat, E., & Beta, A. R. (2019). Digital literacy through digital citizenship: Online civic participation and public opinion evaluation of youth minorities in Southeast Asia. *Media and Communication*, *7*(2), 100–114.

About the Author

Hiller A. Spires is an Alumni Distinguished Graduate Professor of Literacy and Technology at North Carolina State University, where she leads the New Literacies & Global Learning program. Dr. Spires studies the integration of emerging technologies in order to illustrate research-based, best practices for digital literacy learning. She is the founding director of The Friday Institute for Educational Innovation. Dr. Spires recently helped create Suzhou North America High School in China and currently serves as honorary principal.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 4–13
DOI: 10.17645/mac.v7i2.1931

Article

An Approach to Digital Literacy through the Integration of Media and Information Literacy

Marcus Leaning

School of Media and Film, University of Winchester, Winchester, SO50 6AT, UK; E-Mail: marcus.leaning@winchester.ac.uk

Submitted: 17 December 2018 | Accepted: 25 January 2019| Published: 11 June 2019

Abstract
Digital literacy often serves as an 'umbrella' term for a range of distinct educational practices which seek to equip the user to function in digitally rich societies. This article explores two of these practices, information literacy and media literacy and through an examination of their histories and practices proposes a future direction for digital literacy. The article consists of three main sections. Section one considers the history of information literacy. The gradual development and refinement of information literacy is traced through a number of key texts and proclamations. Section two is concerned with media literacy. It is noted that media literacy education evolved in three broad strands with each pursuing differing political ends and utilising different techniques. The three approaches are still evident and differences in contemporary media education practices can be understood through this framework. The final section argues that while media and information literacy offer much there are deficiencies in both: media literacy lacks a full engagement with the nature of digital technology and how digital technology affords users new communicative practices while information literacy has not fully developed a critical approach in the way media literacy has. It is asserted that integrating and strategically revisiting both approaches offers a digitally aware and critically nuanced direction for digital literacy.

Keywords
critical digital literacy; digital literacy; history; information literacy; media literacy

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

Digital literacy refers to a broad set of competencies surrounding the use of digital media, computers and Information and Communication Technologies (ICTs). It is often understood to comprise of (or has subsumed) a number of other forms of literacy such a computer literacy, internet literacy, media literacy and information literacy. This article explores two of these component disciplines—information literacy and media literacy—and considers their separate histories. It is argued that in considering how these fields have evolved and can potentially align in the future, it is possible to identify a future, critically orientated direction for digital literacy.

The article commences with a brief consideration of the idea of literacy and then moves to a consideration of the politics of information literacy and identifies a number of key moments in its history. It then turns to media literacy and education. While information literacy has developed in an approximately linear fashion with a common purpose shared by most practitioners, three distinct, historically orientated perspectives can be detected in media education and literacy and these are explored. Finally, the article contends that the two fields need to operate in concert under the auspices of media and information literacy (MIL) and that such an approach can offer a new critically orientated approach to digital literacy.

2. Digital Literacy

The definition of digital literacy has attracted considerable interest. As noted above, the term is generally understood to refer to a set of competencies related

to the skilled use of computers and information technology. Paul Gilster offered a much quoted definition that digital literacy is "the ability to understand information and—more important—to evaluate and integrate information in multiple formats that the computer can deliver" (Gilster as cited in Pool, 1997, p. 6). Further, Gilster's assertion that the focus should be upon "mastering ideas, not keystrokes" (1997, p. 15) separated digital literacy from alternate, technology focused approaches and proved influential in determining the development of the field. Lankshear and Knobel (2006, 2015) specify the meaning further by differentiating between standardized operational approaches (where the emphasis is upon measuring discreate skills associated with the operation of computers and digital media. Jones and Hafner for example assert digital literacy relates to the engaging with the "affordances and constraints" of digital tools (2012, p. 13) and conceptual approaches (where the emphasis is upon developing approaches to the engagement with digital media. For example, Gilster considers digital literacy to relate to "knowledge assembly" (1997, p. 9)). As such digital literacy is considered by many not to be a single activity or set of skills but can be thought of as a range of skills. In light of the variety of foci a number of authors (for example Pangrazio, 2016) call for a reconsideration of digital literacy. One suggested way forward has been to relate digital literacy to the wider topic of literacy itself. Such approaches have sought to utilise a social theory of digital literacy (Bhatt & McKenzie, 2019)—an approach that sees literacy as realised through social practices. As such digital literacy is an aspect of literacy that explicitly considers the "practices through which people make traceable meanings using digital technologies (Gillen & Barton, 2010, p. 1). Such an approach sees literacy as occurring across a range of settings and is developed both within and external to formal education. Buckingham (2003) for example identifies digital media as a further area to which a set of media competencies can be applied. Though such assertions are valuable and important advances in our understanding of literacy as a social and cultural activity they must be balanced with a continuing recognition that new technologies require new forms of understanding. As will be explored, digital literacy is at core a recognition that extant forms of literacy have lacked in their preparation to equip users with the skills to engage with digital technologies as such technologies present new affordances to the user. Linking digital literacy to other forms of literacy as advocates of the social theory of literacy does, relegates the digital aspect. The focus upon the social and the cultural at the expense of the technological fails to recognise the potency of digital technologies. Moreover, it ignores the significant bodies of work that have sought to accommodate and recognise the potency of technology. While the social theory of digital literacy affords a new perspective for the consideration of literacy it plays down the importance of the technological aspects of contemporary communications. Furthermore, in focussing upon the 'content' at the expense of the 'form' of communications, social practice aspects ignore the extensive advances made in the fields information and media literacy in understanding digitality.

3. Being Literate

The equipping students with an ability to read and write in their mother tongue has been one of the central aims of mass education systems since their inception. However by the middle of the 20th century this approach to literacy began to be questioned in a number of ways. First, the interpretation that 'literacy' should refer only to textual understanding was challenged by developments in fields of communication practice other than print. For example, Dale (1946) proposed a new literacy to cover three "modes": print, audio and visual. Similarly, Debes (1968, p. 27) advocated 'visual literacy'—a set of skills to "discriminate and interpret those visible actions, objects, symbols, natural or man-made". Second, there was recognition that the increasing presence of various forms of electronic communication systems and computers from the 1970s resulted in a changed experience of the media for the viewer/user. The consequent call for multimodal literacy (Kress & van Leeuwen, 2001) would allow the user to engage with arrange of different media forms—visual, audio, haptic and virtual reality. Third, a fear of 'falling behind' developing nations in terms of technological competency began to emerge in political discourse in a number of developed countries in the 1960s and 1970s (Belshaw, 2011). One widely proposed solution was the development of 'technological literacy' as a component of education and training programmes. For example, the *Technology for All Americans* paper defined the technologically literate citizen as one who has an "ability to use, manage and understand technology" (International Technology Education Association, 1996, p. 6). Aligned closely with technological literacy a further skills-based approach—computer literacy—also gained strength during the 1980s and 1990s. Many such programs were aligned with the pragmatic skills-based approach (Bawden, 2001, 2008; Lankshear & Knobel, 2006, 2015). Such literacy programs sought (and still seek) to equip a specific group of people with a particular set of skills that will enable them to use computers.

Other literacies which emerged during the late 1980s, 1990s and 2000s included network literacy (Tyner, 1998), internet literacy (Livingstone, 2008), computer literacy (Childers, 2003) and social media literacy (Livingstone, 2014). Moving away from a focus upon a particular technology, Lankshear and Knobel's (2011) work focused upon new literacies and practices which drew upon the affordances of emergent certain social media platforms and collaborative production systems. Such approaches all offered enhancements to the previous understanding of literacy and ran parallel to the emergence of information literacy. While information literacy shared the common purpose of developing skills to deal with digital technology it differed fundamentally in that it looked

to a specific activity rather than to a technology or platform. Information literacy is primarily concerned with the ways in which new technologies make information available and that we possess the skills to deal with information in the range of new forms. It continues and extends the focus of the bibliographic instruction courses that emerged in public libraries (Gibson, 2008) and universities (Rockman, 2004) at the start of the 20th century. As such information literacy should be understood not simply as expert use of technology but as proficiency in the use of information resources of which digital media are a very significant part.

4. The Politics of Information Literacy

A dominant strand in academic literature on information literacy education is that it is an unquestionable social and personal good. Research indicates that being information literate brings benefits for individual students of all ages (Batool & Webber, 2014; Johnston & Webber, 2003). Information literacy brings further benefits at a macro-level as means by which societies transform—Bruce (2004, p. 1) identifies information literacy as "the catalyst required to transform the information society of today into the learning society of tomorrow". Accordingly, information literacy is understood as benefitting both the individual and wider society and as such for the most part escapes critical interrogation (Kapitzke, 2003). Moreover, information literacy education has often been delivered in libraries and information technology departments. Beyond their contribution to education, historically such departments have not been seen as politically charged. Thus information literacy is beyond or devoid of politics. A contributing factor to this is that information education emerged from a technological if not scientific orientation; Webber and Johnston note (2000) note the close link between information literacy and information science. Information literacy has its roots in scientific rather than humanistic discourse and draws upon the technological respectability of science and technology to legitimize its place in curricula. As Escobar et al. (1994) note such practices have often escaped the same degree of scrutiny that is applied to other fields of cultural action.

5. Key Stages in the History of Information Literacy

There have been numerous, extensive and detailed accounts of the history and development of information literacy and the intention here will not be to repeat such accounts but to pick out high points in the development and transition of the field from its origin in the early 1970s to its incorporation in the Media and Information Literacy Curriculum proposed by UNESCO in 2011 which is in current use at the time of writing.

The term information literacy was first used by Paul Zurkowski in a 1974 report to the US National Commission on Libraries and Information Science on the future organization priorities. Zurkowski contended that: "people trained in the application of information resources to their work can be called information literate....The work of the Commission should be viewed in terms of achieving total information literacy for the nation" (1974, pp. 6–8). As Whitworth (2014) notes, Zurkowski's definition does not develop the idea in any pedagogically useful way and situates it within a pro-liberal, managerial position identifying and advocating an environment for economic development. Following Zurkowski's work, Burchinal (1976) is considered to have advanced the field further by shifting attention to the educational aspects of information literacy (Pinto, Cordón, & Gómez Díaz, 2010; Whitworth, 2014). Burchinal develops the idea that an information literate person possesses specific skills—specifically they are able to "efficiently and effectively locate and use information needed for problem-solving and decision-making" (1976, p. 11). Whitworth (2014) notes that while continuing the broadly liberal approach, Burchinal's work shifts the focus to instruction—or more precisely education.

This approach was challenged by Hamelink (1976) who used the critical educational theories of Paolo Freire (2000) to interpret information literacy as a device with which the "cognitive costs" of contemporary society can be mitigated (Whitworth, 2014). Unfortunately, the development of such an anti-systemic, critical aspect of information literacy—an approach that constructs information literacy as something that can aid individuals rather than simply affording economic advantage to society as a whole—was not widely developed.

Perhaps the next major advance was the publication in the USA of the *Presidential Committee on Information Literacy: Final Report* published by the American Library Association (American Library Association [ALA], 1989). This report sought to address a concern that that US schooling lacked in developing key skills and that the US was falling behind other industrialized countries and (more problematically) developing countries would soon overtake it. A solution for such problems lays in advancing the information skills of students (Plotnick, 1999). The Report identifies a five-step process (knowing when we need information, identifying what information is needed, finding the information and evaluating it, organizing the information and using the information) to engage with information and sought to embed this in schools. A number of programmes emerged around this time and while the ALA's model was not very innovatory (similar programmes such as Eisenberg and Berkowitz's "Big6 system" (1990) also offered a granular approach) the support from the professional library community gave the final report significant credibility and resulted in the 1989 proposal by the National Forum on Information Literacy (NFIL) that information literacy become a part of main stream school education. The NFIL's report also offered a revised definition of information literacy—"the ability to access, evaluate and use information from a variety of sources" (Doyle, 1992, p. 2)—and

identified ten discrete attributes of an information literate person.

There was also significant work on information literacy occurring outside of the USA. Bruce from Griffith's University in Australia produced the "Information Literacy Blueprint" (1994) which identified seven attributes of the information literate. This was further developed by Bruce (1997) with a phenomenological approach that challenged the overt behaviourist perspective which had previously dominated the field and marked a shift in how information literacy was understood and taught. A key text produced by the UK's Society of College, National and University Libraries (SCONUL) extended the key skills of the information literate person to include an ability to 'create' (Bent & Stubbings, 2011). This was an important development and recognises the productive as well as the consumptive potential in digital media.

The growth in the numbers of those coming online—by 2017 more than 80% of the population are online in over 100 countries (Sanou, 2017)—and their educational diversity drove a further revision. Information literacy became to be seen as a vital skill for those not just within the higher education sector but across wider society. International organisations, such as the United Nations Educational, Scientific and Cultural Organisation (UNESCO) coupled with international engagement by national organisations such as the US National Commission on Library and Information Science and the NFIL, sought to address such concerns at the 2003 meeting of experts in Prague. This meeting produced a revised interpretation of information literacy defining it as the ability to:

> Identify, locate, evaluate, organize and effectively create, use and communicate information to address issues or problems at hand; it is a prerequisite for participating effectively in the Information Society, and is part of the basic human right of life-long learning. (UNESCO, 2003, p. 1)

The United Nations World Summit on the Information Society, which took place in Geneva in 2003 and Tunis in 2005, resulted in further description of information literacy. The Alexander Proclamation of the High Level Colloquium on Information Literacy and Lifelong Learning in 2005 determined that information literacy "lies at the core of lifelong learning. It empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals" (Garner, 2006, p. 3).

The simplified definition concatenates the multistage complexity of the activity in previous texts with the initial stages of recognizing a need for information being sublimated into seeking information. This reduction in the number of steps raises the comparative importance of the creative aspect. Furthermore, information literacy is regarded as an activity that 'empowers' people—it affords people the opportunity to avail themselves of information they could not get if they lacked a grounding in information literacy education. Such incorporation of the ideas of equality, rights and justice within information literacy situate it as a public 'good', information literacy is exists to advance the interest of people. As such the beneficiary of this is not the economic wealth of the nation—as was identified by Whitworth (2014) in Zurkowski's (1974) work. Instead information literacy is understood as conferring a benefit to the individual. While economic activity is still a valuable result, the foregrounded benefit is primarily one of equality and social justice.

From the mid-to-late 2000s and 2010s information literacy has begun to overlap with aspects of media literacy in terms of its content, practices and foci and there is now a strong movement towards integrating the two practices. For example, Livingstone (2008, p. 107) argues that in order to equip people "a convergence of media (or audiovisual) and information literacies is needed". Similarly Leaning (2014, 2017) proposes a fundamental integration of the fields. One example of this approach is the 2011 UNESCO's "Media and Information Literacy Curriculum for Teachers" (Wilson, Grizzle, Tuazon, Akyempong, & Cheung, 2011). This curriculum offers an educational framework for the development of skills in MIL in teacher education programmes. The text establishes a direct link between MIL and democracy and overtly supports democratic practices such as the peer-communication of information between citizens. While the project is admirable in its scope it is fundamentally a media literacy project with information literacy aspects appended. It does not deal deeply enough with the digital nature of information nor fully recognise key aspects of contemporary digital culture and the use of data by organisations (Leaning, 2017).

6. Media Literacy

While the UNESCO MIL Curriculum articulated only a partial engagement with information literacy it also offered a specific perspective on media literacy. Historically media literacy has been used to describe a range of educational practices. Potter (2010) recognises that over 20 different definitions are in use and that there is little consensus or fixed meaning. Organisations such as the National Leadership Conference on Media Literacy (Aufderheide, 1993), the UK's Office of Communication (OFCOM, 2004) and the US based National Association for Media Literacy Education (National Association for Media Literacy Education, 2015) all offer definitions which identify a range of specific skills that a media literate person would possess. An alternative to these skills-based methods lies in an approach that looks to developing criticality in students (Silverblatt & Eliceiri, 1997) and regards media literacy as a social and cultural practice (Sholle & Denski, 1994). This draws upon the academic field of media studies and constructs media literacy as being able to critically engage with the media. Such approaches make use of the interpretative epistemologies found in the arts,

humanities and social sciences as opposed to the science and technologically oriented epistemology underpinning information studies and by derivation information literacy. A number of commentators have identified distinct periods and related theoretical perspectives within this general critical tradition (Buckingham, 2003; Leaning, 2017; Masterman, 1997). While these three perspectives emerged in different historical periods they are all still evident in various contemporary media education programmes.

6.1. The Protectionist or Inoculation Model

The protectionist or inoculation approach is founded upon two fundamental but often unvoiced assumptions: first that media or technology can have a detrimental impact upon those who consume it. This occurs in a number of ways: it may change the values and sensibilities of a society as a whole; the media may directly impact upon the wellbeing of an individual; or the media may cause an individual to have a negative impact upon third parties. Second, there are various practices and educational techniques that can be used to negate the impact upon individuals and society—the audience can be inoculated against the media (Buckingham, 2003). This model of media education has the function of providing these practices and techniques and the resultant media literate person is 'immunised' against the negative aspects of the media.

There are many examples of the first assumption throughout the history of media technology; perhaps the first recorded example can be found in Plato's *Phaedrus* (Jowett, 1892, p. 77) where writing is considered problematic as: "this discovery of yours will create forgetfulness in the learners' souls, because they will not use their memories". The fear re-emerges with the invention of the printing press which drove Trithemius of Sponheim to comment "printing is no genuine friend of Holy Scripture" (Clark, 2004, p. 72). Similar concerns were raised by the philosopher Leibniz that feared the printing press would lead to the eventual elimination of scholarly arts (Klancher, 2013).

However, the origin of media education lies in the response to fears of the mass-media in late 19th and early 20th century and the emergence of a widespread, popular culture which was often blamed for many social ills. In particular, critics were explicitly concerned with the impact media would have upon the untutored minds of children and the working classes (Murdoch, 1997).

Alongside the increased newspaper circulation in the early part of the 20th century, technological advances resulted in the emergence of other mass-media forms including the phonograph, cinema, radio and television. Responses to these new media were varied; in the UK and other Western European countries a central concern was that such mass-media would result in the spread of 'alien' (read American) popular culture. Such culture was considered less intellectually demanding compared to the native 'high culture' studied in a classical European education. Accordingly, educational activities were developed to limit the negative impacts with the aim being to teach the audience to be able to discern good from bad (Masterman, 1997). The approach drew upon the literary theories of Leavis (Leavis & Thompson, 1933) and the Modernist tradition of literary criticism and continued the Arnoldian understanding that study should focus upon high cultural texts (Arnold, 1869).

A further strand of the protectionist and defensive stance is found within the contemporaneous yet overtly Marxist work of the Frankfurt School. In this approach mass culture is understood as being central in the 'culture industry'—the means by which a working class consciousness is prevented from forming (Bennett, 1982). Mass or popular culture must be resisted as it restricts the development of awareness of class position. In spite of the radically different political agendas of the two approaches both see a common goal in resisting popular culture. Accordingly, the aim of media education is to protect the reader/viewer from the damaging impact of mass-media, to equip them with what Masterman (1997, p. 20) defines as "education *against* the media" (italics in original).

Despite its age (it was first developed in the 1930s) the approach is still very popular. For example, it is much in evidence in the discourses and practices of "Digital Detox" in which users willingly disengage with digital media for a period of time (Brabazon, 2012).

6.2. The Demystification Model

An alternate approach to media education emerged during the 1960s and by the 1980s had become the dominant academic approach in many Western countries. Drawing upon developments in various fields associated with what became known as the 'cultural' or 'linguistic' turn (the recognition of culture in explanations of human life) media educators changed the focus of their activities and rather than seeking to protect the audience now sought to empower them against problematic aspects of the media. This view identifies media content as inherently ideological—the media plays a significant role in justifying power relations to those who are most subjected to them. Accordingly, the task of media education is to make known to the audience the ideological function and methods used by the media, to 'demystify' the media to its audience (Penman & Turnbull, 2007). The audience will then 'awaken' to this power and develop 'conscious awareness'.

The development of this approach stems from advances in theories of semiotics and ideology made in the early 1970s (Masterman, 1997). Advances in the understanding of ideology following the publication in 1971 of Gramsci's *Prison Notebooks* (Gramsci, Hoare, & Nowell-Smith, 1971) by Hall and others (Centre for Contemporary Cultural Studies, 2007) and later Laclau, Moufee and Zizek in the field of discourse analysis (Torfing, 1999) re-

sulted in a critique that understands ideology as present in all cultural life and continually reproduced by actors rather than being disseminated from the top by an elite. Semiotics also made major contributions to media education. The work of Barthes' (1972) is understood to have made two major contributions. First, that the media can never directly present the world to us; it can only ever offer to re-present it. The media is not a transparent lens and always mediate how we see the world. As a consequence we need to study the nature of representation in the media. Second, Barthes explicitly challenged the arbitrary distinction between high and low culture. Barthes' work contributed to a broadly left-wing class-based model of analysis that opposed the value laden conservative model of cultural appreciation which was present in the Leavisite, protectionist model.

The deployment of these practices within media education resulted in an approach that sought to empower the audience and was subsequently recognised as a form of what Kellner terms 'critical literacy' (2000). The critical aspect allows teaching to be seen as an activity that empowers students in the face of ideological forces and bestows teaching with a political function. It is still popular in many areas of media education and indeed underpins a number of contemporary media education projects such as UNESCO's MIL CLICKS campaign of information graphics (or info-graphics) that are circulated through social media. These info-graphics advocate the practices of critical literacy and alert readers to issues such as fake news and propaganda amongst others.

However, the critical approach has also been subject to criticism which draws upon earlier Leavisite ideals of culture and are consequently opposed to the idea that popular culture should be studied. A further critique of this approach to media education is that it fails to develop employment related skills. Students who take such media literacy courses are not trained in techniques that enable them to produce media content.

6.3. The Creative Participation Model

From the early 1990s a third approach termed the participatory or creative model incorporated developments in constructivist theory. Constructivism's roots lay in developments in psychology and pedagogy concerning the way in which learning occurs arguing that knowledge is acquired through a process of construction of knowledge in the learner's mind. Furthermore, the best way to ensure this occurs is to have the learner engage in creative and productive activities, to make a shift from a position in which knowledge is considered a discreet unit to one in which learning or knowing is seen as a process (Jones & Brader-Araje, 2002). To attend to this constructivism makes use of a range of alternative methods and teaching practices to the deconstruction of texts used in the demystification model. Typical methods used within a creative/participatory framework include: project work, collaborative media text production, group work, practice by doing, structured discussion, getting students to teach each other, discovery and research work and a variety of other methods (Fernback, 2014).

In addition to this shift in general pedagogic approaches, three other developments had a significant impact upon the current shape of media education. First, the emergence then the widespread diffusion of digital technology and the impact upon the way in which media content is encountered. Second is the related change in the way audiences and media consumption are conceptualised. Buckingham (1998) notes how advances in psychology and cultural studies result in the idea of a passive audience being strongly challenged. The idea that a single homogeneous audience will receive a media text in a singular manner has been heavily criticised. In its place researchers talk of audiences who are active in the engagement with media texts. The resultant approach to media education is one in which participation and active engagement in the production of media texts play a significant role. Indeed, there has been a conscious attempt to move beyond the notion of a single author of a text and towards recognition that media content production is an inherently collaborative endeavour (Jenkins, 2009). However the extent of this treatment often tends to be rather limited. In numerous examples the analysis tends to be restricted and focused upon the extent of individual or group contribution while ignoring the impact of technological affordances and how technology plays a significant role in structuring the nature of production (Leaning, 2017).

Third, Gauntlet (2013) notes a contemporary a trend in the domestic manufacture of goods and texts. This 'maker' culture involves people in productive practices across a range of fields some traditional such as textiles and ceramics and in contemporary digital realms of production. Such a movement is both contributory to and beneficial of creative production approaches to media education.

At the time of writing the creative/participatory approach to media education is undoubtedly dominant. Its broad attention to creative and yet critical examination of media texts from a broad range of media forms allows it to inform both the critical analytic side of media studies while also being useful to the technical and industry salient areas of media training. Thus it serves as pedagogy that meets both the critical concerns of media educators and also the skills agenda of the industry advocates who challenged the demystification approach so strongly.

7. Conclusion: Aligning Media and Information and the Value of Recognition

This article has offered brief accounts of the history and development of the fields of information literacy and media literacy. It is argued that considering the history of educational fields has a number of distinct benefits and is valuable to the future direction of digital literacy in two

main ways. First, in considering the history of fields it is possible to discern the main points of difference, similarity and overlap. Reviewing information and media literacy side by side reveals opportunities for integration that will allow educational practitioners to address the problems considered by information and media literacy and digital literacy from outside of the silo mentality that currently exists in which digital, information and media literacy exist as separate and distinct fields (Casey & Brayton, 2017). This is not an argument that one field should 'colonise' another, rather that the fields, under the broad remit of digital literacy, address similar issues and combining them aids both in addressing weaknesses. Information literacy has a long history of driving users to be more skilled in their use of information and digital media. Its emphasis has been upon the manner in which information is engaged with by the user. However, in reflecting its originating discourse of information studies and its political orientation of serving a notional public good it often fails to afford a critical position. The emphasis of information literacy is to empower the user in their use of ICTs rather than to develop meta-critical skills. When information literacy does address critical skills these often tend to be those that can be used to assure the validity of process such as triangulating information and checking sources are appropriate. What information literacy does not as yet do is develop a more critically orientated perspective in terms of analysis. It does not draw upon any of the meta-critical traditions that have evolved within the humanities and social sciences for examining text and lacks the anti-conservative or progressive critical stance that informs media literacy (Kellner, 2000; Sholle & Denski, 1994; Silverblatt & Eliceiri, 1997).

Media literacy on the other hand has a long tradition of drawing upon the critical practices in the arts, humanities and social sciences. Much of the critical emphasis in all three approaches noted above make extensive call upon the study of cultural texts. However media literacy's approach often falls short of addressing the more technological aspects of media. Media literacy evolved and developed to engage with mass media; its focus, research methods and understanding of the impact of media evolved from an engagement with mass and broadcast media and its mode of analysis towards digital media often reflect an understanding of mass and broadcast media (Merrin, 2014). While offering high level critical skills media education for the most part does not possess techniques and understanding compatible with digital information. While some emphasis is placed upon the study of audiences within the Creative Participation model, the impact of technology and how it is used is often down played or missed (Leaning, 2017).

Second, in considering the history and practices of information and media literacy it is possible to discern the impact of technology through the educational practices developed to accommodate, engage with and mitigate the negative aspects of it. As explored above one of the key impulses for information literacy education was a perception that without developing key skills in technology (computers in particular), countries such as the US risked falling behind competitor countries in the developed and developing world. The protectionist approach to media literacy is similarly underpinned by a fear of media technology. However this is a fear of the technology and its cultural impact rather than not being adequate in the use of the technology. This understanding is important as it identifies the drive for digital literacy as originating in perceptions of problems and difficulties faced by individuals and society. Thus information and media literacy can be understood to have their origins in attempts to deal with technology. This interpretation perhaps mitigates the charge made by advocates of the "social theory of literacy" (Bhatt & MacKenzie, 2019; Gourlay & Oliver, 2018) that such disciplines neglect the social practices of users in lieu of understanding use through metrics. Instead it is argued that the history of information and media literacy indicates that approaches to engaging with digital media (either to acquire the skills for their user to defend or mitigate their impact) emerge from the experience of users and the fears that social practices are under threat. Recognizing the history of information and media literacy affords an understanding of such as contributory to the current practices of digital literacy; what practitioners did in the past should be considered rather than regarded as erroneous.

Accordingly it is asserted that those planning the future direction of digital literacy should be mindful of its past and the past of the constituent disciplines. Such awareness will equip us with an understanding that new synergies and assemblages of extant academic fields can benefit digital literacy and that digital literacy should be regarded as a means by which social practices and digital media can be more meaningfully understood.

Conflict of Interests

The author declares no conflict of interests.

References

American Library Association. (1989). *American Library Association presidential committee on information literacy: Final report*. Washington, DC: American Library Association.

Arnold, M. (1869). *Culture and anarchy: An essay in political and social criticism*. London: Smith, Elder & Company.

Aufderheide, P. (1993). *Media literacy. A report of the national leadership conference on media literacy*. Washington, DC: ERIC.

Barthes, R., & Lavers, A. (1972). *Mythologies*. New York, NY: Hill and Wang.

Batool, S., & Webber, S. (2014). Early findings from a study of information literacy practices in primary schools of pakistan. In S. Kurbanoğlu, S. Špiranec, E. Grassian, D. Mizrachi, & R. Catts (Eds.), *Informa-*

tion literacy. Lifelong learning and digital citizenship in the 21st century (pp. 282–290). Basel: Springer International.

Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of Documentation*, *57*(2), 218–259.

Bawden, D. (2008). Origins and conepts of digital literacy. In C. Lankshear & M. Knobel (Eds.), *Digital literacies: concepts, policies and practices* (pp. 17–32). New York, NY: Peter Lang.

Belshaw, D. (2011). *What is digital literacy? A Pragmatic investigation* (Unpublished doctoral dissertation). Durham University, Durham, UK.

Bennett, T. (1982). Theories of media, theories of society. In M. Gurevitch (Ed.), *Culture, society and the media*. London: Methuen.

Bent, M., & Stubbings, R. (2011). *The SCONUL seven pillars of information literacy. Core model for higher education*. London: SCONUL.

Bhatt, I., & Mackenzie, A. (2019). Just Google it! Digital literacy and the epistemology of ignorance. *Teaching in Higher Education*, *24*(3), 302–317.

Brabazon, T. (2012). Time for a digital detox? From information obesity to digital dieting. *Fast Capitalism*. Retrieved from http://www.uta.edu/huma/agger/fastcapitalism/9_1/brabazon9_1.html

Bruce, C. (1994). *Information literacy blueprint* (Unpublished). Retrieved from http://www.academia.edu/2463291/Information_literacy_blueprint

Bruce, C. (1997). *The seven faces of information literacy*. Blackwood: Auslib Press.

Bruce, C. (2004). *Information literacy as a catalyst for educational change. A background paper*. Paper presented at The 3rd international lifelong learning conference, Yeppoon, Queensland, Australia.

Buckingham, D. (1998). Media education in the UK: Moving beyond protectionism. *Journal of Communication*, *48*(1), 33–43.

Buckingham, D. (2003). *Media education: Literacy, learning and contemporary culture*. Cambridge: Polity Press.

Burchinal, L. (1976). *The communications revolution: America's third century challenge*. Paper presented at The future of organizing knowledge, Texas A & M university library's centennial academic assembly, College Station, Texas.

Casey, N., & Brayton, S. (2017). *No silos—In defense of media & information literacy: A mini-manifesto?* Retrieved from http://www.natashacasey.com/single-post/2017/03/14/In-Defense-of-Media-Information-Literacy-A-Mini-Manifesto

Centre for Contemporary Cultural Studies. (2007). *On ideology*. Abingdon: Taylor & Francis.

Childers, S. (2003). Computer literacy: Necessity or buzzword? *Information Technology and Libraries*, *22*(3), 100–104.

Clark, J. (2004). Print and pre-reformation religion: The Benedictines and the press, c.1470–c.1550. In J. Crick & A. Walsham (Eds.), *The uses of script and print, 1300–1700* (pp. 74–93). Cambridge: Cambridge University Press.

Dale, E. (1946). *Audiovisual methods in teaching*. New York, NY: Holt, Rineheart and Winston.

Debes, J. (1968). Some foundations of visual literacy. *Audio Visual Instruction*, *13*, 961–964.

Doyle, C. S. (1992). *Outcome measures for information literacy within the national education goals of 1990*. Final report to national forum on information literacy. Summary of findings. Washington, DC: ERIC.

Eisenberg, M. B., & Berkowitz, R. E. (1990). *Information problem solving: The big six skills approach to library & information skills instruction*. Washington, DC: ERIC.

Escobar, A., Hess, D., Licha, I., Sibley, W., Strathern, M., & Sutz, J. (1994). Welcome to cyberia: Notes on the anthropology of cyberculture [and comments and reply]. *Current Anthropology*, *35*(3), 211–231.

Fernback, J. (2014). *Teaching communication and media studies: Pedagogy and practice*. Abingdon: Taylor & Francis.

Freire, P. (2000). *Pedagogy of the oppressed*. New York, NY: Continuum.

Garner, S. D. (2006). *High-level colloquium on information literacy and lifelong learning*. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000144820

Gauntlett, D. (2013). *Making is connecting*. Cambridge: Wiley.

Gibson, C. (2008). The history of information literacy. In C. Cox & E. Lindsey (Eds.), *Information literacy instructional handbook* (pp. 10–25). Chicago, IL: ACRL.

Gillen, J., & Barton, D. (2010). *Digital literacies: A research briefing by the technology enhanced learning phase of the teaching and learning research programme*. London: TLRP

Gilster, P. (1997). *Digital literacy*. New York, NY: Wiley.

Gourlay, L., & Oliver, M. (2018). *Student engagement in the digital university: Sociomaterial asemblages*. New York, NY: Taylor and Francis.

Gramsci, A., Hoare, Q., & Nowell-Smith, G. (1971). *Selections from the prison notebooks of Antonio Gramsci*. London: International Publishers.

Hamelink, C. (1976). An alternative to news. *Journal of Communication*, *26*(4), 120–123.

International Technology Education Association. (1996). *Technology for all Americans*. Reston, VA: International Technology Education Association. Retrieved from https://scholar.lib.vt.edu/TAA/Taa_tech.pdf

Jenkins, H. (2009). *Convergence culture*. New York, NY: New York University Press.

Johnston, B., & Webber, S. (2003). Information literacy in higher education: A review and case study. *Studies in Higher Education*, *28*(3), 335–352.

Jones, G., & Brader-Araje, L. (2002). The impact of constructivism on education: Language, discourse, and meaning. *American Communication Journal*, *5*(2), 1–10.

Jones, R. H., & Hafner, C. A. (2012). *Understanding digital literacies*. London and New York: Routledge.
Jowett, B. (1892). *The dialogues of Plato in five volumes* (3rd ed.). Oxford: Oxford University.
Kapitzke, C. (2003). Information literacy: A positivist epistemology and a politics of outformation. *Educational theory*, *53*(1), 37–53.
Kellner, D. (2000). Multiple literacies and critical pedagogies: New paradigms. In P. P. Trifonas (Ed.), Revolutionary pedagogies. *Cultural politics, instituting education, and the discourse of theory* (pp. 196–221). London and New York: Taylor & Francis.
Klancher, J. (2013). *Transfiguring the arts and sciences: Knowledge and cultural institutions in the romantic age*. Cambridge: Cambridge University Press.
Kress, G., & van Leeuwen, T. (2001). *Multimodal discourse: The modes and media of contemporary communication*. Oxford: Oxford University Press.
Lankshear, C., & Knobel, M. (2006). Digital literacies: Policy, pedagogy and research considerations for education. *Digital Kompetanse: Nordic Journal of Digital Literacy*, *1*(1), 12–24.
Lankshear, C, & Knobel, M. (2011). *New literacies: Everyday practices and social learning* (3rd ed.). Maidenhead: Open University Press.
Lankshear, C., Knobel, M. (2015). Digital literacy and digital literacies: Policy, pedagogy and research considerations for education. *Digital Kompetanse: Nordic Journal of Digital Literacy*, *10*, 8–20.
Leaning, M. (2014). Towards the integration of media and information literacy: A rationale for a 21st century approach. In P. Mihailidis & B. De Abreu (Eds.), *Media literacy education in action: Theoretical and pedagogical perspectives*. Oxford: Routledge.
Leaning, M. (2017). *Media and information literacy: An integrated approach for the 21st century*. Oxford: Elsevier.
Leavis, F. R., & Thompson, D. (1933). *Culture and environment: The training of critical awareness*. London: Chatto & Windus.
Livingstone, S. (2008). Internet literacy: Young people's negotiation of new online opportunities. In T. McPherson (Ed.), *Digital youth, innovation, and the unexpected* (pp. 101–122). Cambridge, MA: MIT Press.
Livingstone, S. (2014). Developing social media literacy: How children learn to interpret risky opportunities on social network sites. *Communications*, *39*(3), 283–303.
Masterman, L. (1997). A rationale for media education. In R. Kubey (Ed.), *Media literacy in the information age* (pp. 15–78). New Brunswick: Transaction Publishers.
Merrin, W. (2014). *Media studies 2.0*. Oxford: Routledge.
Murdoch, G. (1997). Reservoirs of dogma: An archaeology of popular anxiety. In M. Barker & J. Petley (Eds.), *Ill effects: The media violence debate*. London: Routledge.
National Association for Media Literacy Education. (2015). *Media literacy definition*. Retrieved from https://namle.net/publications/media-literacy-definitions
OFCOM. (2004). *Strategies and priorities for the promotion of media literacy: A statement*. London: Office of Communicatins.
Pangrazio, L. (2016) Reconceptualising critical digital literacy. *Discourse: Studies in the Cultural Politics of Education*, *37*(2), 163–174.
Penman, R., & Turnbull, S. (2007). *Media literacy: Concepts, research and regulatory issues*. Melbourne: Australian Communications and Media Authority.
Pinto, M., Cordón, J. A., & Gómez Díaz, R. (2010). Thirty years of information literacy (1977–2007): A terminological, conceptual and statistical analysis. *Journal of Librarianship and Information Science*, *42*(1), 3–19.
Plotnick, E. (1999). Information literacy. *Eric Digests*. Retrieved from http://www.ericdigests.org/1999-4/information.htm
Pool, C. (1997). A conversation with Paul Gilster. *Educational Leadership*, *55*(3), 6–11.
Potter, W. J. (2010). The state of media literacy. *Journal of Broadcasting & Electronic Media*, *54*(4), 675–696.
Rockman, I. F. (2004). *Integrating information literacy into the higher education curriculum. Practical models for transformation*. San Francisco, CA: Jossey-Bass.
Sanou, B. (2017). *ICT facts and figures 2017*. Geneva: ICT.
Sholle, D., & Denski, S. (1994). *Media education and the (re)production of culture*. Westport, CT: Bergin & Garvey.
Silverblatt, A., & Eliceiri, E. M. E. (1997). *Dictionary of media literacy*. Westport, CT: Greenwood Press.
Torfing, J. (1999). *New theories of discourse: Laclau, Mouffe and Zizek*. London: Wiley.
Tyner, K. (1998). *Literacy in a digital world*. Mahwah, NJ: Lawrence Erlbaum Associates.
UNESCO. (2003). *The Prague declaration*. Towards an information literate society. Paris: UNESCO. Retrieved from http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/pdf/PragueDeclaration.pdf
Webber, S., & Johnston, B. (2000). Conceptions of information literacy: New perspectives and implications. *Journal of Information Science*, *26*(6), 381–397.
Whitworth, A. (2014). *Radical information literacy: Reclaiming the political heart of the IL movement*. Oxford: Elsevier Science.
Wilson, C., Grizzle, A., Tuazon, R., Akyempong, K., & Cheung, C. (2011). *Media and information literacy curriculum for teachers*. Paris: UNESCO.
Zurkowski, P. G. (1974). *The information service environment relationships and priorities* (Related Paper No. 5). Washington, DC: National Commission on Libraries and Information Science.

About the Author

Marcus Leaning is Professor of Digital Media Education at the University of Winchester in the United Kingdom. He holds a PhD in Media Sociology, is the author or editor of seven books, has written numerous journal articles and chapters and has given academic papers in over 30 countries. He is a Fellow of the Royal Society for the Arts, a Senior Fellow of the Higher Education Academy and a National Teaching Fellow.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 14–24
DOI: 10.17645/mac.v7i2.1946

Article

Assembling "Digital Literacies": Contingent Pasts, Possible Futures

T. Philip Nichols [1,*] and Amy Stornaiuolo [2]

[1] Curriculum and Instruction, Baylor University, Waco, TX 76798, USA; E-Mail: phil_nichols@baylor.edu
[2] Literacy, Culture, and International Education, University of Pennsylvania, Philadelphia, PA 19104, USA; E-Mail: amystorn@upenn.edu

* Corresponding author

Submitted: 22 December 2018 | Accepted: 7 February 2019 | Published: 11 June 2019

Abstract
In this article, we examine the historical emergence of the concept of "digital literacy" in education to consider how key insights from its past might be of use in addressing the ethical and political challenges now being raised by connective media and mobile technologies. While contemporary uses of digital literacy are broadly associated with access, evaluation, curation, and production of information in digital environments, we trace the concept's genealogy to a time before this tentative agreement was reached—when diverse scholarly lineages (e.g., computer literacy, information literacy, media literacy) were competing to shape the educational agenda for emerging communication technologies. Using assemblage theory, we map those meanings that have persisted in our present articulations of digital literacy, as well as those that were abandoned along the way. We demonstrate that our inherited conceptions of digital literacy have prioritized the interplay of users, devices, and content over earlier concerns about technical infrastructures and socio-economic relations. This legacy, we argue, contributes to digital literacy's inadequacies in addressing contemporary dilemmas related to surveillance, control, and profit motives in connective environments. We propose a multidimensional framework for understanding digital literacies that works to reintegrate some of these earlier concerns and conclude by considering how such an orientation might open pathways for education research and practice.

Keywords
digital literacy; information literacy; literacies; media literacy; new literacies

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

Digital literacy has now entered common parlance in education research, policy, and practice. Calls for inquiry into its associated activities and its place in pedagogical transactions abound (Hicks & Turner, 2013; Lankshear & Knobel, 2008). Yet, for its resonance in the field, the term's meaning remains stubbornly nebulous. Broadly associated with the access, evaluation, curation, and production of information in digital environments, the phrase is used to index a range of scholarly projects: from studies of screen-based reading comprehension (Coiro, 2003; Leu & Kinzer, 2000) to accounts of youth media practices (Haddix & Sealey-Ruiz, 2012; Ito et al., 2013) to applications of critical theory in the creation and consumption of digital artifacts (Ávila & Pandya, 2012; Morrell, 2012). Current contexts of participatory media (Jenkins, Ford, & Green, 2013) use the phrase in its plural form, "digital literacies," to reflect the multiplicity of situated social practices that are mediated through digital technologies (Pahl & Rowsell, 2010). Taken together, these diverse meanings have allowed the term to circulate widely, leading to what some have called the "digital turn" in literacy studies (Mills, 2010). However, in consolidating such diverse trajectories under the banner of "digital literacy," at times the phrase can

paper over differences and contradictions within and across its uses. These tensions are only further compounded as the contours of our digital ecosystem continue to evolve with the proliferation of connective and mobile technologies.

In this article, we examine the historical emergence of digital literacy in education to suggest that insights from its past can be of use not only in clarifying its present configurations but also in addressing the ethical and political challenges surfacing with contemporary connective media. To do so, we begin by tracing the genealogy of digital literacy from a time before the term found popular uptake, when diverse scholarly lineages were still competing to shape an educational agenda for new computer technologies. We suggest that digital literacy was not an inevitable successor to these traditions but a contingent assemblage that braided together certain concerns from the past while abandoning others. We argue that this assemblage has conditioned our inherited models of digital literacy—those that are now straining to accommodate, much less explicate, the technical and economic infrastructures that underwrite digital practices. Drawing on resources from the term's longer histories and the work of contemporary media theorists (e.g., Berry, 2011; van Dijck, 2013), we propose an expanded framework for mapping the multidimensional terrain of digital literacy—one that brings a socio-historical orientation to bear on the material and economic realities of digital practice. We conclude by considering how this multidimensional view might be put to work in education research and practice.

2. Contingent Histories of "Digital Literacy"

In the mid-1990s, before digital literacy had found its way into common usage, there was already a growing sense among literacy researchers that the shifting technological landscape was reshaping the demands of reading and writing. In a 1994 keynote address to the National Reading Conference, David Reinking argued that computers were ushering in a "post-typographic world"—one that would require new theories and methods for teaching and learning. "Evolving forms of electronic reading and writing," he said, "point to fundamental changes in the way we communicate and disseminate information, the way we approach reading and writing, and the way we think about helping people become literate." In just a few years, Reinking and others in the field would be using the phrase "digital literacy" to bind these challenges together as a coherent scholarly project (Labbo, Reinking, & McKenna, 1998; cf. Bawden, 2008); however, at the time, in the absence of such a framework, scholars looked instead to existing traditions in technology education to elucidate paths forward in the "post-typographic" age (cf. Baker & Luke, 1991; Hawisher, LeBlanc, Moran, & Selfe, 1996). Most prominent among these were computer literacy, information literacy, and media literacy.

2.1. Computer Literacy

Computer literacy had existed in some form since the 1970s, albeit with variations in its usage. One of the earliest government-funded surveys of the concept began by stating, "Computer literacy is a term that has been widely discussed, but whose meaning has rarely been agreed upon" (Lockheed et al., 1983, p. 12). Through the 1980s, two competing—though, at times, allied—approaches to computer literacy began to emerge. The first focused on uses of computer technologies. Moursund (1982), for example, suggested that elementary and secondary students ought to have practical knowledge about computers and their applications to life and work. Luehrmann (1982) articulated this view more colloquially, saying, "If you can tell the computer how to do things you want it to do, you are computer literate." This orientation could include attention to hardware or programming, but it largely centered on the non-technical aspects of computer-use. The second approach, by contrast, was concerned with control of computer technologies. Papert (1980) famously suggested that children who could not program computers were at risk of being programmed by them. At the MIT Media Lab, he and his colleagues developed the LOGO programming language to support students in communicating with and manipulating computer environments. While both approaches coexisted into the 1990s, advocates of the latter became frustrated with the steady proliferation of the former in school settings. Papert (1992) accused use-driven orientations to computer literacy with redefining the term to mean "a very minimal practical knowledge about computers" and suggested "someone who had so minimal a level of knowledge of reading, writing, and literature would be called illiterate" (p. 52).

Importantly, as computers were integrated into school contexts throughout the 1980s, a third dimension to computer literacy also emerged—one focused on the politics and economics of computing systems. In a wide-ranging critique, titled "Computer Literacy and Ideology," Noble (1984) argued that the ambiguities in the term were actually strategic, leveraging anodyne appeals to "preparing students for future work" or "empowering students to program" to advance a particular ideology. For Noble (1984), the use-oriented approach to computer literacy was rooted in technological determinism: by presupposing the inevitability of a computer-driven future, it not only created a sense of urgency for bringing computers into schools, but in doing so, accelerated a new credentials race, where computer-knowledge became a form of capital that could be shored up by or withheld from individuals to reinforce already-existing social hierarchies. Similarly, Noble argued that control-oriented approaches to computer literacy actually manifested a form of "pseudo-control"—allowing users to feel they are mastering a machine when, in reality, their thinking is becoming more tightly bound to its instrumental logic and protocols. Even more, Noble suggested

the differences between the varied forms of computer literacy were superficial. Whether students learned to use or control computers, both approaches necessitated more devices to be purchased, meaning there was also a profit-motive undergirding the demand for computers in schools. From this perspective, a comprehensive view on computer literacy ought to include attention to the political economy of computer culture. While positions like Noble's found resonance with some scholars (Mackay, 1992), by the mid-1990s, the most prominent approaches continued to emphasize use and control—and, for its ease of implementation and direct ties to the job market, most often just the former (Tyner, 1991).

2.2. Information Literacy

Information literacy took shape over the same timespan as computer literacy, but developed largely in the fields of library and information science. Given this disciplinary lineage, information literacy was less concerned with the use, control, or economics of computer technology than with the competencies required to make use of information in computer-based environments (Behrens, 1994). Horton (1983) delineates the differences between the two, saying:

> Information literacy, as opposed to computer literacy, means raising the level of awareness of individuals and enterprises to the knowledge explosion, and how machine-aided handling systems can help to identify, access, and obtain data, documents, and literature needed for problem-solving and decision-making. (p. 16)

Put another way, information literacy bypassed technical concerns to focus on the production and organization of information itself, while recognizing that these demands were heavily inflected by the changing landscape of digital media.

In education, this meant information literacy was not to be a new addition to the curriculum—as some computer literacy champions advocated—but an update and extension of existing instruction related to research skills and library use. For this reason, most internal debates about the concept centered on which information-seeking skills, strategies, and dispositions ought to be emphasized (Snavely & Cooper, 1997). Throughout the 1980s, scholars and professional organizations issued competing taxonomies to delineate these priorities. The American Library Association (1989), for example, defined the key components of information literacy as: (1) recognizing the need for information; (2) identifying what information would address a particular problem; (3) finding the information needed; (4) evaluating the information found; (5) organizing the information; and (6) using the information effectively in addressing the specific problem. Others curated alternate lists, augmenting these themes with more detailed criteria for navigating hypertext and conducting digital searches. Bawden's (2001) survey of the field found more than a dozen of these information literacy classification systems in circulation by the 1990s. In contrast with computer literacy, however, the differences between these perspectives were negligible. Each categorization diverged in its specificity and points of emphasis, but there remained a broad consensus that information literacy was, at its core, concerned with assembling knowledge by retrieving, organizing, and evaluating information (cf. Koltay, 2011).

2.3. Media Literacy

Like information literacy, media literacy emerged in the 1970s as an extension of earlier research traditions—in this case, the postwar investment in education related to propaganda analysis, general semantics, and visual rhetoric (Glander, 2000; Hobbs & McGee, 2014). Scholars often delineate two strands from these traditions that converged as media literacy became formalized into a cohesive project: protectionism and empowerment (Hobbs, 1998; Robbgrieco, 2014). The protectionist strand, drawing from propaganda studies, is concerned with shielding students from media manipulation. In this sense, it shares similarities with information literacy by applying critical evaluation to ascertain information quality, but extends such analyses to a broader range of media artifacts (Hobbs, 2006). Throughout the 1980s, this work took the form of "critical viewing" programs, which provided strategies for navigating visual environments and warding off negative media effects (Brown, 1991). However, some found the focus on protection to be overly narrow, ignoring the ways media literacy might empower students not only in evaluating media messages but in producing their own (Tyner, 1998). Desmond (1997) would later refer to these as the "deficit" and "acquisition" orientations toward media literacy. By the early 1990s, frameworks for media literacy worked to incorporate both of these dimensions—including the widely-cited definition that resulted from the 1992 National Leadership Conference on Media Literacy: "The ability to access, analyze, and evaluate, and communicate messages in a variety of forms" (Aufderheide, 1993, p. 6).

While protectionism and empowerment have played important roles in media literacy, they are not the only frames for mapping the concept's historiography. As with computer literacy, there were rival perspectives that ran parallel to these—even if they did not find so wide an audience. Media theorists Marshall McLuhan (1977) and Neil Postman (1979) each outlined curricula that would help students examine media ecologically—not just evaluating and creating messages, but studying the material and social implications of media environments, from speech and writing to television and computers. Others worked to shape forms of critical media literacy, which applied economic and political analysis to communica-

tion systems (McLaren, Hammer, Sholle, & Reilly, 1997). Kellner (1998) saw this approach as a way to augment computer literacy with insights from more general studies of media, saying, "students should learn new forms of computer literacy that involve both how to use the computer to do research and gather information, as well as to perceive it as a cultural terrain that contains texts, spectacles, games, and new interactive multimedia" (p. 116). Even today, there continue to be calls for more expansive understandings of media literacy—particularly those that move beyond analysis and creation of media artifacts to interrogate broader issues of governance and production in new media environments (cf. Bulger & Davison, 2018).

By the mid-1990s, just before digital literacy had found a foothold in public discourse, these orientations—computer literacy, information literacy, and media literacy—were among the most prominent resources available to those, like Reinking, who were straining to name and describe the incipient challenges for reading and writing in a "post-typographic world." Scholars at the time were actively combining insights from these lineages to synthesize a coherent agenda for education research and practice. Many of these configurations yielded new and competing terminologies: network literacy (McClure, 1994), mediacy (Inoue, Naito, & Koshizuka, 1997), informacy (Neelamaghan, 1995), comperacy (McMillan, 1996), e-literacy (Kope, 2006). Among these rival perspectives, digital literacy began to emerge as a preferred term. Writing with colleagues in 1998 on the same topic as his previous National Reading Conference keynote, Reinking now used the phrase explicitly, saying, "during the ensuing decades, the importance of aligning digital literacy instruction in the classroom with its applications in larger society will become ever more imperative" (Labbo et al., 1998, p. 275). Google NGram and Trends searches show this uptake among literacy scholars to be consistent with the broader rise of digital literacy in popular usage—at first, marginal in comparison with its conceptual predecessors (Figure 1) but eventually outpacing them (Figure 2). In what follows, we consider how digital literacy took shape from these lineages and emerged as a contingent assemblage that continues to condition our approaches to research and teaching.

3. Digital Literacy as Assemblage

As we have suggested, digital literacy was not the inevitable successor to earlier traditions of computer, information, and media literacy. It surfaced in the mid-1990s, amid competing terminologies, as an available resource, adaptable to a range of scholarly and pedagogical challenges. Importantly, the emergence of digital literacy did not mark a clean break from these predecessors, but consolidated recognizable features from each into a tenuous new program. In this sense, digital literacy can be understood less as a bounded concept and more as an assemblage—a layering together of historical meanings

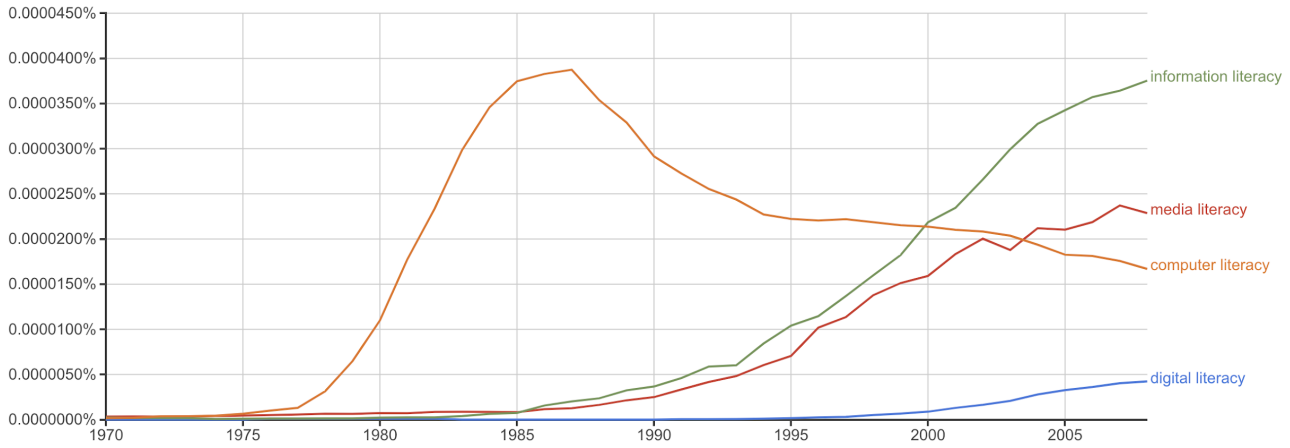


Figure 1. GoogleNGRAM of usage patterns for computer, information, media, and digital literacy between 1970 and 2008.

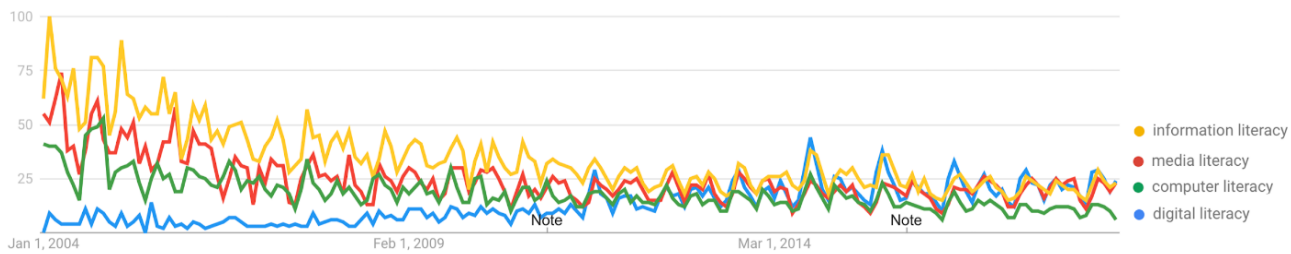


Figure 2. GoogleTrends depiction of usage patterns for computer, information, media, and digital literacy from 2004 to 2018.

and practices that have congealed, for the moment, into a useable discourse. DeLanda (2006) extends Deleuzean notions of assemblage to include the encoding of linguistic formations—like "digital literacy"—arguing that such convergences are part of the "nonlinear histories" (DeLanda, 1997) that constitute and animate the present. By tracing the nonlinear history of digital literacy and its contingent unfolding over time, we can understand and articulate the tensions the term has inherited—and perhaps revive resources from its past that can assist us imagining new directions going forward.

While the phrase digital literacy was used occasionally throughout the early 1990s (e.g., Lanham, 1995; LeBlanc, 1990), it entered wider circulation with the publication of Paul Gilster's (1997) *Digital Literacy*. Much of the literature that followed over the subsequent decade would explicitly reference this lineage in grounding the use of the term (cf. Bawden, 2008). Gilster opened the book by acknowledging that the concept "extends the boundaries of definition" (1997, p. 1), but offered a general sketch of its meaning:

> Digital literacy is the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers….It is cognition of what you see on the computer screen when you use a networked medium. It places demands upon you that were always present, though less visible, in the analog media of newspapers and TV….Not only must you acquire the skills of finding things, you must also acquire the ability to use these things in your life. (1997, pp. 1–2)

Within this description, we see components from traditions already in circulation being woven together under the banner of digital literacy: navigating and using computers and networks (computer literacy); finding and evaluating information (information literacy); and considering how messages are consumed and produced (media literacy). Such overlaps are even more pronounced in Gilster's taxonomy of digital literacy competencies, (1) Internet search, (2) hypertext navigation, (3) knowledge assembly, and (4) content evaluation. Each of these marks an intersection of the most common uses for computer, information, and media literacy. Mapping these junctures (Figure 3), we are able to see how digital literacy, as configured by Gilster, braided together concepts from across these lineages, allowing a particular constellation of focal concerns to emerge. Importantly, we are also able to see the contingencies of this process, as certain components from previous traditions were not actively incorporated into the new assemblage taking shape.

These points of emphasis remained central to digital literacy, even as critical appraisals and redirections surfaced in the mid-2000s. Most historiographies of digital literacy delineate a second wave of scholarship, informed by sociocultural literacy studies (Street, 1995), that adopted a pluralized form, "digital literacies," to signal a shift from normative skill-acquisition to more descriptive accounts of digital activities situated within social, cultural, and political contexts. Lankshear and Knobel open their 2008 edited volume, *Digital Literacies*, by suggesting operational uses of the term ought to be replaced with inquiry into the cultural practices emerging around computer technologies. This reframing sought to alter the composition of digital literacy from the normative competencies outlined in Gilster by shifting the vantage point from which literacy practices were studied. Rather than prescribing skill-based taxonomies for "knowledge assembly," for example, researchers worked to describe the ways people were assembling knowledge with digital media: from producing digital stories (Hull

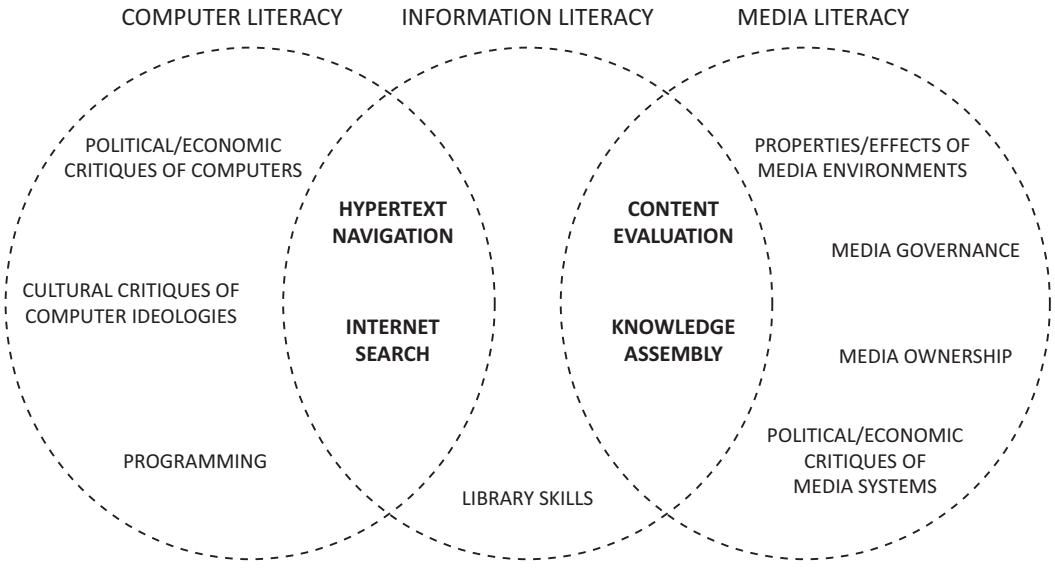


Figure 3. Gilster's taxonomy of digital literacy, emerged at the common intersections of computer, information, and media literacy traditions.

& Katz, 2006) to constructing meaning through video games and virtual worlds (Gee, 2003). Work in this vein has been integral in challenging conventional wisdom related to young people's technology use by documenting the strategic ways youth take up digital media (e.g., boyd, 2014; Ito et al., 2013). Likewise, it has opened pathways for examining how digital media practices are bound up with broader forms of social participation: from fans "restorying" pop culture artifacts to challenge dominant ideologies (Thomas & Stornaiuolo, 2016) to LGBT youth using social media to cultivate personal and community identities (Wargo, 2015). It has also provided avenues for incorporating descriptive findings back into school-based settings in ways that support student flourishing, especially those from nondominant communities (Garcia et al., 2014; Price-Dennis, 2016).

By attending more closely to people's social practices with digital technologies, the shift from prescriptive to descriptive views of digital literacies has played a vital role in expanding the field beyond its early focus on skill-development. This is not to suggest that skill orientations have receded entirely: in policy and curricula documents, it remains common to see taxonomies prescribing the competencies needed for students to become "digitally literate" (e.g., Deye, 2015; UNESCO, 2018). But broadly, the reorientation toward social practices has changed the vantage point from which research on digital literacies is conducted. What has not changed, however, are the central components of digital literacy—those core elements first assembled together in the mid-1990s. Both then and now, digital literacy (and digital literacies) has remained centrally concerned with the ways *users* (e.g., individuals, groups, communities) leverage *technologies* (e.g., computers, software, mobile devices) to consume or produce *content* (e.g., textual, visual, multimedia artifacts; Figure 4). Where prescriptive accounts might differ from descriptive ones in delimiting normative strategies for engaging in configurations of these elements, both operate within a framework that takes these components as their primary focus.

We do not highlight this as an admonishment: as we have suggested, the present model of digital literacies, with its expanded view of social practices, continues to offer generative avenues for research and pedagogy—indeed, both authors locate facets of their work within this framework. But with the proliferation of connective media and mobile technologies, there are times when our inherited models of digital literacies—focused on the skills and social practices of individuals—strains to accommodate the political and economic flows that underwrite contemporary digital activities. A growing body of education research, for example, points to the imbrication of localized digital media use with the governance strategies of policymakers (Davies, Eynon, & Wilkin, 2017), the data-collection practices of corporate owners (Williamson, 2017), and the protocols established by software developers (Lynch, 2016; Scott & Nichols, 2017). While existing models can offer strategies for navigating hypertext or rich accounts of situated social practices in digital environments, they are less adept at explaining the relations between these activities and the technical and economic infrastructures that condition them. In what follows, we consider how resources from those lineages that preceded our present model of digital literacy might be of use in expanding the term's terrain to address our connective media landscape.

4. Reassembling Digital Literacies

In tracing the contingent histories of digital literacy, we have identified several lines of inquiry which prefigure contemporary concerns around issues like privacy, surveillance, and data infrastructures. For example, computer literacy scholarship that advocated familiarity with coding and algorithmic reasoning (Papert, 1980) or that critiqued the political economy of computer culture (Noble, 1984) speak to some of the core tensions that now surface in education research on connective technologies. The first of these relates to the *socio-technical dimension* of digital media. Where our present model of digital literacy tends to treat "technology" as discrete objects—computers, tablets, mobile devices—Papert drew attention to the internal mechanisms that allow devices to function. Such an approach becomes even more salient today, where "code" is no longer limited to isolated commands or programs, but increasingly

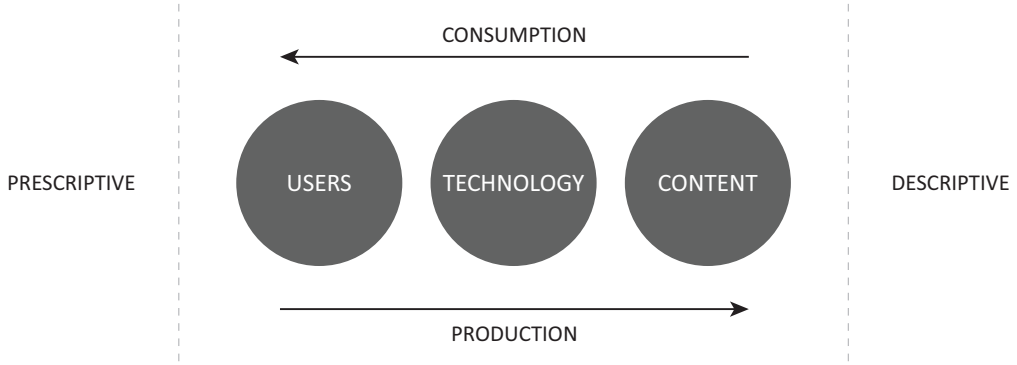


Figure 4. A model of contemporary digital literacy (digital literacies) research.

modulates all aspects of collective life (Mackenzie, 2006). As Berry (2011) argues, it is difficult to separate users' digital activities from the layers of code that condition them. Beneath the hardware itself, code is shaping how *data* is being generated and used; how *algorithms* are processing information; how *interfaces* are structuring user experience; how *protocols* are delimiting what actions are possible within the system; and how *defaults* define standards for usage. In bounding "technology" to objects themselves, our present model of digital literacy offers few resources for tracing how these infrastructures interact with one another—much less how they animate life and work in the digital age. A first step in expanding the terrain of digital literacy, then, might mean reclaiming from the past an attention to the internal complexities of technical systems, and providing both descriptive accounts and prescriptive strategies that can illuminate and guide activities in these domains.

A second set of concerns relates to the *socio-economic dimension* of connective media. Where earlier traditions of computer and media literacy explicitly analyzed the corporate interests shaping media messages (Kellner, 1998) and celebrating investments in technology (Noble, 1984), our inherited model of digital literacy has been more attuned to critiquing commercial content than parsing the workings and extensions of media industries. As with the socio-technical dimension, these earlier lines of inquiry have only grown more important as the economics of digital media are increasingly entwined with even the most prosaic uses of computers. Van Dijck (2013) argues that the socio-technical dimensions of digital media—which include conventional attention to users, technology, and content—are important, but they should not be considered in isolation from their underlying economic relations. For van Dijck, this means examining the *ownership* and profit motives of hardware and software companies; the *governance* structures that adjudicate proper and improper uses of technologies; and the *business models* by which commercial interests operate. Such language provides a path for reviving the long-abandoned economic concerns that were part of earlier traditions in media education. In doing so, it also extends our model of digital literacy to account for the ways empowering acts of digital production—e.g., producing digital stories—and critical readings of media artifacts—e.g., analyzing representations of race or gender in video games—are also forms of labor, which cannot be fully understood apart from inquiry into the economics of platforms. This not only elucidates how connective media blur the boundaries of production and consumption, but also provides a framework from which we can consider the political and ethical implications of these dynamics.

Importantly, we would add that these diverse dimensions of digital media are not static. The technical infrastructures and economic relations that underwrite digital practices are always in motion, adapting to changes within and across their component parts. For instance, a social networking site might adjust its interface to make sponsored content more prominent, which in turn, might lead users to scale back or adapt their usage patterns. These data points could then be circulated back to the platform and incorporated into subsequent business and aesthetic decisions—which would invariably yield new shifts in activity or revenue. In such an example, user practices and platform properties are mutually constitutive—arising in response to the ebbs and flows of the other. Our present model of digital literacy would struggle to capture this fluidity; however, an expanded framework could carve out space for such analysis by adding a socio-historical dimension to the socio-technical and socio-economic. Such a perspective is not altogether different from the ecological approaches to media literacy that arose in the history of computer education (McLuhan, Hutcheon, & McLuhan, 1977; Postman, 1979). Indeed, even as traditions of "media ecology" have been abandoned in the education literature, they have persisted in media studies, where scholars have found "environments" to provide a generative frame for studying flows of histories, materials, people, and practices (Fuller, 2005; Peters, 2015). Perhaps a form of this tradition might yet find a place in educational research.

Putting these dimensions together, we can begin to map a broader terrain for digital literacy research—one that brings together abandoned concerns from the past with resources of contemporary media theorists (Berry, 2011; van Dijck, 2013; Figure 5). The framework not only opens "technology" to include the technical infrastructures that constitute it (hardware, data, algorithms, protocols, defaults), but also draws on van Dijck (2013) to pair the socio-economic dimension (ownership, governance, business model) with the socio-technical (users, technology, content). In doing so, it foregrounds the imbrication of production and consumption that occurs when these components are layered together: in connective media, consumption always produces datastreams, which are, in turn, consumed by algorithms, if not by other users (cf. Ritzer & Jurgenson, 2010). Further, we can understand the emergent relations between these components as situated in a socio-historical context, an emphasis that aligns with social practice approaches to digital literacies (Lankshear & Knobel, 2008; Sefton-Green, Nixon, & Erstad, 2009). These dynamic relations can be studied both from a descriptive perspective that traces such flows as they occur, or a prescriptive one that delineates strategies for navigating the complex terrain.

Our purpose in laying out this map is not be exhaustive, but to suggest that a multi-dimensional approach to digital literacy—one that reintegrates certain abandoned legacies from the concept's history and emphasizes how social practices always operate in relation to sociohistorical systems and institutions—may be of use in addressing the ethical and political questions that are emerging in education with the spread of connective technologies. Not all of these dimensions will be equally consequen-

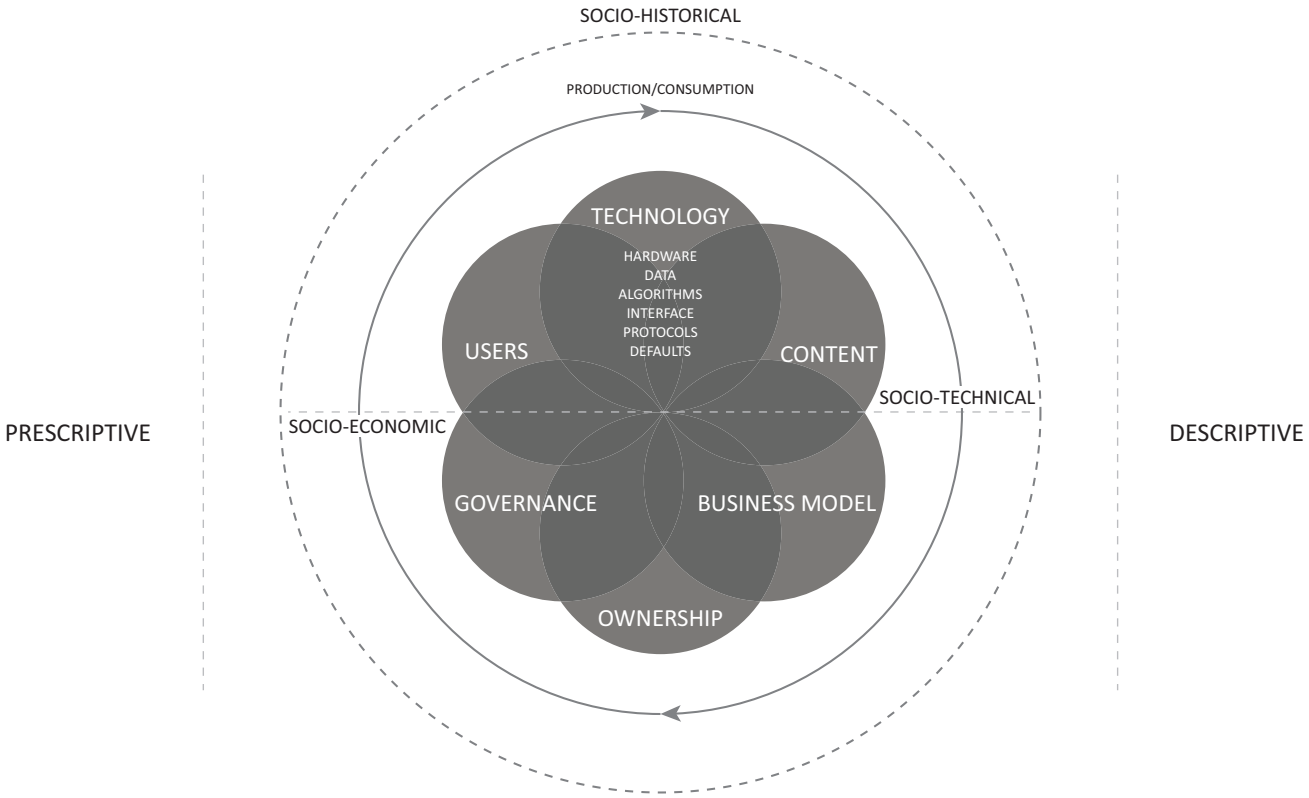


Figure 5. An expanded model for digital literacy research that includes socio-technical, socio-economic, and socio-historical dimensions.

tial for every research question related to digital literacy, but we diagram them here to illustrate the range of relations that remain under- or un-explored in the education literature. As new media are developed and integrated into educational contexts – from virtual reality to machine learning technologies—we will need more expansive and flexible resources for analyzing their properties, relations, and implications. We offer this map as one framework for re-assembling digital literacy to address these concerns.

5. Possible Futures

Just as the histories of digital literacy are shot through with contingencies, there is nothing inevitable about its futures. In the introduction to the *Handbook of Writing, Literacies, and Education in Digital Cultures*, Mills and Stornaiuolo (2018) outline emerging technological developments that frameworks for digital literacy may soon be asked accommodate: the networked Internet of Things, embedded geolocational devices, human-technology interfaces and wearable tech, virtual and augmented reality overlays, new forms of collaborative text production, and personalized data-tracking and analytics. Addressing such a wide range of devices, their technical and economic infrastructures, their possibilities for literacy learning, and their capacities to ameliorate or exacerbate forms of oppression or inequity, will require flexible theories, pedagogies, and methodologies. We have suggested here that understanding digital literacy as an assemblage of meanings might provide one pathway for expanding the scope of our models to better analyze the social and political relations that flow from these transactions.

But an assemblage approach can also draw our attention to the limitations of such prognostications. It is significant, for example, that imagined futures of digital literacy tend to center on new or changing technologies—the Internet of Things, say, or artificial intelligence. The assumption, in other words, is that future socio-historical contexts for digital literacy will look very much like the present: that the pace and scale of technological development will continue unabated, that digital literacy practices will follow in response to these developments, and that researchers will continue to analyze how power or learning are implicated in these relations. But these configurations need not remain the same. This could be due to some externality that alters our modes of production or standards of living—war, for instance, or global climate change, which will inundate all facets of life in the decades and centuries ahead, including our relations to digital media. But it could also be due to changes in law, policy, industry, design, or pedagogy that might follow from research, activism, and organizing in the present. Put another way, digital literacies research can do more than prescribe skills for navigating new devices or describe practices that emerge with these technologies; it can intervene in the systems that produce them in order to make them more just and equitable.

The assemblage approach outlined above allows us to trace the technical and economic flows that animate digital practices. But crucially, the point is not just to render a more accurate or detailed map of the ways people are exploited, it is to use that map to change the relations that produce exploitation. In research, that might mean addressing policymakers and the general public about the need for ethical technological infrastructures, or even partnering with designers to create alternative devices that adhere to standards for data-protection and privacy. In pedagogy, it might mean introducing students to the forms of ownership and governance that underpin their personal devices and offering pathways to organize against those practices they find invasive. Likewise, teachers and students, together, might put pressure on schools and districts to articulate proactive tech-adoption policies that prioritize student learning and privacy. Such approaches begin to reconfigure the assemblage of digital literacy in ways that promote and sustain the flourishing of teachers and students in the futures yet to come.

6. Conclusion

In framing digital literacy as an assemblage, we sought to foreground its historical dimensions, particularly the contingent and contradictory histories of its genealogy across fields. While current uses of the term include both normative catalogs of digital skills and descriptive accounts of people's digital practices, we argue here that these perspectives are not capacious enough to address the challenges posed by emerging mobile and connective technologies—issues of surveillance, algorithmic bias, commercial profit motives, and myriad others. To address these shortcomings, we turned to the concept's foundations in computer, information, and media literacy. We bring those histories into conversation with contemporary theories of connective media (van Dijck, 2013) to suggest different dimensions of the digital literacy assemblage that may be useful for practitioners and scholars—not only the currently emphasized dimensions (users, content, and technologies) and those operating more subtly (governance, ownership, and business), but also the shifting socio-historical context in which these interrelations unfold. Such a multidimensional framework positions educators and researchers to ask complex questions about which dimensions are animated in practice, drawing attention, for example, to the ways hardware, protocols, and interfaces in the technology dimension interact not only with people's practices but also with the development of business models to profit from those uses. Just as there was no inevitability about how digital literacy came to be assembled in current configurations, we see the future of the concept as similarly emergent. We hope this multidimensional orientation is useful in pointing toward those historical aspects of the concept that can help in addressing the complex challenges that lie ahead.

Acknowledgments

We thank the editors of the issue and anonymous reviewers for their feedback.

Conflict of Interests

The authors declare no conflict of interests.

References

American Library Association. (1989). Presidential commission on information literacy. In G. E. Mensching & T. B. Mensching (Eds.), *Coping with information illiteracy: Bibliographic instruction for the information age* (pp. 156–171). Ann Arbor, MI: Pierian Press.

Aufderheide, P. (1992). *Media literacy: A report of the national leadership conference on media literacy*. Washington, DC: Aspen Institute. Retrieved from https://eric.ed.gov/?id=ED365294

Ávila, J., & Pandya, J. Z., (Eds.). (2012). *Critical digital literacies as social praxis: Intersections and challenges*. New York, NY: Peter Lang.

Baker, C. D., & Luke, A. (Eds.). (1991). *Towards a critical sociology of reading pedagogy*. Philadelphia, PA: John Benjamins Publishing.

Bawden, D. (2001). Information and digital literacies: A review of concepts. *Journal of Documentation*, *57*(2), 218–259.

Bawden, D. (2008). Origins and concepts of digital literacy. In C. Lankshear & M. Knobel (Eds), *Digital literacies: Concepts, policies, practices* (pp. 17–32). New York, NY: Peter Lang.

Behrens, S. (1994). A conceptual analysis and historical overview of information literacy. *College and Research Libraries*, *55*(4), 309–322.

Berry, D. M. (2011). *The philosophy of software: Code and mediation in the digital age*. New York, NY: Palgrave Macmillan.

Brown, J. A. (1991). *Television "critical viewing skills" education*. Hillsdale, NJ: Erlbaum.

Bulger, M., & Davison, P. (2018). *The promises, challenges, and futures of media literacy*. New York, NY: Data & Society.

Coiro, J. (2003). Reading comprehension on the internet: Expanding our understanding of reading comprehension to encompass new literacies. *The Reading Teacher*, *56*(5), 458–464.

Davies, H. C., Eynon, R., & Wilkin, S. (2017). Neoliberal gremlins? How a scheme to help disadvantaged young people thrive online fell short of its ambitions. *Information, Communication, & Society*, *20*(6), 860–875.

DeLanda, M. (1997). *A thousand years of nonlinear history*. Cambridge, MA: Zone Books.

DeLanda, M. (2006). *A new philosophy of society: Assemblage and social complexity*. London: Bloomsbury Academic.

Desmond, R. (1997). Media literacy in the home: Acquisition versus deficit models. In R. Kubey (Ed.), *Media literacy in the information age* (pp. 323–343). New Brunswick, NJ: Transaction Publishers.

Deye, S. (2015). *Promoting digital literacy among students and educators*. Washington, DC: National Conference of State Legislators. Retrieved from http://www.ncsl.org/Portals/1/Documents/educ/digLiteracy_final.pdf

Fuller, M. (2005). *Media ecologies*. Cambridge, MA: MIT Press.

Garcia, A. (2014). *Teaching in the connected learning classroom*. Irvine, CA: Digital Media and Learning Research Hub.

Gee, J. P., (2003). *What video games have to teach us about learning and literacy*. New York, NY: Palgrave Macmillan.

Gilster. P. (1997). *Digital literacy*. New York, NY: Wiley.

Glander, T. (2000). *Origins of mass communications research during the American Cold War: Educational effects and contemporary implications*. New York, NY: Routledge.

Haddix, M., & Sealey-Ruiz, Y. (2012). Cultivating digital and popular literacies as empowering and emancipatory acts among urban youth. *Journal of Adolescent & Adult Literacy*, *56*(3), 189–192.

Hawisher, G. E., LeBlanc, P., Moran, C., & Selfe, C. L. (1996). *Computers and the teaching of writing in American higher education, 1979–1994: A history*. Norwood, NJ: Ablex Publishing.

Hicks, T., & Turner, K. H. (2013). No longer a luxury: Digital literacy can't wait. *English Journal*, *102*(6), 58–65.

Hobbs, R. (1998). The seven great debates in the media literacy movement. *Journal of Communication*, *44*(2), 16–32.

Hobbs, R. (2006). Reconceptualizing media literacy for the digital age. In A. Martin & D. Madigan (Eds.), *Literacies for learning in the digital age* (pp. 99–109). London: Facets Press.

Hobbs, R., & McGee, S. (2014). Teaching about propaganda: An examination of the historical roots of media literacy. *Journal of Media Literacy Education*, *6*(2), 56–67.

Horton, F. W. (1983). Information literacy vs. computer literacy. *Bulletin of the American Society for Information Science*, *9*, 14–16.

Hull, G., & Katz, M. (2006). Crafting an agentive self: Case studies of digital storytelling. *Research in the Teaching of English*, *41*(1), 43–81.

Inoue, H., Naito, E., & Koshizuka, M. (1997). Mediacy: What it is? Where to go? *International Information and Library Review*, *29*(3/4), 403–413.

Ito, M., Gutiérrz, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., Schor, J., Sefton-Green, J., & Watkins, S. C. (2013). *Connected learning: An agenda for research and design*. Irvine, CA: Digital Media and Learning Research Hub.

Jenkins, H., Ford, S., & Green, J. (2013). *Spreadable media: Creating value and meaning in a networked culture*. New York, NY: New York University Press.

Kellner, D. (1998). Multiple literacies and critical pedagogy in a multicultural society. *Educational Theory*, *48*, 103–122.

Koltay, T. (2011). The media and the literacies: Media literacy, information literacy, digital literacy. *Media, Culture, & Society*, *33*(2), 211–221.

Kope, M. (2006). Understanding e-literacy. In A. Martin & D. Madigan (Eds.), *Digital literacies for learning* (pp. 15–36). London: Facet Publishing.

Labbo, L., Reinking, D., & McKenna, M. (1998). Technology and literacy education in the next century: Exploring the connection between work and schooling. *Peabody Journal of Education*, *73*(3/4), 273–289.

Lankshear, C., & Knobel, M. (2008). *Digital literacies: Concepts, policies, and practices*. New York, NY: Peter Lang.

Lanham, R. A. (1995). Digital literacy. *Scientific American*, *273*(3), 160–161.

LeBlanc, P. J. (1990). *The development of computer-aided composition software and its implications for composition* (Unpublished doctoral dissertation). University of Massachusetts, MA.

Leu, D. J., & Kinzer, C. K. (2000). The convergence of literacy instruction with networked technologies for information and communication. *Reading Research Quarterly*, *35*(1), 108–127.

Lockheed, M. E., Hunter, B., Anderson, R. E., Beazley, R. M., & Esty, E. T. (1983). *Computer literacy: Definition and survey items for assessment in schools*. Washington, DC: National Center for Educational Statistics.

Luehrmann, A. (1982). Computer literacy: Why it is; why it is important. *Electronic Learning*, *1*(5), 20–22.

Lynch, T. L. (2016). *The hidden role of software in education research: Policy to practice*. New York, NY: Routledge.

Mackay, H. (1992). From computer literacy to technology literacy. In J. Beynon & H. Mackay (Eds.), *Technological literacy and the curriculum* (pp. 125–147). New York, NY: Falmer.

Mackenzie, A. (2006). *Cutting code: Software and sociality*. New York, NY: Peter Lang.

McClure, C. R. (1994). Network literacy: A new role for libraries. *Information Technology and Libraries*, *13*, 115–125.

McLaren, P., Hammer, R., Sholle, D., & Reilly, S. (1997). *Rethinking media literacy*. New York, NY: Peter Lang.

McLuhan, M., Hutcheon, K., & McLuhan, E. (1977). *The city as classroom: Understanding language and media*. Agincourt, ON: Book Society of Canada.

McMillan, S. (1996). Literacy and computer literacy: Definitions and comparisons. *Computers and Education*, *27*(3/4), 161–170.

Mills, K. (2010). A review of the "digital turn" in the new literacies studies. *Review of Educational Research*, *80*(2), 246–271.

Mills, K. A., & Stornaiuolo, A. (2018). Introduction: Dig-

ital diversity, ideology, and the politics of a writing revolution. In K. A. Mills, A. Stornaiuolo, A. Smith, & J. Z. Pandya (Eds.), *Handbook of writing, literacies, and education in digital cultures* (pp. 1–10). New York, NY: Routledge.

Morrell, E. (2012). 21st century literacies, critical media pedagogies, and language arts. *The Reading Teacher*, *66*(4), 300–302.

Moursund, D. (1982). Personal computing for elementary and secondary school students. In R. J. Siedel, R. E. Anderson, & B. Hunter (Eds.), *Computer literacy*. New York, NY: Academic Press.

Neelameghan, A. (1995). Literacy, numeracy…informacy. *Information Studies*, *1*(4), 239–249.

Noble, D. (1984). Computer literacy and ideology. *Teachers College Record*, *85*(4), 602–614.

Pahl, K., & Rowsell, J. (2010). *Artifactual literacies: Every object tells a story*. New York, NY: Teachers College Press.

Papert, S. (1980). *Mindstorms: Children, computers, and powerful ideas*. New York, NY: Basic Books.

Papert, S. (1992). *The children's machine: Rethinking school in the age of the computer*. New York, NY: Basic Books.

Peters, J. D. (2015). *The marvelous clouds: Toward a philosophy of elemental media*. Chicago, IL: University of Chicago Press.

Postman, N. (1979). *Teaching as a conserving activity*. New York, NY: Delacorte.

Price-Dennis, D. (2016). Developing curriculum to support black girls' literacies in digital spaces. *English Education*, *48*(4), 337–361.

Reinking, D. (1995). Reading and writing with computers: Literacy research in a post-typographic world. *Forty-fourth yearbook of the national reading conference*. Chicago, IL: National Reading Conference.

Robbgreico, M. (2014). Why history matters for media literacy education. *Journal of Media Literacy Education*, *6*(2), 3–22.

Scott, J., & Nichols, T. P. (2017). Learning analytics as assemblage: Criticality and contingency in online education. *Research in Education*, *98*(1), 83–105.

Sefton-Green, J., Nixon, H., & Erstad, O. (2009). Reviewing approaches and perspectives on "digital literacy." *Pedagogies: An International Journal*, *4*(2), 107–125.

Snavely, L, & Cooper, N. (1997). The information literacy debate. *The Journal of Academic Librarianship*, *23*(1), 9–14.

Street, B.V. (1995). *Social literacies: Critical approaches to literacy in development, ethnography, and education*. London: Longman.

Thomas, E. E., & Stornaiuolo, A. (2016). Restorying the self: Bending toward textaul justice. *Harvard Educational Review*, *86*(3), 313–338.

Tyner, K. (1991). The media education elephant. *Center for Media Literacy*. Retrieved from https://www.medialit.org/reading-room/media-education-elephant

Tyner, K. (1998). *Literacy in a digital world: Teaching and learning in the age of information*. Mahwah, NJ: Lawrence Erlbaum.

UNESCO. (2018). *A global framework of reference on digital literacy skills for indicator 4.4.2*. Montreal: United Nations Educational, Scientific, and Cultural Organization Institute for Statistics. Retrieved from http://uis.unesco.org/sites/default/files/documents/ip51-global-framework-reference-digital-literacy-skills-2018-en.pdf

Van Dijck, J. (2013). *The culture of connectivity: A critical history of social media*. New York, NY: Oxford University Press.

Wargo, J. (2015). "Every selfie tells a story...": LGBTQ youth lifestreams and new media narratives as connective identity texts. *New Media & Society*, *19*(4), 560–578.

Williamson, B. (2017). *Big data in education*. Thousand Oaks, CA: Sage.

About the Authors

T. Philip Nichols is an Assistant Professor in the Department of Curriculum and Instruction at Baylor University. His research focuses on relations among technology, school reform, and literacy education.

Amy Stornaiuolo is an Associate Professor of literacy education at the University of Pennsylvania. Her research focuses on adolescent literacy, writing, and learning with new media and technology.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 25–35
DOI: 10.17645/mac.v7i2.1888

Article

Digital Literacies or Digital Competence: Conceptualizations in Nordic Curricula

Anna-Lena Godhe

Department of Education, Communication, and Learning, University of Gothenburg, 405 30 Gothenburg, Sweden;
E-Mail: anna-lena.godhe@gu.se

Submitted: 15 December 2018 | Accepted: 10 March 2019 | Published: 11 June 2019

Abstract
This article examines how the concepts of digital literacies and digital competence are conceptualized in curricula for compulsory education within the Nordic countries. In 2006, the European Union defined digital competence as one of eight key competences for lifelong learning. The terms digital literacies and digital competence have since been used interchangeably, particularly in policy documents concerning education and the digitalization of educational systems and teaching. However, whether these concepts carry similar meanings, and are understood in a similar way, across languages and cultures is not self-evident. By taking the curricula in Sweden, Denmark, Finland, and Norway as examples, this article attempts to clarify similarities and differences in how the concepts are interpreted, as well as what implications this has for the digitalization of education. The analyses reveal that different terms are used in the curricula in the different countries, which are connected to themes or interdisciplinary issues to be incorporated into school subjects. The conceptualizations of the terms share a common emphasis on societal issues and a critical approach, highlighting a particular Nordic interpretation of digital literacies and digital competence.

Keywords
bildung; curricula; digital competence; digital literacies; education; literacy

Issue
This article is part of the issue “Critical Perspectives on Digital Literacies: Creating a Path Forward”, edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

Questions of how compulsory education can prepare students for citizenship in a digitalized society are currently on the agenda in many countries around the world, for example concerning whether programming should be included in curricula and how to teach students to critically evaluate information and sources in digital environments.

As pointed out by UNESCO (Broadband Commission, 2017), definitions and terms such as digital skills, competencies, knowledge, understandings, and thinking are used interchangeably since there is not a set of agreed terms to describe the abilities needed in a digitalized societies. In the Digital Education Action Plan (European Commission, 2018), for example, no distinction is made between digital skills and competences. The concepts digital literacy and digital competence are in focus in this article since they are concepts that are used in public discourse and in research and they are also present, more or less explicitly, in education policy documents, such as curricula.

Spante, Hashemi, Lundin and Algers (2018) have in a systematic review outlined how the concepts of digital literacy and competence are used in higher education research and policy documents. They came to the conclusion that digital literacy has been used over a longer period of time and more frequently, particularly in research. However, definitions in policy documents, where digital competence is more frequently used, tend to gain legitimacy. Lea (2013) argues that literacy’s original connections to practices of reading and writing, tend to be

overlooked by competence-based agendas with an increased focus on a set of transferable skills and competences that can be used in educational contexts, as well as in digital societies in general. According to Spante et al. (2018), digital competence is used in politically underpinned publications and tends to concern the professional use of technology in different contexts. They also discern a geographical difference where digital literacy is mainly used in English speaking countries whereas digital competence is used in European countries such as Spain, Italy and the Nordic countries.

Concepts like digital literacies and digital competence are used globally but whether these terms carry the same meaning across languages and cultures or if they are understood in a similar way is another matter. By taking the Nordic curricula as examples, this article attempts to clarify similarities and differences in how the terms are conceptualized and used in Sweden, Denmark, Finland, and Norway. Since the Nordic countries are close geographically, and to some extent also culturally, differences between these countries may indicate where understandings of the terms tend to diverge also in a broader global context, while similarities found may point out what is significant in the Nordic interpretation of the concepts.

1.1. Literacy and Digital Literacies

In educational contexts, literacy is sometimes used as synonymous to central terms, such as knowledge and learning (Säljö, 2012). However, in research on language and language development, the term literacy derives from the ability to read and write. Reading and writing have always been central and essential in education. While, literacy in educational contexts previously mainly referred to the ability to decipher, copy, and memorize print-based typographical texts, it nowadays involves being able to understand and draw conclusions from a number of resources (cf., Resnick, 1987; Säljö, 2010). Moreover, there has been a shift from reproducing what is already known to producing something new and relevant, which means that production and performance have become increasingly important in literacy practices (Säljö, 2010).

Street (1995) argued for the need for an ideological model of literacy, where literacy is understood as social practices, to shift away from the autonomous model which regards literacy as a technical skill to master. From the perspective of Street's approach, focused on the practices of reading and writing, literacy cannot be regarded as neutral but is always situated and affected by, for example, social, cultural, and historical aspects of the practices in which it occurs. Concepts containing literacy, such as digital literacy, tend to contain an inherent tension between the two models identified by Street (1995). In this way, conceptualizations of different literacies can be placed on a continuum from descriptions of technical skills at one end, to descriptions of social practices at the other. When viewed as a technical skill, digital literacy, for example, tends to focus on skills such as being able to handle the digital devices when communicating online. Regarding literacy as a social practice, the interest instead is on, for example, how online environments affect the way individuals communicate and the social norms that emerge on online arenas. Based on issues of diversity, both when it comes to ways of expressing meaning and in relation to multicultural societies, literacy is nowadays often used in the plural, literacies. The need for an expansion of the notion of literacy has been argued for based on different premises, and notions of what is "new" vary, as well as the changes which are said to be needed in education. Common to the different arguments for expanding the notion of literacy and what it means to be able to read and write, is that they focus on how meaning is made in a diverse and rapidly changing society. In the late 20th century, an expansion of the concept of literacy was largely argued for based on a perception of literacy as social practice (e.g. Barton & Hamilton, 1998; Scribner & Cole, 1981; Street, 1998). Street's (1998) notion of an ideological model of literacy draws attention to the situatedness of literacy and how the social setting effects what it means to be able to read and write. The need to pay greater attention to vernacular literacies in educational settings is stressed and the "new", in this case, mainly refers to how we understand and describe literacy.

The New London Group (1996) argued for socially responsible curricula and an expansion of literacy based on the increased multiplicity in contemporary societies due to globalization, increased mobility, and the multiplicity of communication channels. "New" in this perspective relates to global societal changes that have implications for education and put new demands on the formulation of curricula. The need to refer to literacies, or multiliteracies, rather than the singular form was made based on issues of diversity. Diversity here refers both to populations from increasingly diverse backgrounds and to the increased diversity in communication channels where texts combining verbal language, images, and sound are common.

From a multimodal perspective, verbal language is one of numerous ways of expressing meaning and therefore, in educational settings, it needs to be recognized and greater attention be given to the fact that there are other ways of expressing meaning, such as images, sound, and movement (Bezemer & Kress, 2016; Johnson & Kress, 2003). Kress (2010) argues that the relationship between modes is changing since images and sound are becoming increasingly important in screen-based communication. What is "new" in this perspective is the recognition and evaluation of alternative modes other than the verbal and their increased importance in a changing communication landscape.

When the concept of digital literacies emerged around the turn of the century it was related to 'new' technology at that time, such as the internet. The dig-

ital literacies suggested by Gilster (1997) differed from earlier conceptions of literacies in that mastering the digital technology was highlighted, whilst aspects relating to understanding and making meaning were downplayed. Focusing on practices that involved the use of digital technology, Lankshear and Knobel (2008) argued for an expansion of literacies since digital technologies facilitated new ways of creating, receiving and sharing texts. "New" in this perspective referred to a new mindset that involved both new technology and new "Ethos stuff". Comparing new and conventional literacies, the "Ethos stuff" connected to new literacies meant that they were more collaborative, participatory and distributed, whereas conventional literacies were more published and author-centric (Lankshear & Knobel, 2008).

Media literacy is sometimes considered to be part of, or equivalent to, digital literacy (Erstad & Amdam, 2013). However, Sefton-Green, Nixon and Erstad (2009) write about the different focus in media and technology education in the 1990s in Norway. Media education focused on learning about the media, not learning *through it*. Technology education mainly concerned teaching students how to use computer hardware and software. These differences meant that media education was mainly done in the social sciences by teachers with a background in the humanities, while technology education was carried out by teachers with a natural sciences background. According to Sefton-Green et al. (2009), this split has prevailed and been manifested in conceptualizations of digital literacy as well as in policy and educational practices.

Curricula in the Nordic countries, as well as research on classroom practices, are compared by Elf, Gilje, Olin-Scheller and Slotte (2018) with a focus on multimodality. They come to the conclusion that multimodal teaching is connected to the use of digital technology and that multimodality as a concept is discernible in mother tongue subjects (L1-subjects) in all four countries; i.e. Swedish, Danish, Finnish, and Norwegian, but there are differences in how multimodality is conceptualized. Moreover, they see a change in all four settings, moving from reception to production in the goals to be achieved by the students. Whereas receptive analyses, of for example the multimodality of advertisements or films, have been present in the curricula previously, goals have now been added aiming at the production of multimodal texts. In order to assess the multimodal productions that students are expected to create, qualitative aspects of multimodal productions need to be formulated in, for example, grading criteria. Elf et al. (2018) describe this as a historically new situation in the Nordic context.

Recently there has been an increased interest in how to develop critical digital literacies and Pangrazio (2017) outline three understandings of critical digital literacies; a critical literacy approach, a critical media literacy approach, and a digital design approach. Pangrazio also points out that critical digital literacy appears to have become positioned as an either/or position; "where critique of the digital context is focused on either critical consumption or creative production; and builds either the technical skills of design or the more general, theoretical skills of critique" (p. 168). Pangrazio argues for the need to consider critical digital literacies in a broader sense where social, political, economic, and technical issues are considered. An understanding of how power symmetries are created in digital environments could be developed by examining how inequalities are reinforced by digital technologies and how they could be challenged by focusing on the role that questioning and challenging have in shaping and re-configuring techno-social systems. This conceptualization of digital literacies, as social practices affected by broader societal issues, echoes the arguments brought forward by Street (1995) in the ideological model of literacy.

Literacy is not a concept that is easily translated into the Nordic languages. *Litteracitet* is in Sweden sometimes used as a direct translation of the English word but often the English term is retained instead. Similarly, competence is often used as a term (*kompetens* in Swedish, *kompetanse* in Norwegian and Danish[1]) but sometimes other words are used that could also be translated as basic skills. This means that different terms are used in the different national curricula. Krumsvik (2008) states that Norway, in 2006, was the first country in the world to introduce digital competence, as a basic skill in line with reading and writing, in their national curriculum. However, the term competence is not used but rather what may also be translated as basic skills (*grunnleggende færdigheter*).

1.2. Digital Competence

The concepts of competence and competency have mainly been discussed in the literature on management strategies and have sometimes been used interchangeably. While Le Deist and Winterton (2005) describe competence as a "fuzzy concept" because of the difficulties in arriving at a definition which can accommodate the different ways that the term has been used. Nevertheless, they outline the difference between competence and competency; although the usage is inconsistent, competence predominantly refers to functionality and being able to function within an organisation effectively, whereas competency refers to behavioural areas. In research and policy on education, the term competence is the one that is predominantly used.

In 2006, Digital competence was included in the framework of key competences for all citizens by the European Union (EU) commission (European Parliament, 2006). Eight key competences were outlined as necessary for personal fulfilment, active citizenship, social cohesion, and employability. The EU framework should form a basis for further learning and the ability to develop and update the key competences throughout life. Ala-Mutka, Punie and Redecker (2008) state that EUs

[1] Since Finland has two official languages, Finnish and Swedish, the Finnish documents have been read in Swedish.

definition of digital competence: "involves the confident and critical use of ICT for employment, learning, self-development, and participation in society" (p. 4). Moreover, the definition includes the knowledge, skills, and attitudes needed to work, live, and learn in the knowledge society. However, Søby (2008) argues that the meaning of the concept of digital competence is highly negotiable and in need of interpretation in actual educational practice. It is not simply details of what specific skills are to be taught in schools which are at stake in such negotiations and interpretations; on a deeper level, there is also the question of what knowledge and competences the citizens of tomorrow will need and are entitled to. Hope and expectations to deal with a number of complex questions are being placed on schools and a vision of technological developments as the solution to these complex questions are prominent. However, Selwyn (2013, 2016) explicate that while technology may provide new or different possibilities, they also bring about new questions and problematic issues and tend to reproduce grounds for discrimination, e.g. gender, ethnicity, religion, sexual orientation, and disability.

In policy documents from UNESCO (Broadband Commission, 2017) and the EU (Carretero, S., Vuorikari, R., & Punie, Y, 2017) a combination of a technical and a practice-oriented view can be discerned. UNESCO outlines three levels of digital competence; functional skills, generic skills, and higher level skills. The functional skills include a basic understanding of how technology works as well as access to technology, whereas the higher level skills relate to specialist competences required for ICT professionals, such as programming skills, critical thinking, and innovation. The generic skills at the intermediate level, are often the ones in focus in national policies as well as in the EU's Digital Competence Framework for Citizens (Carretero et al., 2017) and the OECD's Framework for Digital Skills (OECD, 2016). DigComp2.1 (Carretero et al., 2017) consist of five competence areas, each with seven proficiency levels, which together create a complex structure of what digital competence contains and how different levels can be measured.

Krumsvik (2008) writes that the concept of digital competence in the Nordic countries is interpreted and used referring to the German term *bildung* (*bildning*—in Swedish, *dannelse*—in Norwegian and Danish). Gustavsson (2009) explains *bildung* as a personal relationship to knowledge and understanding of oneself as well as the world. Global questions connected to citizenship and human rights and the development of humanity are important aspects of *bildung* (Biesta, 2002). According to Krumsvik, digital bildung concerns the effect that digitalization has on society and includes identity development and how individuals partake in different communities online. The need to develop critical abilities and being able to evaluate digital sources, as well as being aware of ethical and moral issues connected to the use of technology is a part of digital *bildung*.

2. Comparing Curricula: Methodology and Methodological Considerations

General parts of the curricula in all four countries have been studied (Skolverket, 2017a; Undervisningsministeriet [UVM], 2018a; Utbildningsstyrelsen, 2014; Utdanningsdirektoratet, 2018), as well as documents that specifically aim to conceptualize digital competence, or the equivalent concepts used (Skolverket, 2017b; Utdanningsdirektoratet, 2017; UVM, 2018b). No such documents were found in connection to the Finnish curriculum, but this curriculum is, on the other hand, a more extensive document which includes conceptualizations of the terms used. Since the Norwegian curriculum has included conceptualizations of digital competence for several years, an earlier version of the framework for basic skills (Utdanningsdirektoratet, 2012) has also been analysed in order to compare it to the more recent one.

Rather than searching for specific terms, the documents were read in order to identify which concepts were used and how they were conceptualized. The findings were compared across curricula and analyzed in relation to earlier research on digital literacy and digital competence.

Elf et al. (2018) discuss methodological questions in relation to the analysis and comparison of curricula in different countries, which strongly relate to methodological issues in this article. Similar to Elf et al. (2018), difficulties were found when reading and analyzing the curricula since they are written and structured in different ways. Another difficulty was finding and choosing which documents to read and analyze. An overview of the documents that were reviewed as well as the concepts used in the different countries are presented in Table 1.

Since the author is most familiar with the Swedish curriculum and educational system, the analysis of the Swedish curricula is of deeper scope in the sense that the analysis was made on both the general level and at the subject level. The analysis of the Danish, Finnish, and Norwegian curricula focus on the general part of the curricula which outlines interdisciplinary aspects, whereas the analysis of the Swedish curricula aims to give a more comprehensive view of the conceptualization of digital competence also in connection to subject syllabi. The decision to focus on the general part of the curricula in all countries was made based on the scope of this article but further analysis of, for example, syllabi for different subjects could be a possible way to further the analysis.

3. Nordic Curricula

Curricula in the Nordic countries have all undergone recent changes and revisions, partially due to issues of digitalization of society and education. In the following section, how digital literacy and competence are referred to in the curricula in the four Nordic countries, Denmark, Finland, Norway and Sweden, are outlined. Curricula for compulsory education in all four countries, i.e. primary

Table 1. An overview of the concepts used and the reviewed documents.

Country	Concepts used	Status in the curricula	Reviewed documents
Denmark	IT and Media	One of three interdisciplinary fields	Common goals in Danish curriculum (UVM, 2018a) Guidance to IT and Media (UVM, 2018b)
Finland	Multiliteracies and Digital competence	Two of seven multifaceted competences	Finnish curriculum for compulsory education (Utbildningsstyrelsen, 2014)
Norway	Digital skills (*ferdigheter*)	One of five basic skills	Overall part of the curriculum (Utdanningsdirektoratet, 2018) Framework for basic skills (Utdanningsdirektoratet, 2012, 2017)
Sweden	Digital competence	Incorporated into overall goals and syllabus for some subjects	Swedish curricula for compulsory education (Skolverket, 2017a) Commentaries to revisions of curricula and digital competence (Skolverket, 2017b)

and lower-secondary school, have been analyzed. First, a more in-depth analysis of the Swedish curricula is made, followed by an outline of how digital competence is conceptualized in the general part of the curricula in the other Nordic countries.

3.1. Sweden

The current Swedish curricula came into effect in 2011 but have been revised several times since. Following a national strategy for the digitalization of education, revisions were made in 2017 to strengthen students' digital competence as well as the links between different subjects (Skolverket, 2017a).

The Swedish curricula consist of two introductory chapters outlining fundamental values and tasks, as well as overall goals and guidelines for all grades and subjects. Revisions were made in these chapters as well as in the aims and core content of Swedish, Swedish as a second language, Social science, Physical education, Natural Science, Technology, Mathematics, and Crafts[2]. Though the revisions intend to strengthen students' digital competence, no alterations to the knowledge requirements in the subject syllabi were made. This implies that the digital competence of the students is not part of assessment and therefore cannot be referred to as a standard to obtain but rather a skill to use in order to acquire the knowledge required.

The Swedish National Agency for Education has published commentaries on the revisions to further explain to teachers what is meant by the curricula's revisions (Skolverket, 2017b). In the commentary, they outline four aspects of digital competence; to understand the effects of digitalization on society, to be able to use and understand digital tools and media, to have a critical and responsible approach, and to be able to solve problems and convert ideas into action. These aspects are clearly mirrored in the following paragraph which has been added to the first chapter of the curricula:

> The school should contribute to the students developing an understanding of how digitalization affects the individual and society's development. All students should be given the opportunity to develop their ability to use digital technology. They should also be given the opportunity to develop a critical and responsible approach to digital technology, in order to see opportunities and understand risks as well as to evaluate information. The education will thus help students develop *digital competence*. (Skolverket, 2017a, p. 9)

Earlier on the same page, the effects of digitalization on the individual and the society are stressed in the following sentences (revisions in bold):

> The students should be able to orient themselves **and act** in a complex reality with an extensive flow of information, **increased digitalization** and a fast pace of change. (Skolverket, 2017a, p. 9)

The ability of students to act in a complex reality and to critically review information has been added and the role that digitalization is seen to have is also stressed.

Revisions in the first two chapters mainly outline the societal effects of digitalization. The responsibility of teachers and headmasters to make sure that all students have the opportunity to develop an understanding of ethical and moral issues is also stressed. In chapter two, the responsibility of the school, the headmaster and the teachers are outlined. The school is responsible for the students having certain knowledge and being able to do certain things once they complete their compulsory education. Adjustments have been made to one of these responsibilities (revisions in bold):

[2] The Craft subject in Sweden is divided into two: Needlework and Woodwork, and at primary level (up to year 6) all students have lessons in both craft subjects. At the lower secondary level, the students chose one of the subjects.

> (The student…) is able to use **both digital tools and media and other tools** when searching for knowledge, **processing information, solving problems**, creating, communicating and learning (Skolverket, 2017a, p. 13)

The expression "both digital tools and media and other tools" as well as "both with and without digital tools" is a common addition that was made in the revisions throughout curricula. In earlier versions of the curriculum, it instead referred to "modern technology". Being able to handle the flow of information and using tools for problem-solving was added to indicate what the student should be able to do with the tools, whether digital or not.

When it comes to revisions in the different subjects, changes relating to the aspects outlined by the National Agency for Education (Skolverket, 2017a) have been made to a different extent in the different subjects. Revisions aiming to develop students' understanding of how digitalization affects society as well as developing a critical and responsible approach were mainly made within the subject of Social Science. In Civics, for example, the following sentence has been added in the subject's aim:

> Students should be given the opportunity to understand the significance of digitalization for societal development and for personal integrity. (Skolverket, 2017a, p. 218)

In the subject of Swedish and Swedish as a second language, the students' ability to act responsibly in online environments have also been added as part of the core content with additions such as:

> Acting responsibly when communicating in digital and other media and in different contexts. (Skolverket, 2017a, p. 255)

Problem-solving is mainly addressed in the subjects of Mathematics and Technology, often in connection to additional core content about programming. However, aspects relating to the ability to convert ideas into action are also stressed by the revisions in Social Science, Swedish, and Swedish as a second language, with additions stating that students should act in certain ways, often responsibly and ethically.

To be able to use and understand digital tools and media is the aspect that is most prominent in the revisions and permeates changes in all subjects. In an analysis of the revisions made in the syllabus of the different subjects, 72% or the revisions could be classified as concerning the use of digital tools (Godhe, Magnusson, & Sofkova Hashemi, 2019). This points to a view of digitalization as primarily a matter of using digital tools extensively and increasingly, which could be seen as mirroring what Street (1995) described as an autonomous model of literacy, where literacy is regarded as a technical skill, rather than a social practice. However, about 13% of the revisions (Godhe el al., 2019) concern societal aspects and the development of a critical and responsible approach such as shown in the excerpt above from the subject of Civics. In line with what Krumsvik (2008) pointed out, this, as well as a focus on students ability to take action in society (second and fifth quote above), could be regarded as a distinct interpretation of digital competence that incorporates aspects of digital bildung by emphasizing societal aspects and a critical approach to the digitalization of society and education.

3.2. Denmark

In the Danish curriculum, IT and Media is the term used rather than digital competence. IT and Media is one of three interdisciplinary themes outlined in the Danish curricula (UVM, 2018a, 2018b). The other two themes are Innovation and entrepreneurship, and Language development. The word competence is used in the learning outcomes (*kompetencemål*) which are specified for each subject (UVM, 2018a) but not for the interdisciplinary themes. The interdisciplinary themes are supposed to be integrated into teaching and they are also incorporated into each subject.

In the guidelines for the IT and Media theme, IT is defined as information technology for collecting, processing, storing, and spreading information while Media is defined as digital media, meaning digitally based methods and environments for information, communication, learning, and entertainment (UVM, 2018b). In an educational perspective, the theme focuses on both technology and communication. IT and Media competence is regarded as essential to be able to actively take part in a mediatized and digitalized society since citizens need to be able to use and understand IT and Media's influence on society in order to reflect on both their own use of social media and how individual and common goals can be achieved through media.

IT and Media competence concern the ability to communicate through different media, find and share information digitally, create content and participate in social processes through IT and Media. Multimodal productions are said to create opportunities for student learning, but for this to happen students need to have the competence to use multimodal resources.

Four possible roles for students to take when working with IT and Media in different subjects are outlined. Students can be; critical investigators, analytical receivers, creative producers, or responsible participants (UVM, 2018b). These roles are regarded as fluid and are developed throughout the learning process so that students' positions may vary and expand during the process. As a critical investigator, the students' ability to find, organize, choose and critically examine information is in focus. The students' ability to analyze the message and the senders' intention is central when the student is being an analyt-

ical receiver. The ability to analyze multimodal compositions is highlighted here as well as in the third role as a creative producer. To be a creative producer the student needs to be competent in creating digital productions where digital tools are used creatively and where the message, and which modes to use, is adapted to the receiver. The fourth role, responsible participant, concerns communicative competences such as online cooperation and knowledge sharing. The student needs to take ethical aspects into consideration as well as the copyright of digital material. In the description of these roles, examples are also given in relation to the learning outcomes (*kompetencemål*) in different subjects.

The focus in the Danish curriculum is to a large extent on communication where the ability to use technology is seen as a prerequisite. What is emphasized is the students' ability to participate actively, creatively, and responsibly, both as a consumer and a producer, in digital communication. Digitalization is to a large extent conceptualized along the lines of Streets ideological model of literacy where how to engage in different social practices is in focus. In a sense, the use of the term IT and Media allows for two slightly different conceptualizations where IT mainly concerns the use of tools while Media relates to communication and broader issues connected to society and digital bildung.

3.3. Finland

In the Finnish curriculum, which came into effect in 2016, seven multifaceted competences are seen as complementary to traditional school subjects (Utbildningsstyrelsen, 2014). The need for these multifaceted competences results from global changes which mean that in order to be an active citizen, broad competences are needed which go beyond and bridge scientific subjects (p. 18). These competences should permeate all subjects and aim to develop the students understanding of themselves, their strengths as well as ways to develop and self-evaluate. Two of these competences are Digital Competence and Multiliteracies (*multilitteracitet*). As mentioned earlier, the concept of multiliteracies derives from the New London Group (1996) and stresses the importance of both linguistic and cultural diversity.

In the Finnish curriculum, Multiliteracies broadens the notion of what a text is to include verbal, visual, auditive, numerical, and kinetic sign systems, which closely relates to the socio-semiotic view on languages and research argued for by for example Kress (2010) and Jewitt (2006). To have Multiliteracy competence involves being able to search, combine, redesign, produce, present, and critically evaluate information in different forms and contexts, using a variety of tools (Utbildningsstyrelsen, 2014, p. 21). Moreover, it involves developing critical thinking and learning how to learn. Reading incorporates both traditional reading environments as well as multimedia ones, where digital tools are used in several ways. Multimodal teaching materials have to be used and the students should be given the possibility to understand cultural associations between the texts.

Digital competence is regarded as both a tool for learning and the object of learning. The description of digital competence focuses on digital tools and the principals of how to use the digital tools and how they work, as well as how pupils should develop their practical digital competence when creating their own products. Moreover, the pupils should be given guidance on how to use the tools responsibly, ergonomically, and safely, with pupils being taught how to use the tools creatively and for carrying out investigations as well as when communicating and creating networks. Digital Competence is considered to be important for citizens, both in its own right and as part of Multiliteracies (Utbildningsstyrelsen, 2014, p. 21). Even though Multiliteracies and Digital Competence are two separate competences in the Finnish curriculum, Digital Competence is simultaneously written about as being a part of Multiliteracies since it is conceptualized as concerning the use of digital tools while the focus in Multiliteracies is on broadening the notion of what a text is, students' ability to search for and evaluate text, and the development of critical thinking.

Going back to Street's (1995) definition of two models for literacy, the two competences, Multiliteracies and Digital Competence, both incorporate and divide the two models since Digital Competence is conceptualized as mainly being a technical skill, i.e. the autonomous model, whereas Multiliteracies concerns literacy as a social practice. The relation between the competences is slightly ambiguous since Digital Competence is a competence in its own right but also said to be part of multiliteracies. This indicates that digitalization as a technical skill forms a part of social practices and hence is subordinate. Relating to the concept of Multiliteracies, as used in the curricula and by the New London Group (1996), diversity in the Finnish curriculum mainly concerns diversity in language and texts, whereas cultural diversity and multiplicity are only briefly mentioned. Moreover, the term is written in the singular in the Finnish curriculum (*multilitteracitet*), thereby losing its original double plural form.

3.4. Norway

In the Norwegian curriculum (Utdanningsdirektoratet, 2017, 2018) five basic skills (*ferdigheter*) are outlined; digital skills, verbal skills, being able to read, count, and write. These basic skills are incorporated into the competence goals defined for each subject and are also seen as necessary tools for learning and development and a pre-requisite for students to be able to show their competence. The word competence is used in connection to the different subjects and the goals for students to reach (*kompetansemål*). Competence is defined as:

> The ability to acquire and use knowledge and skills to master challenges and solve assignments in known and unknown contexts and situations. Competence

> implies understanding and the ability to reflect and think critically. (Utdanningsdirektoratet, 2018, p. 11)

Even though the word *bildung* is not used, the definition of competence in the Norwegian curricula focuses on critical abilities commonly associated with *bildung*.

In the description of digital skills as a basic skill (Utdanningsdirektoratet, 2017, p. 3), digital skills are conceptualized as being the ability to acquire and process information, creatively using digital resources and to communicate and interact with others in digital environments. Moreover, it involves being able to appropriately and sensibly use digital resources and develop digital judgement through knowledge and strategies for internet use. Furthermore, digital skills are an important skill for learning and actively partaking in an ever-changing society and working life. The digital development is in the description said to have changed the premises for reading, writing, counting, and verbal expressions, thereby changing the learning processes and working methods but also raising the demands for sound judgement (Utdanningsdirektoratet, 2017, p. 3).

Within the basic digital skills, five skill areas are outlined; using and understanding, finding and managing, producing and processing, communicating and interacting, and the exercise of digital judgement (Utdanningsdirektoratet, 2017, pp. 3–4). Using and understanding concern digital resources and how to navigate in and outside of networks, safeguarding information and data. Finding and managing focuses on the ability to interpret and evaluate information, being critical and referring to sources. Information may consist of texts, sound, images, videos, symbols, and data. Producing and processing creatively using digital resources involves creating new digital products and developing or reusing existing ones. Digital interaction entails using digital resources for planning, organizing, and performing learning activities together with others through sharing and co-writing. Exercising digital judgement means following rules to protect one's privacy and being considerate to others' online. This can be done by using strategies to avoid unwanted situations and also by critically reflecting on one's own ethics and values online and in social media. Five different levels are outlined for each skill area but from this framework document (Utdanningsdirektoratet, 2017) it is not clear how they connect to different subject and learning outcomes (*kompetansemål*).

Comparing the earlier framework for digital skills (Utdanningsdirektoratet, 2012) with the current one, in the previous version there is an emphasis on using digital tools, media and resources, while the focus in the later version has shifted towards evaluating digital sources and critically engaging in digital environments (Utdanningsdirektoratet, 2017). For example, in the early version, digital tools, media, and resources should be used to search for, navigate, categorize, and interpret digital information appropriately and critically. In the newer version, the same competence area is described as being able to process, interpret, and evaluate information from digital sources.

The conceptualization of digital skills in the Norwegian curriculum resembles how digital competence is conceptualized in the Swedish curricula. However, it differs in that it is described as being one of five basic skills and hence on par with literacy and numeracy which is not the case in the Swedish curricula. Compared to how digital skills are conceptualized in earlier versions of the curricula, there is a shift from a focus on tools to a focus on social practices in digital environments. Relating to Street's models of literacy, this shift indicates a shift of models from the autonomous model towards the ideological model.

4. Conclusion and Discussion

Different terms are used in the national curricula of the Nordic countries when addressing how compulsory education can prepare students for living and working in a digitalized society. In Finland, Digital Competence is used in combination with Multiliteracies, while the Norwegian curriculum uses digital skills (*ferdigheter*) and IT and Media are used in Denmark. Digital competence is used consistently only in the Swedish curricula. However, apart from in this case, the term competence is not used elsewhere in the Swedish curricula, whereas both the Danish and the Norwegian curricula use competence when describing the goals that students need to achieve in different subjects. In all four countries, the area of knowledge that is described as connecting to these terms is supposed to be integrated into school subjects. Since this analysis has not taken into account the syllabi for different subjects, conclusions cannot be drawn on how, or to which extent, this is done.

In Denmark, IT and Media is regarded as an interdisciplinary theme, and in Finland, Multiliteracies and Digital Competence are regarded as complementary to school subjects. Norway instead sees digital skills as a basic skill on a par with reading and writing. The status of digital competence in the Swedish curricula is not as clearly defined as in the other countries, but recent revisions are supposed to support the development of students' digital competence and revisions are made both in the general part of the curriculum and in the syllabi of some subjects.

The Finnish curriculum is the only one that specifically refers to literacy, although to multiliteracies rather than digital literacies. Critical literacy is also briefly mentioned in the explanation of Multiliteracies. Diversity and critical aspects in relation to meaning-making are connected to Multiliteracies in the Finnish curriculum while handling of technology is a part of Digital Competence. Similarly, in the Danish curriculum, IT mainly concerns technological aspects, while Media focuses on communication in different environments.

Communication and the handling of information form part of the terms used in all curricula and connects

to aspects of literacy as a social practice. How to communicate and handle information in different digital environments, as well as multimodal aspects of texts, are described as being part of what students should learn throughout their education. Aspects of critical digital literacy can be found when broader social, political, economic, and technical issues are included in the conceptualization of the terms. Moreover, the conceptualizations incorporate being critical to the effects of digitalization in society, thereby breaking with common definitions of competence that connect it to effective functioning in different environments (Le Deist & Winterton, 2005). The incorporation of broader societal issues as well critical abilities in the terms used in curricula to describe what young people of the Nordic countries should learn during their compulsory education can be seen as a connection to *bildung* and indicates a certain Nordic interpretation of how digital literacy and competence are conceptualized.

Comparing curricula from different countries is challenging since the way they are written and organized differ and while I have some knowledge of historical aspects in the Swedish context, this knowledge is more limited within the other contexts. The scope of this article does not allow for an in-depth analysis of all four curricula, hence this is an area where further research is needed. Analysing and comparing syllabi for different subjects and comparing Nordic curricula to curricula in other parts of the world, are other interesting areas that need to be investigated further.

Summing up, the terms used in connection to students' digital literacy or competence, are in the Nordic curricula conceptualized in a broad sense where societal issues and a critical approach are emphasized. In that sense, Krumsvik's (2008) statement that digital competence takes on a particular meaning in Nordic countries, influenced by the notion of *bildung*, appears to be detectable within the curricula of all countries. Since digital *bildung* emphasizes broader societal issues and critical aspects it involves much more than the competent use of digital tools. Though competence or literacy as a technical skill is mentioned in the curricula, societal issues and the need for critical thinking is accentuated. Moreover, a shift appears to be taking place where students' production, rather than perception, is emphasized (Elf et al., 2018) and where digital literacy or competence as a technical skill is taken over by conceptualizations that stress the importance of being aware of both the opportunities and the risks present in a digitalized society, in order to become a responsible citizen.

Acknowledgments

I would like to thank Sylvana Sofkova Hashemi and Petra Magnusson for ideas and inspiration in connection with the analysis of the Swedish curriculum and work that we have done together previously. I would also like to thank the Department of Education, Communication and Learning at Gothenburg University for financial and professional support.

Conflict of Interests

The author declares no conflict of interests.

References

Ala-Mutka, K., Punie, Y., & Redecker, C. (2008). *Digital competence for lifelong learning* (No. 48708). Seville: JRC. Retrieved from http://ftp.jrc.es/EURdoc/JRC48708.TN.pdf

Barton, D., & Hamilton, M. (1998). *Local literacies*. London: Routledge.

Bezemer, J., & Kress, G. (2016). *Multimodality, learning and communication: A social semiotic frame*. London: Routledge.

Biesta, G. (2002). How general can buildung be? Reflections on the future of a modern educational ideal. *Journal of Philosophy of Education*, *36*(3), 377–390.

Broadband Commission. (2017). *Working group on education—Digital skills for life and work*. Paris: UNESCO. Retrieved from http://unesdoc.unesco.org/images/0025/002590/259013e.pdf

Carretero, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use* (No. 106281). Seville: JRC. Retrieved from publications.jrc.ec.europa.se/repository/bitstream/JRC106281/web-digcomp2.1pdf_(online).pdf

Elf, N., Gilje, Ø., Olin-Scheller, C., & Slotte, A. (2018). Nordisk status og forskningsperspektiver: Multimodalitet i styredokumenter og klasserumsrumspraksis [Nordic status and research perspective: Mulitmodality in policy documents and classroom practices]. In M. Rogne & L. Rune Waage (Eds.), *Multimodalitet i skole- og fritidstekstar. Ein vitskapleg antologi* [Multimodality in school- and downtime texts. A scientific anthology] (pp. 71−104). Bergen: Fagbokforlaget.

Erstad, O., & Amdam, S. (2013). From protection to public participation, *Javnost–The Public*, *20*(2), 83–98. https://doi.org/10.1080/13183222.2013.11009115

European Commission. (2018). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions* (Working Paper, COM(2018), No. 22). Brussels: European Commission. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0012&from=EN

European Parliament. (2006). *Recommendation of the European parliament and of the council* 2006/962/EG. Strasbourg: European Parliament. Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32006H0962

Gilster, P. (1997). *Digital literacy*. New York: Wiley Com-

puter Publications.
Godhe, A.-L., Magnusson, P., & Sofkova Hashemi, S. (2019). *Adequate digital competence: Exploring revisions in the Swedish national curriculum*. Manuscript submitted for publication.
Gustavsson, B. (2009). *Utbildningens förändrade villkor: Nya perspektiv på kunskap, bildning och demokrati* [New perspectives on knowledge, bildung and democracy]. Stockholm: Liber.
Jewitt, C. (2006). *Technology, literacy and learning: A multimodal approach*. London: Routledge.
Johnson, D., & Kress, G. (2003). Globalisation, literacy and society: Redesigning pedagogy and assessment. *Assessment in Education: Principles, Policy & Practice*, *10*(1), 5–14.
Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. London: Routledge.
Krumsvik, R. J. (2008). Situated learning and teachers' digital competence. *Education and Information Technologies*, *13*(4), 279–290.
Lankshear, C., & Knobel, M. (2008). *New literacies: Everyday practices and classroom learning*. Maidenhead: Open University Press.
Lea, M. R. (2013). Reclaiming literacies: Competing textual practices in a digital higher education. *Teaching in Higher Education*, *18*(1), 106–118. https://doi.org/10.1080/13562517.2012.756465
Le Deist, F. D., & Winterton, J. (2005). What is competence? *Human Resource Development International*, *8*(1), 27–46.
New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, *66*(1), 60–92.
OECD. (2016). *Skills for a digital world: Policy brief on the future of work*. Paris: OECD. Retrieved from www.oecd.org/els/emp/Skills-for-a-Digital-World.pdf
Pangrazio, L. (2017). Reconceptualising critical digital literacy. *Discourse: Studies in the Cultural Politics of Education*, *37*(2), 163–174.
Resnick, L. B. (1987). Learning in school and out. *Educational Researcher*, *16*(9), 13–20.
Scribner, S., & Cole, M. (1981). *The psychology of literacy*. Cambridge: Harvard University Press.
Sefton-Green, J., Nixon, H., & Erstad, O. (2009). Reviewing approaches and perspectives on "digital literacy". *Pedagogies: An International Journal*, *4*(2), 107–125.
Selwyn, N. (2013). *Education in a digital world: Global perspectives on technology and education*. New York: Routledge.
Selwyn, N. (2016). *Is technology good for education?* Cambridge: Polity Press.
Skolverket. (2017a). *Läroplan för grundskolan samt för förskoleklassen och fritidshemmet* [Curriculum for the compulsory school, preschool class and school-age educare]. Retrieved from https://www.skolverket.se/undervisning/grundskolan/laroplan-och-kursplaner-for-grundskolan/laroplan-lgr11-for-grundskolan-samt-for-forskoleklassen-och-fritidshemmet
Skolverket. (2017b). *Få syn på digitaliseringen på grundskolenivå–Ett kommentarmaterial till läroplanerna för förskoleklass, fritidshem och grundskoleutbildning* [Noticing digitalization at compulsory education level—Commentary to curricula for preschool class, school-age educare and compulsory education]. Retrieved from https://www.skolverket.se/publikationer?id=3783
Spante, M., Hashemi, S. S., Lundin, M., & Algers, A. (2018). Digital competence and digital literacy in higher education reserach: Systematic review of concept use. *Cogent Education*, *5*(1). https://doi.org/10.1080/2331186X.2018.1519143
Street, B. (1995). *Social literacies: Critical approaches to literacy in development, ethnography and education*. London: Longman.
Street, B. (1998). New literacies in theory and practice: What are the implications for language in education? *Linguistics and Education*, *10*(1), 1–24.
Säljö, R. (2010). Digital tools and challenges to institutional traditions of learning: Technologies, social memory and the performative nature of learning. *Journal of Computer Assisted Learning*, *26*, 53–64.
Säljö, R. (2012). Literacy, digital literacy and epistemic practices: The co-evolution of hybrid minds and external memory systems. *Nordic Journal of Digital Literacy*, *7*(1), 5–19.
Søby, M. (2008). Digital competence—From education policy to pedagogy: The Norwegian context. In C. Lankshear & M. Knobel (Eds.), *Digital literacies: Concepts, policies and practices* (pp. 119–150). New York: Peter Lang.
Undervisningsministeriet. (2018a). *Introduktion til Fælles mål* [Introduction to common goals]. Retrieved from https://www.emu.dk/modul/introduktion-til-fælles-mål
Undervisningsministeriet. (2018b). *It og medier–vejledning* [Guidance to IT and media]. Retrieved Dec 2018 from https://www.emu.dk/modul/it-og-medier-vejledning
Utbildningsstyrelsen. (2014). *Grunderna för läroplanen för den grundläggande utbildningen 2014* [The foundation for the curriculum for elementary education]. Retrieved from https://www.oph.fi/lp2016/grunderna_for_laroplanen
Utdanningsdirektoratet. (2012). *Rammeverk for grunnlegende ferdigheter* [Framework for basic skills]. Retrieved from https://web.archive.org/web/20140209161842/http://www.udir.no/Upload/larerplaner/lareplangrupper/RAMMEVERK_grf_2012.pdf?epslanguage=no
Utdanningsdirektoratet. (2017). *Rammeverk for grunnlegende ferdigheter* [Framework for basic skills]. Retrieved from https://www.udir.no/laring-og-trivsel/lareplanverket/grunnleggende-ferdigheter/rammeverk-for-grunnleggende-ferdigheter/

Utdanningsdirektoratet. (2018). *Overordnet del av læreplaneverket* [Overall part of curriculum]. Retrieved from https://www.udir.no/laring-og-trivsel/lareplanverket/overordnet-del/

About the Author

Anna-Lena Godhe holds a PhD in Applied Information Technology and her research interests revolve around the use of digital technologies within language education. She has also been involved in research on a MOOC created by and for teachers. Another area of research that Anna-Lena has worked in concerns concepts such as digital literacy, digital competence, and data literacy. She has also been involved in research comparing the conceptualization of digital literacy in different parts of the world.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 36–46
DOI: 10.17645/mac.v7i2.1987

Article

Multidimensional Approaches to Examining Digital Literacies in the Contemporary Global Society

Kewman M. Lee [1,*], Sohee Park [2], Bong Gee Jang [3], and Byeong-Young Cho [4,5]

[1] Reading, Foundations and Technology, Missouri State University, Springfield, MO 85687, USA; E-Mail: kewmanlee@missouristate.edu
[2] Chadwick School, Palos Verdes Peninsula, CA 90274, USA; E-Mail: ipadsohee@gmail.com
[3] Reading and Language Arts, Syracuse University, Syracuse, NY 13244, USA; E-Mail: bojang@syr.edu
[4] School of Education, University of Pittsburgh, Pittsburgh, PA 15213, USA; E-Mail: choby@pitt.edu
[5] Learning Research and Development Center, University of Pittsburgh, Pittsburgh, PA 15213, USA; E-Mail: choby@pitt.edu

* Corresponding author

Submitted: 22 January 2019 | Accepted: 26 April 2019 | Published: 11 June 2019

Abstract
Literacy scholars have offered compelling theories about and methods for understanding the digital literacy practices of youth. However, little work has explored the possibility of an approach that would demonstrate how different perspectives on literacies might intersect and interconnect in order to better describe the multifaceted nature of youth digital literacies. In this conceptual article, we adopt the idea of theoretical triangulation in interpretive inquiry and explore how multiple perspectives can jointly contribute to constructing a nuanced description of young people's literacies in today's digitally mediated global world. For this purpose, we first suggest a triangulation framework that integrates sociocultural, affective, and cognitive perspectives on digital literacies, focusing on recent developments in these perspectives. We then use an example of discourse data from a globally connected online affinity space and demonstrate how our multidimensional framework can lead to a complex analysis and interpretation of the data. In particular, we describe the substance of one specific case of youth digital literacies from each of the three perspectives on literacy, which in turn converge to provide a complex account of such literacy practices. In conclusion, we discuss the promise and limitations of our integrative approach to studying the digital literacy practices of youth.

Keywords
Border-Crossing Discourse; digital literacies; epistemic cognition; self-determination theory; theoretical triangulation; youth digital literacies

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

Literacy scholars have offered compelling theories and methodologies for understanding youths' digital literacy practices (e.g., Alvermann, 2010; Baker, 2010; Coiro, Knobel, Lankshear, & Leu, 2008). However, the goals and purposes, methodological considerations, and strengths and limitations of literacy studies vary according to the views that scholars take of what literacy means. For example, if one sees literacies as practices that are socially situated (Gee, 1990; Street, 1995), then one may pay attention to how the members of a certain social group represent, negotiate, and formulate their stances and identities to meet their goals and interests (e.g., Latinx social groups in Jiménez, 2000, and Moll, Amanti, Neff, & Gonzalez, 1992; urban social groups in Moje & Lewis, 2007, and Morrell, 2004; transnational communities in Jiménez, Smith, & Teague, 2009, and Skerrett, 2015). On

the other hand, if others find the meaning of literacy in the way that an individual mind works, they may focus on the intricate cognitive processes of the individual engaged in reading, writing, thinking, and reasoning in response to texts of different contents and forms (e.g., the functions of reader schema in Anderson & Pearson, 1984; the process of mental model-building in Kintsch, 1988; writers' cognitive acts in response to rhetorical contexts in Flower & Hayes, 1981).

Similarly, perspectives matter in literacies inquiries situated in the twenty-first-century digital world. Researchers who take sociocultural views of digital literacies interpret what can be afforded and constrained in a variety of online social groups and how digital communities are initiated, formed, and developed toward creating a space for the engagement and participation of youths (e.g., digital media and popular culture in Alvermann, 2010; video gaming communities in Gee & Hayes, 2010; globally connected online literacy practices in Hull, Stornaiuolo, & Sahni, 2010, and Hull, Stornaiuolo, & Sterponi, 2013; multilingual literacies in digitally mediated transnational online contexts in Lam & Rosario-Ramos, 2009). On the other hand, other scholars whose perspectives emphasize cognitive aspects of individuals' digital literacy practices may describe how readers and writers engage in information processing and meaning construction and what individual difference factors come into play in their cognitive engagement (e.g., information-seeking processes using web search engines in Coiro & Dobler, 2007; strategic processing of multiple sources available on the internet in Afflerbach & Cho, 2009).

One thing we note here is the possibility that different perspectives could inform, in both distinctive and collective ways, how we examine the multifaceted nature of digital literacies practices. For example, sociolinguistic approaches may help us understand digital forms of discourses within the online space through which youths interact with others who share a common interest in popular culture—for example, video games or fanfiction. Researchers taking these approaches may be highly attentive to noticing and interpreting features of such discourses as social semiotic representations of the youths' emerging identities as experts of the specific popular culture developed through their digital interactions. Further, a closer examination of adolescent writers' motivation demonstrated through their remixing practices in this online space, as well as the capacities and skills employed in such remixing, could help us ponder foundational processes in meaning-making and text construction. While the former approach (i.e., sociolinguistics) helps us explore social phenomena broadly, the latter perspectives (i.e., individual cognition and motivation) certainly assist us in examining a specific individual's cognitive process in digital literacy practices within the social phenomena. Different perspectives substantiate different research foci even on a specific digital literacy practice, but a more integrative methodological approach that interconnects multiple theories and perspectives could help us see things more insightfully. Although different perspectives (and the underlying epistemologies) may never be reconciled completely, a multilayered analysis of the same case could offer useful insights that we might not be able to gain otherwise from a single, limited perspective. Therefore, while we value the distinctive trajectories and boundaries of different perspectives on and inquiries into literacies, we also creatively explore ways of maximizing the benefits of those theories used together.

We found in our review of relevant research literature that there has been a lack of discussion of multidimensional approaches that exploit different theories and perspectives in order to examine the multifaceted practices of digitally literate youth. In this article, we adopt the idea of theoretical triangulation in interpretive inquiry (Denzin, 1978, 2012) and explore how theories that take different perspectives can be intermingled to construct a coherent description of the digital literacies in which young people are engaged. We instantiate a case demonstrating how a multidimensional approach could be generated and used at the intersection of Border-Crossing Discourse (BCD) from a sociocultural perspective, self-determination theory (SDT) from an affective perspective, and the notion of epistemic cognition (EC) from a cognitive perspective. These theories were selected not only because they are rooted in distinctive perspectives on literacies and learning, but also because they offer relatively newly developed frames and tools which are useful for examining digital literacies. We note that our intention is to showcase only one of numerous possibilities of theoretical triangulation toward interpreting digital literacies through a multidimensional approach.

2. Multidimensional Approaches to Digital Literacies

2.1. Diversified Theories of Digital Literacies in the Twenty-First Century

An important scholarly discourse in recent decades concerns two broad understandings of digital literacies: (a) the forms of literacies afforded by new digital technologies; and (b) literacies as socially situated practices in a digital space (Lankshear & Knobel, 2006, 2011). For example, Leu, Kinzer, Coiro, Castek and Henry (2013) proposed a dual-level theory of new literacies that accounts for the changing nature of literacy contexts and pedagogical practices for helping students learn the capacities and mindsets involved in digital literacies. One side of this framework includes (lowercase) new literacies that subsume strands of research on the specific area of knowledge, skills, and attitudes newly required in a digitally mediated information space, such as those on the internet. One strand of work under new literacies is focused on online reading comprehension (Castek, 2008; Coiro, 2003; Henry, 2006), with a special interest

in readers' cognitive strategies to interact with information sources on the internet. The other side of the framework refers to (uppercase) New Literacies, such as new rules for engaging in socially situated digital literacy practices in online social groups, which provides accounts of ideological practices engaged in by young people (e.g., Lankshear & Knobel, 2014). Similar to Leu et al.'s (2013) dual-level theory, Lankshear and Knobel (2006, 2011) also demonstrate new digital literacies as two kinds of "stuff"—the new technical stuff and the new ethos stuff. The former explains the influence of digital technologies on literacy practices, whereas the latter focuses on the "configuration of values," which involves "different kinds of social and cultural relations" than conventional literacies (Lankshear & Knobel, 2011, p. 29).

The binary trend of digital literacy research is evident. From sociocultural perspectives, some advocates of New Literacy Studies (NLS) stress socio-spatial approaches to digital literacies and the concept of "space" (Leander, Phillips, & Taylor, 2010; Mills & Comber, 2013, 2015; Moje, 2004). Stornaiuolo, Smith and Phillips (2017) develop a framework of "transliteracies" to fit literacy research to today's connected world. Pahl and Escott (2015) emphasize a material-culture approach to literacies to demonstrate the intersection between literacy practices and today's material world by attending to "artifactual literacies" (Pahl & Rowsell, 2011, 2013). Taking a global perspective, Kim (2016a, 2016b) asserts the importance of "transcultural digital literacies." Lee (2018) reimagines Gee's seminal concept of Discourse with a capital "D" in the contemporary global online world (BCD). In the tradition of psychological cognitive approaches, by contrast, literacy scholars have developed fine-grained theoretical accounts of digital reading. Coiro and Dobler (2007) explore information-seeking processes to demonstrate online reading processes. Cho, Woodward and Li (2017) use the idea of epistemic processing to examine online reading. Furthermore, literacy studies such as McKenna, Conradi, Lawrence, Jang and Meyer (2012) employ affective approaches to examine how adolescents develop their motivation to read print and digital texts in different ways. Some of the same scholars' recent work (Lupo, Jang, & McKenna, 2017) indicates that adolescents are more motivated to read digital texts for recreational purposes because of the social nature of digital environments.

Concepts of literacies have expanded as tools and environments for reading and writing have taken increasingly complex forms. However, it is impossible to gain a complete understanding of contemporary literacy practices using a theoretical dichotomy. Although theories of digital literacies have become subdivided, specified, and diversified, it is obvious that literacies in reality may not be understood from either psychological (new literacies; technical stuff) or sociocultural (new literacies; ethos stuff) perspectives alone.

We believe that the somewhat divided landscape of research and theories can offer an important opportunity for us to see that diversified theoretical developments, in the current digital world, may broaden the possibilities of multidimensional approaches to the study of digital literacies. In this light, the notion of theoretical triangulation offers a useful framework for the exploration of multidimensionality in digital literacies. Triangulation was introduced as a mathematical method for determining the distances and relative positions of points using the laws of trigonometry. Denzin (1970) started using the term in the social sciences to refer to a combination of methodologies in the qualitative study of the same phenomena. Nowadays, it has expanded to include the mixing of qualitative and quantitative methods in multiple phases of research (Denzin, 2012). Denzin described theory triangulation as a way of investigating empirical materials using multiple theories and perspectives that could reveal unnoticed aspects of the data, allowing the construction of more sophisticated accounts of the observed phenomenon, event, or problem (Denzin, 1978). Theoretical triangulation informs our inquiry into literacy practices and processes, as we aim to demonstrate how adolescents' digital literacies can be interpreted differently and coherently by three different perspectives on literacy practices.

In this article, we suggest one possibility for using diversified theories of digital literacies multidimensionally. We use data from our previous work (Lee, 2018) to present an example analysis of youth digital literacies that takes a multidimensional approach. The case in question was previously analyzed on the basis of the theoretical concept of "Border-Crossing Discourse" and by discourse analysis (Gee, 2014). To develop a deeper understanding of the case, we chose two complementary perspectives on literacies and learning: SDT and EC. We first outline these three contemporary theories. We then conduct our case analysis as an example of the possibility of seeing from multidimensional approaches.

We note that our choice of particular theories and perspectives suggests only one possible combination of varied perspectives, as an example of potential multidimensional approaches, anticipating how they could be triangulated into a focused case analysis of youth digital literacies. The specific approach we adopt from each of the three dimensions is based on our review of the recent literature (e.g., Baker, 2010; Coiro et al., 2008; Tracey & Morrow, 2017). We believe that this attempt may better capture the complexities and nuances of digital literacies practices. In the following section, we discuss each of the three perspectives briefly.

2.2. Selected Theoretical Views: BCD, SDT, and EC

Our first consideration is a theory informed by NLS that focuses on Gee's work on Discourses with a capital "D" (hereafter, big-D Discourse). In particular, the recently developed concept of *BCD*, grounded in a theory of big-D Discourse, is a powerful tool for examining youth literacies in online societies globally. According to Gee (2015),

big-D Discourse does not simply mean "discourse" as in language in use or stretches of language longer than a sentence. Rather, it is defined by the ways of behaving, interacting, valuing, thinking, believing, speaking, and often reading and writing that are accepted as instantiations of particular identities by specific social groups (Gee, 2015, p. 7). That is, the literacy practices of a certain social group are situated within a certain Discourse.

The concept of BCD (Lee, 2018; Lee & Gee, 2018) is a reimagined version of big-D Discourse that has been identified within digitally oriented online social groups across linguistic, social, cultural, and physical boundaries. Lee (2018) called these groups "global online affinity spaces." A global online affinity space is an online space where people who share a specific affinity congregate from all over the world. Inevitably, these spaces become more socially, linguistically, and culturally diverse than other societies. At the same time, strong solidarity based on a shared interest bonds the members of these groups tightly. This solidarity helps diverse people with diverse identities communicate across their social, cultural, and linguistic differences. In literacy studies, the concept of BCD suggests a theoretical viewpoint for exploring digitally situated social languages and literacy practices in global online affinity spaces.

Another consideration is motivational perspectives. We find SDT particularly valuable as a framework for looking at autonomous motivation with relatedness. Beyond the traditional distinction between intrinsic and extrinsic motivation, SDT qualitatively differentiates between types of motivation by situating motivation along a continuum of self-determination or relative autonomy (Ryan & Deci, 2000). This theoretical differentiation may help us understand why and how individuals in global online affinity spaces participate spontaneously in these social groups in complicated global world.

Deci and Ryan (2008) and Gagné and Deci (2005) explain how SDT distinguishes between autonomous and controlled motivation. Autonomous motivation comprises both intrinsic regulation—engaging in a behavior for one's own satisfaction or enjoyment—and identified regulation—when people have identified with an activity's value and, ideally, have integrated it into their sense of self. Controlled motivation, by contrast, has two subtypes: external regulation, or a sense of pressure from external causes shaping one's actions, and introjected regulation, a sense of having to act from internal pressure. SDT claims that humans exercise these different types of motivation or regulation to fulfill their basic psychological needs for competence, autonomy, and relatedness. Autonomy involves acting with a sense of volition. Competence is the experience of behavior as effectively enacted. Relatedness is feeling connected with contexts in which one experiences a sense of belonging.

Finally, we take the cognition of digital youth into account, as we want to understand how thinking and reasoning are situated within a specific context of literacy practice. We value the recent development of research on the EC of learners, which is known to guide their cognitive processes and behaviors in completing literacy tasks (Hofer, 2004; Kitchner, 1983; Sandoval, Greene, & Bråten, 2016). In our view, digitally literate youths' reasoning, when processing sources of information, remixing ideas and perspectives, and crafting and sharing their own artifacts, can be explained better by how they respond to and interact with the epistemic value of the internet. The internet presents a textual space for adolescents, who actively sense-make regarding who is authorized to create a text. In a classroom, students' beliefs about and attitudes toward what a text means are constrained by a context in which they have to follow routines and rules set by others, including teachers, textbook authors, and test developers. Consequently, students may believe that what they can do in reading is mostly gathering information to give a correct answer to a given question, and what they can do in writing is producing a limited form of text with a particular structure and content expected by external authorities. Digital spaces, by contrast, may allow adolescents to take ownership of their artifacts as creators. This contextual feature makes reading and writing epistemological tasks in which adolescents, as agentive sense-makers and creative knowledge producers, (un)consciously impose their tacit views of constructive knowledge (knowledge that is constructed in "me") and active knowing (knowing as a process of active meaning-making and representation). Thus, adolescents in a digital space may seek to take the role of active knowers, making claims, consulting multiple sources, constructing evidence, and building arguments about the relevance and value of their artifacts to their target audience. Once these disparate spaces of epistemic values are recognized and experienced, readers and writers can approach their literacy work from newly informed perspectives on what they can do, must do, and must not do in those spaces.

Though these three theoretical ideas attend to different aspects of digital literacy, they are at the same time looking at some common areas. In the following section, we introduce one of our previous studies, in which the data were analyzed using the concept of BCD. Then, we attempt to interpret a sample of the same data through the lenses of SDT and EC. Finally, we discuss the value of multidimensional approaches.

3. A Case Analysis from Multidimensional Approaches to Digital Literacy Practices

3.1. Context: Asianfanfics—Digital Literacies in a Global Online Affinity Space

The more digital the world becomes, the more diverse and global many of its societies are becoming, and as a result there are many complexified social groups and social practices in the online world. Today's digital world allows social groups to exist in global online affinity spaces (Lee, 2018) where people from all over the world can con-

gregate on the basis of common interests. Inevitably, this kind of social group includes people of different linguistic, social, cultural, and national backgrounds. The social languages they use are unique and diverse to a degree unprecedented in human history, and their digital literacy practices with these languages are unique types of situated social practices.

Lee (2018) developed the concept of BCD by analyzing multimodal discourse in two such spaces. He used discourse analysis (Gee, 2014) to demonstrate how the social groups created new standards and situated meanings of social languages through the social goods in these spaces. In this article, we use the ideas of SDT and EC to explore this topic further and thus to strengthen the examination of these literacy practices.

The website www.asianfanfics.com (hereafter, Asianfanfics) is devoted to fanfiction about Asian popular culture. We use it as a concrete example from our previous work (Lee, 2018) on the unprecedented but currently typical patterns of digital literacy practices from a global online affinity space. People on Asianfanfics are deeply interested in Asian popular culture broadly; in particular, the majority of them enjoy Korean popular culture (K-pop). This site is a good example of a global online affinity space for two reasons. First, according to Jenkins, Itō, and Boyd (2015), fandom culture and geek culture are not just "sub" cultures anymore. These cultures have become a huge part of our lives, and people within these cultural communities tend to follow new digital media very quickly (Jenkins et al., 2015). Second, people from all around the world congregate on this site due to a shared interest. According to the Flag Counter program, people from at least 151 countries visit Asianfanfics. The site exemplifies current digitalized and globalized social groups very well.

3.2. Situated Meanings in Asianfanfics

Lee (2018) explored four kinds of linguistic features in this space. We focus on one of these: "creating new standards and situated meanings of social languages through social goods." To examine this feature, Lee conducted discourse analysis (Gee, 2014), which is useful for exploring linguistic phenomena and situated meanings using data of routine interactions in a specific space. In global online spaces, one of huge barriers to communication is language differences among people in the spaces. However, insiders in a specific social group typically value certain social goods, and they therefore make efforts to overcome the communication barrier through pursuing these social goods. They do so by drawing on various resources (e.g., multimodal and translingual practices), which leads to their spontaneous creation of their own social language and helps them construct and represent their identities as members of that group.

Figures 1 and 2 illustrate a typical use of social languages on Asianfanfics. Figure 1 is a part of the profile page of a young Japanese woman who is introducing the kind of fanfiction and K-pop stars she likes. Figure 2 is a comment on a specific fanfiction on the site.

In the first and second lines of Figure 1, the word "bias" is used several times. This is a common word among English speakers, but its situated meaning in the specific Asianfanfics social space—which is different

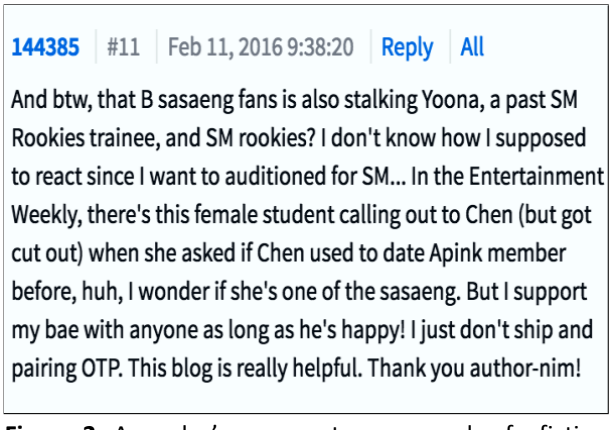
Figure 1. A selected part of a profile page introducing a page owner in Asianfanfics.

from the meaning in so-called standard English—was created there and is used routinely there. This meaning is currently Urban Dictionary's top definition for the word:

> In Kpop, the member of an idol group that is your favorite. A person may have one ultimate bias, and many other biases from other idol groups, or only have one ultimate bias. This term is derived from "having a bias towards a particular person."
>
> G-Dragon is my ultimate bias, but Key is my SHINee bias. (Urban Dictionary, n.d.)

The author uses other common words on Asianfanfics, such as "DaraGon," "RiRin," "BomBae," "KhunToria," "KyuYoung," and "KeikoPi." These are typical examples of words that insiders to Asianfanfics employ to depict K-pop stars. There are detailed processes for representing identities through these social languages and many more examples (see Lee, 2018, pp. 84–86).

Figure 2 shows a reader's comment on a work of fanfiction on Asianfanfics. Outwardly, it appears to be a paragraph of typical English. But on a closer look, it combines at least two languages. For example, in the first line, the words "sasaeng" (사생) and "Yoona" (윤아) are Korean. The last sentence uses a hybrid expression with a specific situated meaning: the Korean suffix "-nim" (님) means *honorable* or *respectable*. People in Korea routinely use it to address people in honorable positions, such as teachers, professors, judges, and religious leaders. However, no one calls a writer "author-nim," even in Korea, except Koreans who participate in Asianfanfics (there is another way to refer to an author using "-nim" in Korean). As Lee said, "In Asianfanfics, users don't refer to an author as just an author but rather as 'author-nim.' This is a kind of tacit rule and one of their social goods that everyone tries to follow" (Lee, 2018, p. 86).


144385 #11 Feb 11, 2016 9:38:20 Reply All

And btw, that B sasaeng fans is also stalking Yoona, a past SM Rookies trainee, and SM rookies? I don't know how I supposed to react since I want to auditioned for SM... In the Entertainment Weekly, there's this female student calling out to Chen (but got cut out) when she asked if Chen used to date Apink member before, huh, I wonder if she's one of the sasaeng. But I support my bae with anyone as long as he's happy! I just don't ship and pairing OTP. This blog is really helpful. Thank you author-nim!

Figure 2. A reader's comment on a popular fanfiction about K-pop stars.

Endeavors to pursue social goods within certain social groups lead to people continually creating and using the social languages in the group. Participants want to be seen as insiders, and to do so they use the social languages "spontaneously." In particular, in global online affinity spaces where culturally, linguistically, and nationally diverse people congregate, social languages develop in very dynamic and complex ways (Lee, 2018). The members also obviously acquire these social language proficiencies not from teachers and school curricula (Lankshear & Knobel, 2014), but as active participants. In the following sections, we use SDT and EC to explore the cognitive side of how they do these activities.

3.3. Why and How Do People Determine to Keep Using and Creating New Situated Meanings and Social Languages?

Within the Asianfanfics community, users from different countries feel connected to each other; they develop a sense of belonging by caring and being cared for (Gee, 2004; Lee, 2018). This sense of relatedness promotes the process of internalizing social languages and discourses as their own values. For example, in Figure 1, the girl who introduced herself as Japanese autonomously tries to use Korean, Korean-relevant, and K-pop-related language with English grammatical structures rather than Japanese on her profile page to connect with other participants. And while the autonomous motivation that many users have when they start participating in the global online affinity space may be personal and intrinsic, it may develop into more community-oriented identified regulation as they internalize the discourses shared in the community as their own practices.

In addition, as seen in Figure 2, these users are autonomous (autonomy) because they are willing to devote their time and energy to using, creating, and sharing social languages by posting new information and responding to other postings. They are competent as well (competence) because they challenge each other with their thoughts about their favorite K-pop stars and share constructive feedback with each other regarding the quality of the information they have shared (relatedness). In this regard, the Asianfanfics site clearly addresses all the three basic psychological needs (competence, autonomy, and relatedness, Deci & Ryan, 2008), which in turn promotes the users' autonomous engagement in using and sharing social languages.

3.4. How Do Epistemic Beliefs in the Popular Culture Shape the Engagement Experience of the Social Languages?

One's epistemic beliefs may not be presented explicitly to others. These beliefs rather operate implicitly as tacit knowledge but come to the surface when the knower is prompted by a self-initiated goal and need. Epistemic beliefs become realized in action within authentic contexts of meaning-making, in which knowers recognize the autonomy of their work. From this perspective, the notions of grammar, English language, and text could be reconceived. Young people's beliefs about knowledge

(what counts as knowledge) and knowing (how one comes to know) would be distinct from what they believe and bring to their work in constrained school literacy contexts.

School grammars are fixed and cannot be changed or modified by users. They offer a sort of discrete knowledge that students must memorize and be able to access and retrieve when reading and writing. What they read and write is also represented as a form of text, one written in standard language by expert readers and writers. In this context, there is little room for students to imagine their roles as text participants or analysts who can critically challenge text and language, and who can creatively mix varied language forms and grammars into a text adhering to student-created rules.

Many contrasting enactments of epistemic beliefs can be observed and interpreted in the Asianfanfics online affinity space. K-pop is rooted in Korean popular music and its commodified culture, but the real meaning of K-pop is redefined by those who engage in listening to it together, sharing reviews, and building a community in which multiple cultures and language tools are used. The languages, symbols, and meanings are reauthorized by the sign-makers, and the processes of managing such tools and resources are meticulously reviewed and examined by other members of the community (see Figure 2). In this space, young readers and writers become authorities and experts who are equipped with highly valued knowledge and skills, and who constantly monitor their processes of tool-using and meaning-making. This open, constructive epistemic community has rules and standards for making judgments on their languages and tool uses, which then drive the choice of tools and languages, the exploration of new tools and new modifications of language, and the creation of multiple opportunities to test such meaning-making tools and processes. Therefore, cognitive strategies and metacognitive controls are situated in the way readers and writers respond to their constructively negotiated grammars, languages, texts, as well as to the authorities of all intellectual products.

4. What We Learn from the Case Analysis on Youth Digital Literacies

Guided by the theoretical triangulation framework (Denzin, 1978, 2012), we have attempted in this study to interpret a digital literacies practice through three different lenses and show the advantages of multidimensional approaches. The use of three approaches—BCDs from the sociocultural dimension, SDT from the affective dimension, and EC theory from the cognitive dimension—strengthened and corroborated each of the perspectives' interpretations. The analysis exploring the situated meanings of discourse in the Asianfanfics community from the BCD perspective allowed us to identify unique structures, norms, and rules of the site's social languages. The participants have created new situated meanings of existing words (e.g., "bias") and developed new tactics for forming new words (e.g., combining the final syllables of two K-pop stars' names to indicate a pairing within a fanfic: Sandara + G-dragon = daragon).

The notion of autonomous motivation proposed by SDT is a useful conceptual framework for capturing the multifaceted nature of users' motivations: it explains why the site's users spontaneously participate in the society and continuously create their own social languages (as addressed from the BCD perspective). Readers and writers of fanfictions in the space have strong autonomous motivations (i.e., intrinsic and identified regulations) for writing the fanfics and responding to them in their own social languages. Their affinity for certain K-pop stars and the desires and fantasies they want to realize may provide the strong intrinsic regulation behind their writing. At the same time, they gain benefits by using the social languages in order to be understood by other users and mark themselves as "insiders" to other K-pop fans (Black, 2008). SDT explains this tendency—wanting to actualize a social good, in this case to be marked as an insider—through the concept of "relatedness," which is used from the motivational perspective. That is, the writers' autonomous motivation for strengthening their relatedness to others in the space fosters their using and creating the new situated meanings of the social languages of the spaces.

In addition, examining the beliefs and cognitive processes of users of Asianfanfics about their own knowledge and knowing in their online reading and writing helps us explain why and how they stick to certain social languages, contents, and/or writing formats in their fanfics. According to big-D Discourse theory, active participation in a particular affinity space lets young people acquire social language proficiencies aptly without formal education (Lankshear & Knobel, 2014). Advocates of big-D Discourse theory sometimes attempt to explain this phenomenon—the acquisition of social language proficiency by participation—through the term "figured world," which describes a space of shared values, beliefs, or faiths within a certain Discourse or "cultural model." While the BCD tries to uncover how such proficiency is acquired in terms of the characteristics of online spaces broadly, an analysis focused on EC tries to identify how a certain individual in an affinity space can, specifically and cognitively, develop social language proficiency based on each individual's epistemic beliefs in regard to the space, its contents, or the characteristics of the social group. Understanding such individual beliefs could be beneficial to develop concrete pedagogical approaches.

Figure 3 visualizes the interconnectedness of the three approaches. We compare our examination of a digital literacies practice through three different theoretical dimensions to the use of three overlapping colored lenses to observe an object. For example, when the yellow lens overlaps the blue one, the common area turns to green, and allows us to identify a new "green" object. The lenses do not change the object. Instead, they help us view the same object differently.

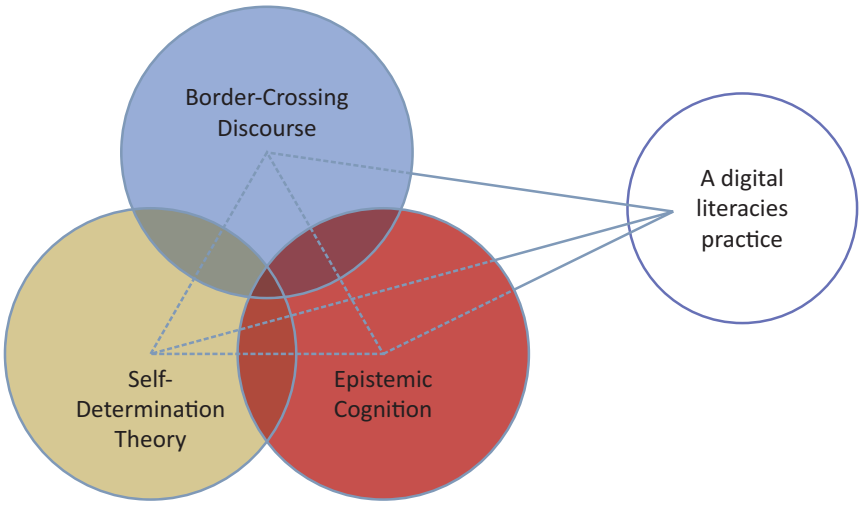


Figure 3. Interconnectedness of the three approaches.

Likewise, our three approaches help us interpret a certain digital literacies practice in a manner different from what any one approach could lead to on its own. By applying SDT and EC together, for example, we can understand the interplay between the users' epistemic beliefs and their autonomous motivation. According to Chen and Barger's (2016) review of the relationship between epistemic beliefs and motivation, people's beliefs about their knowledge and knowing drive their motivation for learning. That is, the common area between SDT and EC helps us explicate that the Asianfanfics users' belief in their authority and expertise about knowledge and knowing in the online space motivates them to belong to the community with "autonomy" and "competence" (Deci & Ryan, 2008).

Second, the shared area between SDT and BCD allows us to interpret the relationship between users' autonomous motivation and situated meanings in online affinity spaces. Although no established theory specifically addresses this relationship, a few existing studies report that participation in an affinity space is "multifaceted," including the self-directed autonomous pursuit of "relatedness" to other users (e.g., Curwood, Magnifico, & Lammers, 2013). This tendency results in the users' desire to actualize their unique "social goods," which were identified by BCD (Lee, 2018, p. 86).

In addition, the overlap between BCD and EC explains the desire to pursue the social goods in relation to the users' knowledge about the website and texts as the space and medium of their epistemic beliefs. In other words, since the users perceive the global online affinity space as involving out-of-school literacies, and they believe that they belong to a space where young readers and writers have ownership and authority of the content (Cho et al., 2017), they are willing to develop their own rules to perpetuate their figured worlds (Lee, 2018). Ultimately, combining the three different perspectives enables us to speculate about the digital literacies practice more deeply and eclectically.

5. Concluding Remarks

This study suggested a promising possibility for understanding multiple aspects of digital literacy practices in a global online affinity space by using three perspectives to interpret an example of discourse from the Asianfanfics website. For example, we showed how social languages are created and become privileged in a specific digital world; how autonomous motivation and relatedness drive young people to acclimate to the social language use; and how an individual's beliefs and cognitive processes regarding his or her personal knowledge and knowing affect the development of social language proficiency in a global online affinity space. In the article's multidimensional analysis through the lenses of three recently developed theoretical views, each perspective complements the others to provide explanations that transcend single viewpoints.

However, this study has several limitations. First, users' motivations and epistemic beliefs were assumed solely on the basis of the written discourses on the website. To more fully exploit this theoretical triangulation framework as a powerful analytical tool, future studies could employ interview and think-aloud methods to collect data. Doing so would provide understanding about the affective and cognitive aspects of users' digital literacy practices. Second, this study selected three specific approaches from three dimensions in which the authors specialize. We expect that different combinations of theoretical approaches—such as socio-spatial approaches, multimodal social semiotics, artifactual literacies, translanguaging, and cognitive-process theories of writing—may also be meaningful lenses for interpreting digital literacy practices. Finally, such eclectic theorizing is relatively new in the field of digital literacies. We examined only a brief case from a specific online affinity space. Therefore, we are not yet at the stage of naming the overlapping areas and defining directions among the perspectives. However, we believe that future stud-

ies that triangulate different perspectives will eventually generate new theories with new names and help us achieve a more sophisticated understanding of digital literacy practices.

Acknowledgments

We thank anonymous reviewers for their careful reading of our manuscript and their many thoughtful comments and suggestions.

Conflict of Interests

The authors declare no conflict of interests.

References

Afflerbach, P., & Cho, B.-Y. (2009). Identifying and describing constructively responsive comprehension strategies in new and traditional forms of reading. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 69–90). New York, NY: Routledge.

Alvermann, D. E. (Ed.). (2010). *Adolescents' online literacies: Connecting classrooms, digital media, and popular culture*. New York, NY: Peter Lang.

Anderson, R. C., & Pearson, P. D. (1984). A schema-theoretic view of basic processes in reading comprehension. In P. D. Pearson (Ed.), *Handbook of reading research* (1st ed., pp. 255–291). New York, NY: Routledge.

Baker, E. A. (2010). *The new literacies: Multiple perspectives on research and practice*. New York, NY: The Guilford Press.

Black, R. W. (2008). *Adolescents and online fan fiction*. New York, NY: Peter Lang.

Castek, J. (2008). *How do 4th and 5th grade students acquire the new literacies of online reading comprehension? Exploring the contexts that facilitate learning* (Unpublished doctoral dissertation). University of Connecticut, Storrs.

Chen, J. A., & Barger, M. M. (2016). Epistemic cognition and motivation. In J. A. Greene, W. A. Sandoval, & I. Bråten (Eds.), *Handbook of epistemic cognition* (pp. 425–438). New York, NY: Routledge.

Cho, B.-Y., Woodward, L., & Li, D. (2017). Epistemic processing when adolescents read online: A verbal protocol analysis of more and less successful online readers. *Reading Research Quarterly*, *53*(2), 197–221. https://doi.org/10.1002/rrq.190

Coiro, J. (2003). Reading comprehension on the Internet: Expanding our understanding of reading comprehension to encompass new literacies. *The Reading Teacher*, *56*(5), 458–464.

Coiro, J., & Dobler, E. (2007). Exploring the online reading comprehension strategies used by sixth-grade skilled readers to search for and locate information on the Internet. *Reading Research Quarterly*, *42*(2), 214–257. https://doi.org/10.1598/RRQ.42.2.2

Coiro, J., Knobel, M., Lankshear, C., & Leu, D. J. (2008). *Handbook of research on new literacies*. New York, NY: Routledge.

Curwood, J. S., Magnifico, A. M., & Lammers, J. C. (2013). Writing in the wild: Writers' motivation in fan-based affinity spaces. *Journal of Adolescent & Adult Literacy*, *56*(8), 677–685.

Deci, E. L., & Ryan, R. M. (2008). Self-determination theory: A macrotheory of human motivation, development, and health. *Canadian Psychology/Psychologie Canadienne*, *49*(3), 182–185. https://doi.org/10.1037/a0012801

Denzin, N. K. (1970). *The research act: A theoretical introduction to sociological methods* (1st ed.). Chicago, IL: Aldine.

Denzin, N. K. (1978). *The research act: A theoretical introduction to sociological methods* (2nd ed.). New York, NY: McGraw-Hill.

Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed-Method Research*, *6*(2), 80–88.

Flower, L., & Hayes, J. R. (1981). A cognitive process theory of writing. *College Composition and Communication*, *32*(4), 365–387. https://doi.org/10.2307/356600

Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, *26*(4), 331–362. https://doi.org/10.1002/job.322

Gee, J. P. (1990). *Social linguistics and literacies: Ideology in discourses*. New York, NY: Routledge.

Gee, J. P. (2004). *Situated language and learning: A critique of traditional schooling*. New York, NY: Routledge.

Gee, J. P. (2014). *An introduction to discourse analysis: Theory and method*. New York, NY: Routledge.

Gee, J. P. (2015). *Social linguistics and literacies: Ideology in discourses* (5th ed.). New York, NY: Routledge.

Gee, J. P., & Hayes, E. (2010). *Women and gaming: The Sims and 21st century learning*. New York, NY: Palgrave Macmillan.

Henry, L. A. (2006). SEARCHing for an answer: The critical role of new literacies while reading on the internet. *The Reading Teacher*, *59*(7), 614–627. https://doi.org/10.1598/RT.59.7.1

Hofer, B. K. (2004). Epistemological understanding as a metacognitive process: Thinking aloud during online searching. *Educational Psychologist*, *39*(1), 43–55. https://doi.org/10.1207/s15326985ep3901_5

Hull, G. A., Stornaiuolo, A., & Sahni, U. (2010). Cultural citizenship and cosmopolitan practice: Global youth communicate online. *English Education*, *42*(4), 331–367.

Hull, G. A., Stornaiuolo, A., & Sterponi, L. (2013). Imagined readers and hospitable texts: Global youths connect online. In D. E. Alvermann, N. J. Unrau, & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (6th ed., pp. 1208–1240). Newark, DE: Inter-

national Reading Association.

Jenkins, H., Itō, M., & Boyd, D. (2015). *Participatory culture in a networked era: A conversation on youth, learning, commerce, and politics*. Cambridge and Malden, MA: Polity Press.

Jiménez, R. T. (2000). Literacy and the identity development of Latina/o students. *American Educational Research Journal*, *37*(4), 971–1000. https://doi.org/10.3102/00028312037004971

Jiménez, R. T., Smith, P. H., & Teague, B. L. (2009). Transnational and community literacies for teachers. *Journal of Adolescent & Adult Literacy*, *53*(1), 16–26. https://doi.org/10.1598/JAAL53.1.2

Kim, G. M. (2016a). Practicing multilingual identities: Online interactions in a Korean dramas forum. *International Multilingual Research Journal*, *10*(4), 254–272. https://doi.org/10.1080/19313152.2016.1192849

Kim, G. M. (2016b). Transcultural digital literacies: Cross-border connections and self-representations in an online forum. *Reading Research Quarterly*, *51*(2), 199–219. https://doi.org/10.1002/rrq.131

Kintsch, W. (1988). The role of knowledge in discourse comprehension: A construction-integration model. *Psychological Review*, *95*(2), 163–182. https://doi.org/10.1037/0033-295X.95.2.163

Kitchner, K. S. (1983). Cognition, metacognition, and epistemic cognition. *Human Development*, *26*(4), 222–232. https://doi.org/10.1159/000272885

Lam, W. S. E., & Rosario-Ramos, E. (2009). Multilingual literacies in transnational digitally mediated contexts: an exploratory study of immigrant teens in the United States. *Language and Education*, *23*(2), 171–190. https://doi.org/10.1080/09500780802152929

Lankshear, C., & Knobel, M. (2006). *New literacies: Everyday practices and classroom learning* (2nd ed.). New York, NY: Open University Press.

Lankshear, C., & Knobel, M. (2011). *New literacies: Everyday practices and classroom learning* (3rd ed.). New York, NY: Open University Press.

Lankshear, C., & Knobel, M. (2014). Englishes and digital literacy practices. In C. Leung & B. V. Street (Eds.), *The routledge companion to English language studies* (pp. 451–463). New York, NY: Routledge.

Leander, K. M., Phillips, N. C., & Taylor, K. H. (2010). The changing social spaces of learning: Mapping new mobilities. *Review of Research in Education*, *34*(1), 329–394. https://doi.org/10.3102/0091732X09358129

Lee, K. M. (2018). *New approaches to literacies studies in the digital and globalizing world: Border-Crossing Discourses in the global online affinity spaces* (Unpublished doctoral dissertation). Arizona State University, Tempe.

Lee, K. M., & Gee, J. P. (2018). Global communication within re-imagined big "D" Discourses across boundaries: Discourses in international online affinity spaces. Paper presented at the American Educational Research Association, New York, NY.

Leu, D. J., Kinzer, C. K., Coiro, J., Castek, J., & Henry, L. A. (2013). New literacies: A dual level theory of the changing nature of literacy, instruction, and assessment. In D. E. Alvermann, N. J. Unrau, & R. B. Ruddell (Eds.), *Theoretical models and processes of reading* (6th ed., pp. 1150–1181). Newark, DE: International Reading Association.

Lupo, S., Jang, B. G., & McKenna, M. (2017). The relationship between reading achievement and attitudes toward print and digital texts in adolescent readers. *Literacy Research: Theory, Method, and Practice*, *66*(1), 264–278. https://doi.org/10.1177/2381336917719254

McKenna, M. C., Conradi, K., Lawrence, C., Jang, B. G., & Meyer, J. P. (2012). Reading attitudes of middle school students: Results of a U.S. Survey. *Reading Research Quarterly*, *47*(3), 283–306. https://doi.org/10.1002/rrq.021

Mills, K. A., & Comber, B. (2013). Space, place and power: The spatial turn in literacy research. In K. Hall, T. Cremin, B. Comber, & L. C. Moll (Eds.), *International handbook of research on children's literacy, learning, and culture* (pp. 412–423). Somerset, NJ: John Wiler &. Sons.

Mills, K. A., & Comber, B. (2015). Socio-spatial approaches to literacy studies: Rethinking the social constitution and politics of space. In J. Rowsell & K. Pahl (Eds.), *The routledge handbook of literacy studies* (pp. 91–103). New York, NY: Routledge.

Moje, E. B. (2004). Powerful spaces: Tracing the out-of-school literacy spaces of Latino/a youth. In K. M. Leander & M. Sheehy (Eds.), *Spatializing literacy research and practice* (pp. 15–38). New York: NY: Peter Lang.

Moje, E. B., & Lewis, C. (2007). Examining opportunities to learn literacy: The role of critical sociocultural literacy research: Reframing sociocultural research on literacy. In C. Lewis, P. Enciso, & E. B. Moje (Eds.), *Identity, agency, and power: Reframing sociocultural research on literacy* (pp. 15–48). New York, NY: Routledge.

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, *31*(2), 132–141.

Morrell, E. (2004). *Becoming critical researchers: Literacy and empowerment for urban youth*. Bern: Peter Lang. Retrieved from https://www.peterlang.com/view/title/57936

Pahl, K., & Escott, H. (2015). Materialising literacies. In J. Rowsell & K. Pahl (Eds.), *The Routledge handbook of literacy studies* (pp. 489–503). New York, NY: Routledge.

Pahl, K., & Rowsell, J. (2011). Artifactual critical literacy: A new perspective for literacy education. *Berkeley Review of Education*, *2*(2), 129–151.

Pahl, K., & Rowsell, J. (2013). Artifactual literacies. In J.

Larson & J. Marsh (Eds.), *The SAGE handbook of early childhood literacy* (2nd ed., pp. 263–278). London: Sage.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68

Sandoval, W. A., Greene, J. A., & Bråten, I. (2016). Understanding and promoting thinking about knowledge: Origins, issues, and future directions of research on epistemic cognition. *Review of Research in Education*, *40*(1), 457–496. https://doi.org/10.3102/0091732X16669319

Skerrett, A. (2015). *Teaching transnational youth: Literacy and education in a changing world*. New York, NY: Teachers College Press.

Stornaiuolo, A., Smith, A., & Phillips, N. C. (2017). Developing a transliteracies framework for a connected world. *Journal of Literacy Research*, *49*(1), 68–91. https://doi.org/10.1177/1086296X16683419

Street, B. V. (1995). *Social literacies: Critical approaches to literacy in development, ethnography and education*. New York, NY: Longman.

Tracey, D. H., & Morrow, L. M. (2017). *Lenses on reading: An introduction to theories and models* (3rd ed.). New York, NY: The Guilford Press.

Urban Dictionary. (n.d.). Bias. *Urban Dictionary*. Retrieved from https://www.urbandictionary.com/define.php?term=bias

About the Authors

Kewman M. Lee is an Assistant Professor in the Department of Reading, Foundations and Technology at Missouri State University. His research focuses on digital literacies in transnational online spaces, Border-Crossing Discourse, literacies and learning in out-of-school contexts, pop culture and literacies, the new literacies studies, multimodality, and discourse analysis. He teaches various literacies courses for undergraduate and graduate students.

Sohee Park is a K-12 educator and an independent researcher living in California, USA. She is currently working for an international comparative study on secondary writing education in the United States and South Korea. Prior to participating in the project, she received her PhD in Education from the University of Delaware. Her research interests include digital literacies, multimodal composition, and formative assessment of digital writing practices.

Bong Gee Jang is an Assistant Professor in the Department of Reading and Language Arts at Syracuse University. His main areas of research include literacy motivation, engagement in digital settings, and disciplinary/content literacy. His research has appeared in such journals as *Reading Research Quarterly*, *Educational Psychology Review*, *Literacy Research: Theory, Method, and Practice*, *Journal of Adolescent & Adult Literacy*, and *The Reading Teacher*. Bong Gee teaches courses related to disciplinary literacy and language arts for both pre-service and in-service teachers. He also teaches introductory and advanced research methods courses to graduate students.

Byeong-Young Cho is Associate Professor of Language, Literacy, and Culture at the University of Pittsburgh School of Education and Research Scientist at Pitt's Learning Research and Development Center. Cho's research focuses on new literacies and classroom practices to support student learning in the digital age. His work has appeared in leading journals such as *American Educational Research Journal*, *Reading Research Quarterly*, and *Cognition and Instruction*, to name a few.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 47–58
DOI: 10.17645/mac.v7i2.1880

Article

Expanding and Embedding Digital Literacies: Transformative Agency in Education

Andreas Lund *, Anniken Furberg and Greta Björk Gudmundsdottir

Department of Teacher Education and School Research, University of Oslo, 0317 Oslo, Norway;
E-Mails: andreas.lund@ils.uio.no (A.L.), anniken.furberg@ils.uio.no (A.F.), g.b.gudmundsdottir@ils.uio.no (G.B.G.)

* Corresponding author

Submitted: 13 December 2018 | Accepted: 1 February 2019 | Published: 11 June 2019

Abstract
Socio-political, environmental, cultural, and digital changes require literacies that will be crucial for facing complex challenges. This article contributes to a notion of digital literacies as agentic and transformative and having epistemological implications. Although studies in digital literacies have examined diverse forms of understanding and relating to digitalization, we find that few studies have adopted a principled approach to transformative enactment of digital literacies. Our analytic focus is on how agents turn to digital (and other) resources when faced with problems in order to make them manageable. We conceptualize this notion of digital literacies by drawing on the Vygotskian principle of double stimulation. To demonstrate how agentic and transformative literacies appear in technology-rich learning environments, we make use of an empirical setting in which lower secondary school students and their teacher face a conundrum in a science project. We use this case as an empirical carrier of the conceptual and analytical framework employed. The analysis shows how the teacher enacts digital literacies in the design and orchestration of student activities in technology-rich learning environments where unforeseen issues occur, and how the collaborating students enact digital literacies by drawing on resources that enable them to resolve their insufficient understanding of a problem to reach insights that are shared with their peers.

Keywords
agency; digital literacies; double stimulation; education; transformation

Issue
This article is part of the issue “Critical Perspectives on Digital Literacies: Creating a Path Forward”, edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction: The Need for a Transformative Stance

In the face of deep and wide-ranging changes—socio-political, environmental, cultural, and digital—identifying key competencies that will be crucial for facing complex challenges is now a central topic in policy-making, education, and research (Csapó & Funke, 2017). The present article expands on a conceptualization of digital literacies in an educational context. We apply an agentic perspective in order to act upon the world and not merely understand it, i.e. a transformative activist stance (Stetsenko, 2017). For example, Säljö (2010) shows how the rapidly multiplying digital information archives represent an expanding social memory that require performative competence to be put to relevant and productive use. However, this requires human competence in selecting information, juxtaposing it, and synthesizing it into situated and valid knowledge. Also, as digital resources increasingly take on cognitive functions (calculating, ordering, searching, assembling, systematizing, making decisions, etc.), cognition becomes distributed. The result is that our performative competence, i.e. not merely what we document but how we arrive at the results, conflates with our notion of learning. This development affects how we deal with fundamental epistemological issues (Kotzee, 2013). Thus, we

further argue that an agentive stance towards digitalization is especially important in education. New teaching and learning opportunities and challenges arise as digital technologies become increasingly sophisticated, powerful, pervasive, and—therefore—*transformative*. This means that merely understanding digitalization is not enough; students and teachers must exercise informed agency to make digital technologies serve our interests.

Digital technologies make it possible to expand educational repertoires and break out of the status quo. This is not technological determinism, as transformation depends on human agency. In education, this entails designing agentive tasks and assignments that require students *to take action in order to make sense and syntheses* of multiple sources and representations. This is where mind and context fuse in new ways: sophisticated algorithms and coding (not in its restricted sense), together with robotics are increasingly taught even in primary school to foster understandings of technology in light of human and organizational values (see e.g. Scaradozzi, Sorbi, Pedale, Valzano, & Vergine, 2015). Virtual worlds and augmented reality add to this development. But such artifacts require more than understanding; they require informed agency in order to put them to beneficial use, social as well as epistemic. These digital trends converge in the need for informed, agentive, and transformative literacies. Unless we enact such literacies, we risk becoming disenfranchised from many of our most important tasks in life and being reduced to passive observers of what others choose for us, whether it be big business, unethical politicians, or media outlets with their own agendas.

In the following, we pursue and build this argument for agentive digital literacies in education. As an empirical carrier of such a notion of digital literacies, we present and analyze a situation in a natural science classroom. The case aims to demonstrate how transformative agency is enacted when students encounter a complex problem and turn to diverse resources in order to resolve the problem situation. For explanatory power, we draw on cultural-historical conceptual and analytic frameworks, in particular, Vygotsky's (1978) principle of double stimulation. As this framework addresses transformation using cultural artifacts, we find it to be conducive to understanding, unpacking, and analyzing transformative agency that involves digital resources.

2. Perspectives on Digital Literacies: From Skills towards Transformative Practices

As an evolving concept, *digital literacies* is not clearly defined (Ilomäki, Paavola, Lakkala, & Kantosalo, 2016). Whereas Tømte (2013, p. 76) describes it as a "moving target" which changes in line with emerging technologies and contexts, Aesaert, Vanderlinde, Tondeur and van Braak (2013, p. 143) talk about it as a "tangled ball of concepts" lacking a unified definition. Hatlevik, Gudmundsdottir and Loi (2015) prefer using competence instead of literacies or skills, as the term includes a broader understanding of the phenomenon. Moreover, Hatlevik, Throndsen, Loi and Gudmundsdottir (2018) present several studies and how they relate to these concepts as combinations of a prefix (such as media, information, digital) and a domain part (such as competence, skills, literacy). All the same, Ilomäki et al. (2016) found in their literature review that the most commonly used term was *digital literacy*, followed by *digital competence*, *media literacy*, *multiliteracies*, and *new literacy*.

Knobel and Lankshear (2006) introduced three aspects amounting to the plural "digital literacies": *information*, which is typically connected to the creation or communication of information; *epistemic engagement* with information, such as validating or deciding the reliability of the information; and, finally, a *capacity or set of skills*. Epistemic engagement involves changes in the phenomena we study, changes in our conceptions of knowledge and knowing, changes in ourselves as "knowers," and changes in the relative significance of types of knowing; that makes this study very relevant for ours, although it does not specifically address transformative agency. De Oliveira Nascimento and Knobel (2017), in their review of sociocultural digital literacies research within preservice teacher education, find "a recognizable subset of the larger field of digital literacy and education research" (p. 84). They focused on social practices and "not a checklist of proficiencies or competencies" (p. 68), a position we endorse. The authors' focus on social practices avoids a competence oriented approach which is often found in (digital) literacies. As Poyntz (2015) also argues when critiquing this 'tools' and 'doing' approach, literacy is very much about thinking and analyzing using concepts, i.e. epistemic practices.

Across the diverse concepts, we find a development from the 1970s, when greater focus was on technological or tool-oriented definitions such as "computer" and "internet" literacy and towards a broader notion of digital literacies as enacted practice(s). Also, digital literacies and equivalent terms seem to constitute a complexity of concepts determined by regional differences, theoretical positioning, or disciplines. To summarize the research angle, we see conceptual development away from skills and tool orientation to a broader understanding of literacies, including epistemic aspects. However, there are epistemological implications in digital literacies which remain to be pursued; under what conditions we engage in epistemic work and how we come to knowledge is changing.

Policy-driven studies are important because they seek to operationalize and standardize results from research on digital literacies. Often, they apply items measuring digital literacies; for example, various large-scale studies, such as ICILS, PISA, PIAAC, PIRLS, TIMSS, and Eurydice, they include indicators on ICT proficiency in education, digital competence, and/or development of digital literacies. These studies monitor and compare extensive data sets on technology integration, access, and use in education. But as Hadziristic (2017, p. 13) argues in her

overview of the development: "[there] is no single measure of digital literacy, and large studies like the OECD's PIAAC are imperfect indicators of the same."

Ottestad and Gudmundsdottir (2018) write that the early phases of ICT integration and digital literacy in education often focused on tool-related skills taught within a single subject. With the advent of the Internet in the early 1990s, however, national governments began to develop policies for ICT as a tool for expanding learning (BECTA, 1998; Plomp, Anderson, Law, & Quale, 2009), i.e. a more pedagogical approach. This brought about several initiatives. Within the European Union, an emphasis on knowledge, skills, and competencies has emerged in the indicators used to measure digital literacies. Such development is evident in the DigComp competency framework (Carretero, Vuorikari, & Punie, 2017; Ferrari, 2013). From a policy perspective, we can also notice an interesting shift in the *Digital Education Action Plan* (European Commission, 2018a), a key EU policy document. The focus shifts from access to infrastructure and devices to integration in education and innovation policies, "ensuring that technologies augment and improve, rather than just replace learning in and outside the classroom and the teacher's ability to do so" (European Commission, 2018b, p. 6).

As in the research literature, we see an emphasis from technical aspects to a more process-oriented approach. There has, for example, been a great focus on the availability of digital resources in schools as an indicator in large-scale studies. This is, for example, a part of the IEA studies SITES Module 1 (Pelgrum & Anderson, 1999), SITES 2006 (Law, Pelgrum, & Plomp, 2008), and ICILS 2013 (Fraillon, Ainley, Schulz, Friedman, & Gebhardt, 2014), and can also be seen in the OECD PISA studies from 2006 onwards (OECD, 2006, 2010, 2014, 2016). The studies thus mirror investment and integration of ICT in schools, but they reflect less pedagogical aspects, curriculum integration, and what digital literacy entails for today's teacher and learner.

In the discussions on digital literacy, we also find critical voices. Partly, criticism has been leveled against the notion of young people as 'digital natives' that are inevitably socialized into multitasking and against educational designs that assume the presence of such capacity. For example, Kirschner and De Bruyckere (2017) argue that such capacities do not exist and that an uncritical perspective on digital literacy is detrimental to education. Another common criticism disapproves of digital literacies for being a too romantic or a simplistic panacea for enacting authentic, interactive, and collaborative learning (Burton, Summers, Lawrence, Noble, & Gibbings, 2015). Similarly, Rachael Shapiro (2015) offers a comprehensive analysis of the rhetoric of digital literacies and a critique of "digital literacies and their technologies…portrayed as inherently democratic for individuals and nations and are promised to deliver economic competitiveness to those who can attain and best leverage them" (p. i).

These three critical voices serve to demonstrate that the term digital literacies is employed across several levels and domains and that they converge in their efforts to instill some realism in an often romantic or even euphoric rhetoric. We share this concern but emphasize that our mission in this article is not to promote digital literacies as a magic potion. The aim of the present article is to conceptualize and operationalize digital literacies by emphasizing a transformative and agentic stance in order to take on problem situations and where digital sources must be considered for breaking out of such situations.

Summing up, both key research and policy-driven studies on digital literacy show a development from skills and technological orientation to a wider literacy/competence orientation, attitudes, knowledge, and transformation. However, the use of the concept itself remains uncertain and ambiguous, and only to a limited extent highlighting the *transformative and agentic* aspect of students and teachers.

Based on current trends in digitalization and influential literature on digital literacies, we address the following research question:

- How are digital literacies conceptualized and enacted as an agentive transformative practice in a technology-rich educational setting?

3. An Agentive and Transformative Conceptual Framework

A conceptual framework and theoretical perspective provide a language and—consequently—insights that travel beyond the immediate and the local experience. Thus, a relevant theoretical perspective will have explanatory power beyond single instances of a phenomenon. We draw on Vygotskian perspectives and, in particular, transformative agency (Sannino & Engeström, 2017; Stetsenko, 2017; Vygotsky, 1978) examined through Vygotsky's principles of double stimulation (see the section on methodology). These perspectives and analytical constructs address learning as transformation involving reciprocity between the individual and the collective, agents, and context, using cultural tools (linguistic, symbolic, material) as mediating artifacts for transformative purposes.

Recently, we have seen a rapidly accumulating body of studies on agency and transformative agency (see e.g. Emirbayer & Miche, 1998; Etelepälto, Vähäsantanen, Hökkä, & Paloniemi, 2013; Mäkitalo, 2016; Virkkunen, 2006, for essential contributions). These studies share a focus on agency as a multifarious endeavor, on a scale from resistance to committed change-making. In their seminal article on agency, Emirbayer and Miche (1998) posit that "something must be done—some practical judgment arrived at—that will render the given situation unproblematic, settled, and resolved" (p. 998). This position is further refined by Virkkunen (2006) in his asser-

tion that "agency here means breaking away from the given frame of action and taking the initiative to transform it" (p. 49). The same applies to Mäkitalo (2016) when she identifies agency as "the capacity of humans to distance themselves from their *immediate* surroundings and…to intervene in, and transform the meaning of, situated activities" (p. 64, emphasis in the original). In these citations, agency and transformation are linked. Also, transformative agency is identified when agents experience a problem situation, show initiative to break away, and utilize available resources which may alleviate or resolve the problem situation. Such contextual resources increasingly emerge as sophisticated, complex, powerful, omnipresent, and pervasive digital resources.

But this takes us further into epistemologies of digital literacies. Our focus is on knowing *how* more than knowing *what*, but we acknowledge that the two cannot really be separated. Epistemic practices are closely intertwined with the educational discipline in question, which is also shown in our empirical case. When Maton (2013) sets out to enable "knowledge processes to be seen, their organizing principles to be conceptualized, and their effects to be explored" (p. 3), he aims to suspend what is frequently perceived as a dichotomy between *knowing* and *knowledge*, between subjectively constructed and absolute or universal knowledge. As our purpose is to demonstrate the value of transformative agency as an essential dimension of digital literacies, we place ourselves in a position where our concern is how we come to knowledge, mediated by resources that themselves have been instilled with certain epistemological intentions or even prescriptions. Wikis, for example, do not make much sense in a strictly individual perspective as it builds on a premise of shared authorship and everyone's privilege to add, delete and revise the text under construction. As we search for structures or underlying principles for a particular epistemic practice we reject relativism without endorsing absolutism; (new) knowledge exercises influence on the knower (see also Maton, 2007). In the present study, the implication is that we do not explicitly focus on learning effects or measurable outcomes of the epistemic work we analyze, although these could be pursued in further studies. Rather, we focus on how the students and their teacher enact epistemic work when facing a demanding learning task which requires extensive use of various artifacts.

When we link these brief reflections on epistemological positions to digital literacies, some questions become essential: Where is agency located? Is it exclusively a human quality, or is it distributed between humans and non-humans? If so, to what extent? The answer is not given in light of recent development in, e.g., robotics, augmented reality, and healthcare chips. Our position is that *agency is not an innate disposition in the individual; it is developed in artifact-mediated and object-oriented interaction*. While we need to be aware of different approaches to the relationship between human and non-human agents, our position is that agency is distributed across agents and artifacts, although the former is ontologically prioritized.

Extended cognition is perhaps the more conventional way of thinking about digitalization: how pocket calculators, spell checkers, smartphones, and a plethora of sophisticated artifacts have increasingly taken on more cognitive load and serve to engage with humans in distributed cognition (Hutchins, 1995). One challenge for schooling is that such artifacts blur or disguise at least part of students' cognitive work. Thus, extended and distributed cognition shifts the focus from merely presenting answers and solutions to epistemic practices that reveal *how* students arrive at certain solutions and answers among several possible alternatives (Säljö, 2010). In the case we present, students need to scientifically and conceptually understand a complex phenomenon, "trait heritability". Their epistemic work involves the agentive use of digital resources which carry epistemic work instilled in these resources by others. Thus, extended cognition materializing in digital resources mediates the students' epistemic journey from confusion to understanding.

Digital technologies also play a vital role when we design new educational spaces and workplaces, both physical and virtual. Digitalization becomes increasingly embedded in educational and scientific practices to the extent that it is ubiquitous but invisible. The consequence is that we as social agents also become increasingly embedded in practices, situations, and spaces permeated by digitalization. Thus, digital technologies also structure our cognition (Huebner, 2013) as we aim to demonstrate in this case when the students make use of digital resources. Also, the teacher in the case enacts digital literacies, not as mere technological skills, but by designing learning environments and trajectories where digital resources (collaborative, representational, etc.) are potentially conducive to students' knowledge advancement. So, a second principle of digital epistemology is its embeddedness; we as cognizant beings are embedded in knowledge instilled environments and knowledge instilled artifacts are increasingly embedded in our every day and epistemic activities.

An intriguing discussion on digitalization becoming embodied has also emerged (e.g. L. Shapiro, 2007). This will obviously have implications for a broader notion of digital literacies and epistemologies, although it does not sufficiently pertain to the present argument or case to pursue this highly complex and often controversial topic. However, we acknowledge that digital technologies "inhabit" our horizon of possibilities for action. This is highly relevant for agentic and transformative literacies.

In sum, we argue that we increasingly come to knowledge by engaging in extended, embedded, (and embodied) cognition. We further argue that such perspectives contribute to understanding as well as operationalizing an agentive and transformative stance towards digital literacies in a world where digital complexity is rapidly increasing and calls for informed human response and action. However, this argument is based on epistemically

justified assumptions, i.e. epistemic humility (Matthews, 2006) and not a claim for epistemic accuracy.

We have sought to establish a conceptual framework that connects agentic, transformative literacies to epistemological implications of digitalization. Next, we turn to methodology in order to establish an analytical framework to be used in a case where we study students' and a teacher's interactions as they encounter a problem while studying genetics.

4. Methodology: Interaction Analysis and Double Stimulation

This case was selected since it makes important principles visible without being "atypical." Also, the case demonstrates that digital literacies come situated and with subject-specific features. Consequently, we argue that, although not statistically generalizable, the case serves as an empirical carrier of the reasoned judgment and operational logic for an agentive and transformative digital literacy that constitutes analytical generalization, i.e., "the extent to which findings from one study can be used as a guide to what might occur in another situation" (Kvale, 1996, p. 233). Thus, theorizing digital literacies in light of transformative agency does not emerge inductively but, on the other hand, neither is the case merely an illustration.

The data in the present case study was produced during a science project about genetics, which took place in 11 school lessons (each 60-minutes) over the course of four weeks. The participants were one class of 38 lower secondary school students, aged 15–16 years, and their science teacher. The data material consists of three hours of transcribed video recordings of one student group's interaction during a group activity where the students inquired into the topic of "trait heritability." During the project, laptops, tablets, interactive whiteboard, and smartphones were used by students and teachers. Frequently used digital resources involved Viten.no (a web-resource developed specifically for natural science education), *Cells*, a computer program, *Forskning.no* (an online research resource), and web pages from *The Norwegian Biotechnology Advisory Board*. In addition, *Wikipedia*, the online *Comprehensive Norwegian Dictionary* and web pages for *Statistics Norway* were consulted on a regular basis. This can be seen as epistemic embeddedness referred to in Section 3. The school endorsed collaborative learning and student active learning. The teachers worked in teams of four preparing and designing lessons. The teacher in the current case had degrees in math and biology and had 11 years of teaching experience. The learning activities in the project alternated between lectures, individual and group work on tasks, and the summarizing and consolidation of knowledge. In the first lesson, the students' prior knowledge was mobilized. This, together with the fact that the teacher exercised considerable disciplinary and pedagogic expertise and presence, rendered this particular inquiry-based teaching and learning activity immune from the sometimes scathing criticism of 'minimal guidance' models (see e.g. Kirschner, Sweller, & Clark, 2006).

Video data enables us to examine the details of the students' interactions in group work settings as they take place *in situ*. We draw on interaction analysis to explore collaborative learning activities in technology-rich settings and show how the teacher dealt with challenges experienced by the students. The analysis of interactions during the selected episodes is the basis from which we demonstrate our conceptualization of transformative agency. We analyze two interaction sequences taking place during the group activity: one excerpt from a group setting where the students were working on their own, searching for relevant Web-based information, and one excerpt from the same setting also involving the teacher. Interaction analysis implies that talk and interaction between interlocutors as well as between interlocutors and artifacts are analyzed sequentially (Furberg, 2016; Jordan & Henderson, 1995). Each utterance and action in a selected sequence is understood and seen in relation to the previous utterance and/or action in unfolding interactions. Analytical descriptions are oriented toward interactional achievements and not what might be taking place in individuals' minds (Linell, 2009).

To capture transformative agency in interactions, we make use of a set of analytical concepts adopted from Vygotsky's (1978) principle of "double stimulation" (the use of the term "stimulus" should not be understood in behaviorist terms). The essence can be summarized as follows: Stimulus 1 (S1) refers to a problem situation where agents encounter alternatives, double binds, impasses, conflicting motives, etc. However, unless the situation is alleviated or resolved, the agent is stuck, and the situation deteriorates further. Finding the unknown and decision making under uncertainty are examples. For instance, Silseth (2013) showed how senior high school students working with the computer game *Global Conflicts: Palestine* enacted agency for potential problem solving in a situation with incomplete and unreliable information.

To transform or break out of S1, agents must exercise transformative agency. This is where a series of second stimuli (S2) become relevant. Second stimuli may be social (e.g. peers, teachers), discursive (e.g. concepts, metaphors), symbolic (diverse representations), or material (e.g. laptops, software). The material S2 resources that agents invoke to break out of problem situations are increasingly digitalized and require diverse types of human agency. This is where the epistemological aspects of digital literacies emerge, but not necessarily immediately perceived aspects. Efforts to transform S1 may be successful or not, but either way, the invoked resources will feedback to the problem situation and alter its premises. In this process, the agent is also changed as s/he gains insights about S1 (Sannino & Engeström, 2017; Lund & Vestøl, in press). These principles will be put to work in the empirical analysis of the case we present.

5. Enacting Digital Literacies: An Empirical Case

Teaching is a profession where enacting digital literacies involve a dual focus; teachers must design technology-rich learning environments and trajectories, and, these must be conducive to their pupils' development of digital literacies as knowledge advancement, i.e. digital literacies are immersed in epistemic work. Teachers' intended designs become appropriated and transformed in class depending on the interactional rhythm and ever-changing goals and purposes enacted there (Lund & Hauge, 2011). In the case we present, there was no intention of enacting or fostering digital literacies as a *competence per se*. Rather, the enactment of digital literacies emerged in the embedded and extended epistemic relationship between actors and artifacts, the design and staging of the project and the lessons.

In science education, there has been increasing use of digital learning resources. This includes text-based resources and visual learning resources such as simulations, models, animations, and graphs aimed at supporting students' conceptual understanding and their development of epistemic skills. An example is resources designed for supporting 'inquiry learning', which entails developing hypotheses, carrying out experiments, and collecting and processing data (van Joolingen, de Jong, & Dimitrakopoulou, 2007). Thus, we see learning environments where students need to be agentic because digital resources become extensions of the students' cognitive and epistemic work. But these resources are also embedded in students' learning situations and learning environments, while students and teachers are also embedded in a digitalized learning environment.

Several studies have shown that learning situations where the students utilize digital information resources can help support their conceptual understanding and epistemic work (Strømme & Furberg, 2015). But studies also show that students experience challenges such as determining the quality and trustworthiness of Web resources, connecting epistemic work with conceptual knowledge, and transferring acquired conceptual understandings from one setting to another (van Joolingen et al., 2007). This amounts to—in Vygotskian terms—a first stimulus (S1) or a problem situation (Vygotsky, 1978). The digital (and analog) resources referred to above represent a series of S2, i.e. material artifacts students (and teachers) can utilize to break out of S1. This requires agentive digital literacies. The teacher contributes by mobilizing students' prior knowledge, clarifying terms and concepts, helping students articulate their ideas, and introducing entire classes to exercises and relevant resources that consolidate the different stages of a scientific study (Strømme & Furberg, 2015). Thus, the teacher can be seen as a 'social S2' for the students; there is direct instruction but also a responsive, enabling, and structuring approach to teaching.

In the events described below, the students and the teacher looked into the topic "trait heritability." In his preceding lecture, the teacher explained the concept "genetic dominance" and how, using a Punnett square diagram, one can calculate the likelihood of inheriting particular traits such as gender. He had prepared a PowerPoint presentation emphasizing keywords as well as a number of visualizations. Thus, we see how the teacher as a designer prepares a series of S2 for the students to help them transform a situation in which they encounter a difficult phenomenon in genetics (S1). To illustrate how to construct a Punnett square diagram to calculate trait heritability, the teacher used a diagram from a textbook showing the genetic variations of black-furred rabbits (cf. Figure 1).

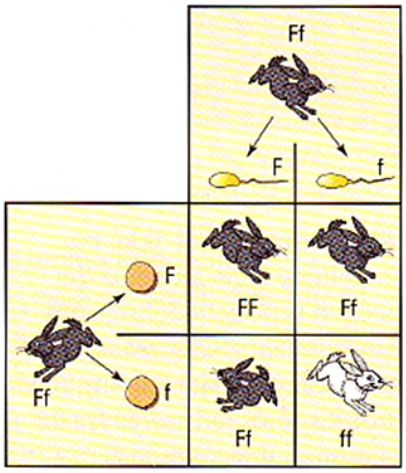


Figure 1. Punnett square diagram for two black-furred rabbits, as shown by the teacher.

After the introductory lecture, the students worked in groups to draw up a Punnett square diagram to calculate probabilities related to eye color and gender. The groups used iPads, PCs, and their smartphones, i.e. digital extensions of their cognitive and epistemic efforts, to search for relevant information regarding the Punnett square diagram. The teacher also provided them with a list of online links. Thus, we see how technologies are embedded in student work and how students are embedded in technology-rich learning environments. Below, we present two excerpts of conversations which took place right after the whole-class discussion. During the ensuing 20 minutes, the students worked in groups. Students named Gunnar, Tine, and Hans were involved in making a Punnett square diagram to calculate the probability of gender.

The students sit around a table with the textbook, a copy of two pages from another textbook, an iPad, and a cellphone that belonged to one of the students (cf. Figure 2). In addition, they have their personal notebooks. Hans finds an online statistics article that presented an overview of the number of females and males born during the last decade. The statistics showed a 51.3 percent chance of the firstborn being male. The students put aside the article for a moment to grapple with the Punnett square diagram.

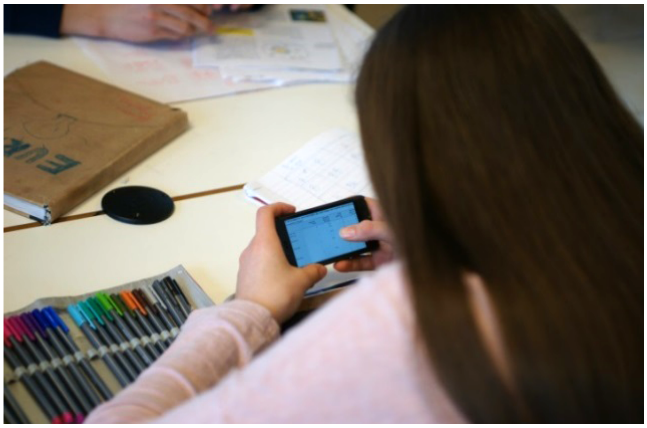



Figure 2. Pictures of the students working with the Punnett square diagram.

Excerpt 1. Dealing with divergent statistics.

Excerpt 1

1.	Gunnar:	For girls, there will always be X, 'cause they've got XX, so if you divide it in half, it will still be X. While with boys, it's XY, and so it's random which of them it will be
2.	Tine:	Okay, then we just have to draw it up, huh
3.	Gunnar:	You don't need more than X on one side, and XY for boys. And then, right away, it's X and X and X Y. 50%
4.	Tine:	50/50. Girl is X and boys are XY (.) But uhm, then I don't get why there isn't a bigger chance for it to be a girl (.) XX and XX XY and XY (2)
5.	Gunnar:	There's a caption above some tables, see
6.	Hans:	Yeah
7.	Gunnar:	It's difficult to say, but it's (.) that means that there are a teeny bit more-- That's almost an insignificant difference. So it's almost coincidental
8.	Hans:	51. Look ((*points to the table*)) (2) Everything relies on a 51-ish chance for boy
9.	Camilla:	Norwegian Children… boy.. Is that the table=
10.	Georg:	If you scroll down... it's from Statistics Norway, isn't it?
11.	Tine:	It is. Firstborn, thirdborn. But, then there's always a bigger chance of getting a boy, isn't there?
12.	Gunnar:	Yeah, that's a bit strange(.) Maybe it's written (.) err. It has something to do with how many brothers and sisters-- It's a little difficult, I don't really understand it. What makes it not be exactly 50%?

The opening of Excerpt 1 shows that when the students discover the divergence between the statistics they found online showing a 51.3 percent chance of having a boy and the Punnet diagram where they ended up with a 50 percent chance, they decide to revisit their diagram and check whether they have got it right (lines 1–4). Tine's utterance, "I don't get why there isn't a bigger chance for it to be a girl" (line 4) indicates that she is puzzled by their discovery. Hans and Gunnar add that they also find this strange. In line 10 Georg asks, "it's from Statistics Norway, isn't it?", indicating that he wants to make sure that this is a reliable source. The students continue to discuss various reasons for the differences in childbirth probabilities until Gunnar concludes; "I don't really understand it. What makes it not be exactly 50%?" (line 12). At this point, it is clear that the students do not know how to resolve the discrepancy.

The interaction among the students shows what happened when the students encountered information that went beyond the examples presented by both the teacher and the textbook, both of which stated there being a 50/50 probability of giving birth to a male or female child. The confusion articulated by the students amounted to a typical instance of a problem situation—an S1—where contradictory explanations appeared to place the students at an impasse. Without mobilizing (a series) of potentially emancipating resources (S2) the students would remain stuck and might give up. Hans's introduction of the online statistics (turn 8) emerged as such a potential S2. Epistemologically, the episode dis-

played in Excerpt 1 also serves to show how digitalization serves as extended and distributed cognition; the online data they found was appropriated by students in their epistemic efforts. The way out of the problem situation was not found solely through the use of their minds.

In Excerpt 2 we enter the setting in which the students have summoned the teacher in order to ask him about the article they have found.

Tine shows the teacher the article and the statistics they have found (line 1), and Hans explains that according to the table there is a slightly bigger chance of giving birth to "a boy" (line 2). The teacher looks at the table, and consent to the students' discovery. Then he adds: "Why is that?" (line 7). Tine, followed by Hans, suggest that the Punnett is a simplification (lines 8 and 10) of a more complex phenomenon. The teacher confirms this. Then he encourages the students to find information that could help explain *why* there is a greater chance of giving birth to males. Motivated by the teacher's encouragement, the students decide to follow up on their discovery, and begin their search for information that could shed light on this issue. Searching the internet, they discover a web article that puts forward a hypothesis stating that the higher frequency of male births may be due to disparities in the swimming speed of the spermatozoa. In the ensuing whole-class discussion, the teacher asks the students to share their findings with the rest of the class.

This agentive and transformative approach is linked to the use of diverse resources, resulting in the students gradually breaking out of the initial S1. The Punnett diagram proved to be an inadequate S2 having insufficient explanatory power whereas the online article proved to be a new and more advanced S2. Also, the teacher's subtle assistance shows how he orchestrated the unfolding inquiry by pointing to peers and resources. His question in turn 11 and his final words in the excerpt, "something isn't quite right here," spurred the students to move on with their inquiry and triggered their agentive stance. The teacher did not interrupt a learning opportunity by providing a direct answer to Tine (turn 16). It was left to the students to further transform their epistemic status by searching for, appropriating, and using relevant online information in order to break out of a situation that threatened to stifle them.

6. Discussion: Students and Teacher with Transformative Agency

Initially, we asked *How are digital literacies conceptualized and enacted as an agentive transformative practice in a technology-rich educational setting?* In the following, we systematize our interpretations in two sections: the first involving the students and the second involving the teacher. This is not because digital literacies appear

Excerpt 2. Dealing with simplification and complexity.

Excerpt 2		
1	Teacher:	How's it going with the tasks?
2	Tine:	In this ((*points to the the Statistics Norway table showing the gender specific yearly birth rates*))
3	Hans:	According to this table, there's a slightly bigger chance of giving birth to a boy every time
4	Tine:	So, the chance of it being a boy increases every time?
5	Teacher:	The probability of having a boy=
6	Hans:	That's 51-ish. Always
7	Teacher:	((*Looks at the table*)) It doesn't change. The probability of having a boy (.) it's always bigger (2) ((*glances at the students*)). Why is that?
8	Tine:	It is very simplified ((*points at the Punnett square diagram*))
9	Teacher:	Yes, it is simplified
10	Hans:	It's very simplified
11	Teacher:	There is something which modifies it a little bit, or, changes it to a certain extent. Yes, we were supposed to--. Are you capable of finding out something about it, what the cause is?
12	Tine:	We can try
13	Teacher:	Many of you are wondering about this. Many of you have heard it. But many of you have heard that more girls survive, at least. But, there it said boys, didn't it?
14	Hans:	It did
15	Teacher:	51% were boy births, wasn't it?
16	Tine:	Yes, but girls live longer. But, that can be caused by other things, can't it?
17	Teacher:	Yes, it can have something to do with those things. Something isn't quite right here ((*The teacher stands up and moves on to the next group*))

as fundamentally different from the two types of agents, but because they are situated and engaged in different practices: learning and teaching.

6.1. Transformative Agency as a Vital Dimension of Students' Digital Literacies

As for the students, we emphasize four aspects of digital literacies in the case. First, activating digital resources has no value in itself; it must be connected to a problem situation. For the students, understanding a complex phenomenon in genetics proved to be such a problem situation (S1). An early indication of agency is when students start considering resources, given or actively sought, analog or digital, in order to break out of or transform S1. This is a recognition that something must be done, in this case involving digital literacies as one of several potentially relevant social practices. We see a concerted effort in the sense that the students gradually explored diverse resources: analog, digital, social, and conceptual.

Secondly, students find themselves embedded in available resources. At this stage, digital resources become more distinct as they provide access to infinite sources of information, respond immediately, allow for copying and sharing, and suspend constraints in space and time. We have referred to this as technologies being embedded in learning environments and agents being embedded in digitalized environments. Again, this calls for an agentive stance towards digitalization: what seems relevant, what can it offer, how do I/we utilize its affordances, etc. This is where digital literacies mean connecting the problem situation and the available digital resources in order to transform the situation. In our case, we saw how students were faced with a conundrum when they realized the discrepancy in explanatory power between the analog Punnett square diagram and the digital resources.

Thirdly, some resources proved to be more conducive to epistemic transformation than others. This is a result of informed navigation and selection but also social interaction with peers and the teacher. Furthermore, this transformational aspect did not merely remain with the group at work; it was shared with the class. At this stage, the students in the group had transformed the original problem situation, S1, into a situation where they were actually able to share their newfound insight. Thus, the case demonstrates development at very close range and also reveals how digital literacies require a distinct agentic aspect in order to bring about learning.

Finally, as the case serves to open a particular situation in order to unpack its dynamics it does not yield data to claim lasting transformation of agents, learning outcomes or extended epistemic horizon beyond the local situation. However, the analysis of the students' work with a series of S2 in order to transform S1 indicates that this dynamic and dialectic approach to problem solving can connect agentive digital literacies to documented learning effects.

6.2. Transformative Agency as a Vital Dimension of the Teacher's Digital Literacies

As for the teacher, there are four aspects of the case that we wish to draw attention to and examine in light of teachers' digital literacies. One aspect concerns the *possibilities which arise in situations where students and teachers utilize multiple information sources*. The excerpts demonstrate what can occur in situations where students encounter different perspectives or conflicting explanations for the same phenomenon and how the teacher mediates navigation and orchestration of student activities in this learning environment. We have pointed to the teacher as a designer of technology-rich learning environments, but without necessarily being an expert in digital literacies, enacted as skills. This resonates with Andrews and McDougall's (2012) 'pedagogy of the inexpert'; "a handing over of power, of mastery, towards a more negotiated pedagogy" (p. 154) in situations where the plethora of resources bring about "assemblage events" (p. 158).

A second aspect concerns the way the teacher used the situation as a *point of departure to motivate the students in their search for knowledge*. The teacher did this by recognizing the relevance of the conflicting information found by the students. However, instead of giving the students the answer, he encouraged them to resolve the quandary by searching for additional information online.

A third aspect is related to *designing learning environments with various forms of knowledge representations*, e.g. online statistical information and visual representations (the Punnett square diagram). Thus, the teacher needed to adapt his planned lesson to his students' new findings. The case is an example of what several studies show: that navigating diverse forms of knowledge representations can help improve the students' grasp of the subject matter (Furberg, 2016). Also, we see that digital literacies are seldom enacted as a separate practice but are intertwined with the use of multiple analog, conceptual, symbolic, and social resources.

Historically, the textbook and the teacher's explanations were considered as authoritative information sources. However, the bringing in of information from other sources can weaken this authority. The teacher dared to let go of his authority and encourage the students to advance their understanding by finding additional relevant information online. The case also shows that digital literacies involve the need for knowledge about subject representations and the ability to facilitate the use of an exploratory method that draws on digital resources. Finally, the case shows that digital literacies are also about being able to deal with unpredictable, complex, and explorative teaching and learning situations. We have argued that this connects with an epistemology where we come to knowledge through extended and embedded (and, increasingly, embodied) cognition. As digital resources suspend constraints in time and space, link

hands and minds to infinite information, and suspend the gap between mind and context, digital literacies have become interwoven with digital epistemologies.

7. Conclusion

In this article, we have argued for a notion of digital literacies as taking an agentive and transformative stance towards digitalization, not in order to replace other notions of digital literacy but to emphasize a dimension which we argue is a contribution to the field. We have applied the dynamic relationship between problem situations (S1) and diverse potential resources (S2), such that S2 can be activated in order for agents to transform and break out of the original S1. This is essential for an understanding of digital literacies as a social and epistemic practice that is intertwined with other forms of literacy and which requires an agentic and transformative approach. By applying the Vygotskian (1978) principle of double stimulation, we revealed how students and a teacher exercised transformative agency when faced with a problem situation and transformed it into a learning experience, very much by enacting agentive digital literacies. The rationale for this approach is found partly in the extremely rapid and dramatic development of digital technologies and partly in highly relevant socio-political scenarios we have only hinted at, and particularly in the epistemological implications we identify. We have limited ourselves to an educational context, since this connects our conceptual arguments to the analysis of an empirical case from a class.

There are implications for educational practice and research. As for practice, we find that an agentive and transformative approach to digital literacies has consequences for task design in education. Tasks that can be fulfilled by providing a "correct" answer do not match the socio-political and technological development we have briefly outlined. Students need to address open-ended tasks and fuzzy problems which lend themselves to collaborative inquiry, both afforded and mediated by increasingly sophisticated digital resources. However, this requires the kind of agentive literacies demonstrated by the students in our empirical case. As for the teacher, s/he becomes a designer of an educational sequence and assemblage of events where such tasks and available digital resources are aligned with students' modes of work (individual, group, online, etc.) and—in turn—new assessment criteria and practices.

As for educational research, we argue that there is considerable untapped potential in applying and refining the Vygotskian (1978) principle of double stimulation. In the case presented here, we have confined our study to unpacking a situation in order to reveal an underlying principle of transformative agency. This principle emerges as a dynamic and dialectic unit of analysis (Lund & Vestøl, in press) and makes it possible to analyze transformation or instigate transformative interventions on a scientific basis. Also, future studies should be longitudinal and expand the focus to more clearly identify learning outcomes from transforming the problem situation (S1). We realize that such endeavors—whether in practice or research—may appear daunting, but no more so than understanding what learning in a digitalized society involves.

Acknowledgments

The empirical case is based on data from the Ark&App project funded by the Norwegian Directorate for Education and Training, and the Department of Teacher Education and School Research, University of Oslo.

Conflict of Interests

The authors declare no conflict of interests.

References

Aesaert, K., Vanderlinde, R., Tondeur, J., & van Braak, J. (2013). The content of educational technology curricula: A cross-curricular state of the art. *Educational Technology Research and Development*, *61*(1), 131–151.

Andrews, B., & McDougall, J. (2012). Curation pedagogy for media studies: (Further) towards the inexpert. *Medijske Studije/Media Studies*, *3*(6), 152–166.

BECTA. (1998). *How learning is changing: Information and communications technology across Europe. ICT in education policy*. Coventry: BECTA.

Burton, L. J., Summers, J., Lawrence, J., Noble, K., & Gibbings, P. (2015). Digital literacy in higher education: The rhetoric and the reality. In M. K. Harmes, H. Huijser & P. A. Danaher (Eds.), *Myths in education, learning and teaching* (pp. 151–172). London: Palgrave Macmillan.

Carretero, S., Vuorikari, R., & Punie, Y. (2017). *DigComp 2.1: The digital competence framework for citizens with eight proficiency levels and examples of use* (No. JRC106281). Seville: JRC. https://doi.org/10.2760/38842

Csapó, B., & Funke, J. (2017). *The development and assessment of problem solving in 21st-century schools*. Paris: OECD Publishing.

de Oliveira Nascimento, A. K., & Knobel, M. (2017). What's to be learned? A review of sociocultural digital literacies research within pre-service teacher education. *Nordic Journal of Digital Literacy*, *12*(3), 67–88. https://doi.org/10.1826/ISSN.1891-943X-2017-03-03

Emirbayer, M., & Miche, A. (1998). What is agency? *American Journal of Sociology*, *103*(4), 962–1023.

Etelepälto, A., Vähäsantanen, K., Hökkä, P., & Paloniemi, S. (2013). What is agency? Conceptualizing professional agency at work. *Educational Research Review*, *10*, 45–65. http://dx.doi.org/10.1016/j.edurev.2013.05.001

European Commission. (2018a). Digital education ac-

tion plan. *European Commission*. Retrieved from https://ec.europa.eu/education/digital-education-action-plan-action-10-artificial-intelligence-and-analytics_en

European Commission. (2018b). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions* (COM(2018) 22 final). Brussels: European Commission. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0012&from=EN

Ferrari, A. (2013). *DIGCOMP: A framework for developing and understanding digital competence in Europe*. Luxembourg: Publication Office of the European Union.

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Gebhardt, E. (2014). *Preparing for life in a digital age. The IEA international computer and information literacy study. International report*. Cham: Springer.

Furberg, A. (2016). Teacher support in computer-supported lab work: Bridging the gap between lab experiments and students' conceptual understanding. *International Journal of Computer-Supported Collaborative Learning*, *11*, 89–113.

Hadziristic, T. (2017). *The state of digital literacy: A literature review*. Toronto: Ryerson University, Brookfield Institute for Innovation and Entrepreneurship.

Hatlevik, O. E., Gudmundsdottir, G. B., & Loi, M. (2015). Digital diversity among upper secondary students: A multilevel analysis of the relationship between cultural capital, self-efficacy, strategic use of information and digital competence. *Computers & Education*, *81*, 345–353.

Hatlevik, O. E., Throndsen, I., Loi, M., & Gudmundsdottir, G. B. (2018). Students' ICT self-efficacy and computer and information literacy: Determinants and relationships. *Computers & Education*, *118*, 107–119. https://doi.org/10.1016/j.compedu.2017.11.011

Huebner, B. (2013). Socially embedded cognition. *Cognitive Systems Research*, *25/26*, 13–18.

Hutchins, E. (1995). *Cognition in the wild*. Cambridge, MA: MIT Press.

Ilomäki, L., Paavola, S., Lakkala, M., & Kantosalo, A. (2016). Digital competence: An emergent boundary concept for policy and educational research. *Education and Information Technologies*, *21*(3), 655–679.

Jordan, B., & Henderson, A. (1995). Interaction analysis: Foundations and practice. *Journal of the Learning Sciences*, *4*(1), 39–103.

Kirschner, P., & De Bruyckere, P. (2017). The myths of the digital native and the multitasker. *Teaching and Teacher Education*, *67*, 135–142. http://dx.doi.org/10.1016/j.tate.2017.06.001

Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, *41*(2), 75–86.

Knobel, M., & Lankshear, C. (2006). Digital literacy and digital literacies: Policy, pedagogy and research considerations for education. *Nordic Journal of Digital Literacy*, *1*(1), 12–24.

Kotzee, B. (2013). Introduction: Education, social epistemology and virtue epistemology. *Journal of Philosophy of Education*, *47*(2), 157–167.

Kvale, S. (1996). *InterViews*. Thousand Oaks, CA: SAGE.

Law, N., Pelgrum, W., & Plomp, T. (Eds.). (2008). *Pedagogy and ICT use in schools around the world: Findings from the IEA SITES 2006 study. CERC studies in comparative education*. Dordrecht: Springer.

Linell, P. (2009). *Rethinking language, mind, and world dialogically: Interactional and contextual theories of human sense-making*. Charlotte, NC: Information Age Publishing.

Lund, A., & Hauge, T. E. (2011). Designs for teaching and learning in technology rich learning environments. *Nordic Journal of Digital Literacy*, *6*(4), 258–271.

Lund, A., & Vestøl, J. M. (in press). Analytical units of transformative agency: Emergency and emergence. *Learning, Culture and Social Interaction*.

Mäkitalo, Å. (2016). On the notion of agency in studies of interaction and learning. *Learning, Culture and Social Interaction*, *10*, 64–67. http://dx.doi.org/10.1016/j.lcsi.2016.07003

Maton, K. (2007). Knowledge-knower structures in intellectual and educational fields. In F. Christie & J. R. Martin (Eds.), Language, Knowledge and pedagogy. *Functional Linguistic and Sociological Perspectives*. London and New York, NY: Continuum.

Maton, K. (2013). *Knowledge and knowers. Towards a realist sociology of education*. London: Routledge.

Matthews, D. (2006). Epistemic humility. In J. P. van Gigch (Ed.), *Wisdom, knowledge, and management*. New York, NY: Springer.

OECD. (2006). *Are students ready for a technology-rich world? What PISA studies tell us*. Paris: OECD Publishing.

OECD. (2010). *PISA 2009 results: What students know and can do (Vol. I): Student performance in reading, mathematics and science*. Paris: OECD Publishing.

OECD. (2014). *PISA 2012 results: What students know and can do (Vol. I): Student performance in mathematics, reading and science*. Paris: OECD Publishing.

OECD. (2016). *PISA 2015 results (Vol. II): Policies and practices for successful schools*. Paris: OECD Publishing.

Ottestad, G., & Gudmundsdottir, G. B. (2018). ICT policy in primary and secondary education in Europe. In J. Voogt, G. Knezek, R. Christensen, & K.-W. Lai (Eds.), *Handbook of information technology in primary and secondary education*. Cham: Springer.

Pelgrum, W. J., & Anderson, R. E. (1999). *ICT and the emerging paradigm for life-long learning*. Amsterdam: IEA.

Plomp, T., Anderson, R. E., Law, N., & Quale, A. (Eds.). (2009). *Cross national information and communication technology, policies and practices in education*. Charlotte: Information Age Publishing.

Poyntz, S. (2015). Conceptual futures: Thinking and the role of key concept models in media literacy education. *Media Education Research Journal*, *6*(2), 63–79.

Sannino, A., & Engeström, Y. (2017). Relational agency, double stimulation, and the object of activity: An intervention study in a primary school. In A. Edwards (Ed.), *Working relationally in and across practices: A cultural-historical approach to collaboration* (pp. 43–57). New York, NY: Cambridge University Press.

Scaradozzi, D., Sorbi, L., Pedale, A., Valzano, M., & Vergine, C. (2015). Teaching robotics at the primary school: An innovative approach. *Procedia—Social and Behavioral Sciences*, *174*, 3838–3846. https://doi.org/10.1016/j.sbspro.2015.01.1122

Shapiro, L. (2007). The embodied cognition research programme. *Philosophy Compass*, *2*(2), 338–346. https://doi.org/10.1111/j.1747-9991.2007.00064.x

Shapiro, R. (2015). *Geopolitics of digital literacies: Accounting for myths and realities* (PhD dissertation). Syracuse University, Syracuse.

Silseth, K. (2013). *Constructing learning dialogically; learners, context, and resources. Exploring how students and teachers participate igame-based learning and digital storytelling in educational settings* (PhD dissertation), University of Oslo, Oslo.

Stetsenko, A. (2017). *The transformative mind: Expanding Vygotsky's approach to development and education*. New York, NY: Cambridge University Press.

Strømme, T. A., & Furberg, A. (2015). Exploring teacher intervention in the intersection of digital resources, peer collaboration, and instructional design. *Science Education*, *99*(5), 837–862.

Säljö, R. (2010). Digital tools and challenges to institutional traditions of learning: Technologies, social memory and the performative nature of learning. *Journal of Computer Assisted Learning*, *26*(1), 53–64.

Tømte, C. E. (2013). Educating teachers for the new millennium? *Nordic Journal of Digital Literacy*, *8*(1/2), 74–88.

van Joolingen, W. R., de Jong, T., & Dimitrakopoulou, A. (2007). Issues in computer supported inquiry learning in science. *Journal of Computer Assisted Learning*, *23*, 111–119.

Virkkunen, J. (2006). Dilemmas in building shared transformative agency. *@ctivités*, *3*(1), 43–66.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

About the Authors

Andreas Lund is Professor at the Department of Teacher Education and School Research, University of Oslo. Lund's research involves teacher education, Computer-Support for Collaborative Learning, human interactions in technology-rich environments, sociocultural and activity theoretical perspectives on learning and didactics, as well as speech communities and communication change. Lund was the first Head of ProTed, Norway's first Center of Excellence in Education.

Anniken Furberg is Associate Professor at Department of Teacher Education and School Research, University of Oslo. Furberg's main academic interests relate to classroom studies focusing on students' learning processes in Computer-Supported Collaborative Learning and the role of support provided by teachers in technology-rich learning settings. This also involves an interest in teachers' professional digital competencies, and how teacher education programs can facilitate student teachers' development of professional digital competencies.

Greta Björk Gudmundsdottir is Associate Professor at the Department of Teacher Education and School Research, University of Oslo. Gudmundsdottir's work focuses on ICT in teaching and learning in schools as well as in teacher education. Gudmundsdottir's research on coherence in teacher education explores how teacher education can better integrate student teachers' theoretical knowledge of digital competence with their practical teaching experiences during practice placements.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 59–68
DOI: 10.17645/mac.v7i2.1907

Article

The Social Impact of Digital Youth Work: What Are We Looking For?

Alicja Pawluczuk *, Gemma Webster and Colin Smith and Hazel Hall

Centre for Social Informatics, Edinburgh Napier University, Edinburgh, EH10 5DT, UK; E-Mails: a.pawluczuk@napier.ac.uk (A.P.), g.webster@napier.ac.uk (G.W.), cf.smith@napier.ac.uk (C.S.), h.hall@napier.ac.uk (H.H.)

* Corresponding author

Submitted: 14 December 2018 | Accepted: 20 January 2019 | Published: 11 June 2019

Abstract
Digital youth work is an emerging field of research and practice which seeks to investigate and support youth-centred digital literacy initiatives. Whilst digital youth work projects have become prominent in Europe in recent years, it has also become increasingly difficult to examine, capture, and understand their social impact. Currently, there is limited understanding of and research on how to measure the social impact of collaborative digital literacy youth projects. This article presents empirical research which explores the ways digital youth workers perceive and evaluate the social impact of their work. Twenty semi-structured interviews were carried out in Scotland, United Kingdom, in 2017. All data were coded in NVivo 10 and analysed using thematic data analysis (Braun & Clarke, 2006). Two problems were identified in this study: (1) limited critical engagement with the social impact evaluation process of digital youth work projects and its outcomes, and (2) lack of consistent definition of the evaluation process to measure the social impact/value of digital youth work. Results of the study are examined within a wider scholarly discourse on the evaluation of youth digital participation, digital literacy, and social impact. It is argued that to progressively work towards a deeper understanding of the social value (positive and negative) of digital youth engagement and their digital literacy needs, further research and youth worker evaluation training are required. Recommendations towards these future changes in practice are also addressed.

Keywords
adolescents; digital literacy; digital youth work; evaluation; social impact

Issue
This article is part of the issue “Critical Perspectives on Digital Literacies: Creating a Path Forward”, edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

Digital technologies are no longer considered as merely supplementary educational tools. Rather, they comprise a deeply embedded element of youth work practices across Europe (Harvey, 2016). As youth workers aim to guide, empower, and support young people in their personal, social, and educational development (Sapin, 2013), digital media has been deployed to enhance communication, self-expression, and advocacy within and between youth projects (Black, Castro, & Lin, 2015). Through video, photography, and digital storytelling, participatory youth-centred initiatives have provided young people with opportunities to claim their voices and to co-create works which reflect their lived experiences (Ito et al., 2015).

In the light of fast-paced digital advancements of the 21st century, youth-centred organisations report that measuring and interpreting the social impact of digital youth has become difficult (Wilson & Grant, 2017). Whilst information on how to evaluate youth work outcomes and measure digital literacy are available, there is limited understanding of how to analyse and interpret the impact of digital youth projects (Mackrill & Ebsen, 2017).

Digital literacy is defined here as the ability to use information technology for both information sharing and information creation practices. It is concerned with how

young people access and engage with content as well as the "availability of content appropriate to the needs of users and opportunities to translate these activities into beneficial outcomes in everyday life" (Helsper, 2016). Digital literacy can be described as an evolving process, where young people access, navigate, examine, and produce digital media. Thus, the key competencies for digital literacy can be devised into three principles (Media Smarts, 2016): (1) *use* (skills such as technical know-how and the ability to use computer programs); (2) *understand* (skills related to critical thinking, contextualisation, and evaluation of digital media and its social impact); (3) *create* (skills related to digital media creation and effective online communication). In the context of this article, digital literacy youth projects are viewed as out-of-school and youth-centred projects (young people meaning under the age of 26 years old), where digital media are utilised and/or examined and/or created.

Both scholars (Livingstone, Mascheroni, & Staksrud, 2015; Mackrill & Ebsen, 2017) and youth practitioners (Harvey, 2016; Wilson & Grant, 2017) have advocated for further research into social impact evaluations of the interactions between young people and digital technologies. In an attempt to address this research gap, this article provides insights about youth workers' perceptions regarding social impact and attitudes towards social impact evaluations of digital youth work in Scotland, United Kingdom. Social impact is defined in this article as: "all social and cultural consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to another, organise to meet their needs, and generally cope as members of society" (Burdge & Vanclay, 1995, p. 59). The key questions addressed here are: (1) How do digital youth workers perceive and define the social impact of their work? and (2) What are youth workers' attitudes towards social impact evaluation of digital youth work? Data was collected through twenty interviews and the results of this study were analysed using thematic data analysis (Braun & Clarke, 2006). Based on the data and literature review analysis, it is proposed here that current (externally governed) evaluation practices (for example, outcomes-driven surveys) limit digital youth workers' abilities to critically examine and provide feedback regarding the impact of digital youth work projects.

2. Digital Youth Work: The Evolving Roles of Youth Workers

In Europe, youth work is a broad term used to describe "out-of-school" informal learning initiatives aimed at young people's personal development, social integration, or active citizenship (European Commission, 2018). A youth worker's role is to support, enable, and empower young people to take active roles in shaping their society and their futures. Youth work related activities and project objectives vary from community arts to political activism. The role of the youth worker is often crucial when establishing "voluntary relationships with young people" (Sapin, 2013, p. 3) and assisting them as they transition into adulthood. Examples of youth work practice may vary in their form and goals. Examples of youth work activities include after-school art clubs, sports groups, multi-agency health clinics, and identity-specific groups (Sapin, 2013).

In recent years, young people's transition journeys into adulthood have become influenced by the emergence of digital technologies (Mills, 2016). Young people have been surrounded with novel digital tools to learn, communicate, and express themselves creatively (Black et al., 2015). Young citizens of the digital era, also described as "digital youth" (Erstad, 2012, p. 25), need the assistance of youth workers, who are continually exploring "new ways of using digital tools and technology" (Kiviniemi & Touvimen, 2017, p. 9) with young people and for young people. Digital youth work evaluation has been identified as a key area for development by the European Commission's Digital Youth Work Experts group in 2018 (European Commission, 2018). Digital Youth Work Experts' recommendations state that:

> As digital cultures and media are an intrinsic part of young people's lives, every youth worker should understand the importance of digital youth work and youth workers be able to address digital issues in their work. (European Commission, 2018, p. 12)

Youth work environments have the potential to address young people's digital literacy needs, which are often omitted at schools or at home (Harvey, 2016). Outside-of-school digital projects also provide young people with opportunities to explore new skills, to "enrich inquiry for underrepresented groups" (Black et al., 2015) and to deploy digital technologies as tools for self-expression and empowerment (Black et al., 2015).

Digital youth work, the term mostly used in Europe (Harvey, 2016; Kiviniemi & Touvimen, 2017), is perceived as a vital part of youth engagement practices and defined as an area of youth work that implements digital technologies to enhance outcomes of youth centred initiatives (Harvey, 2017). Digital youth work's goals and ethics are the same as those proposed by traditional youth work (European Commission, 2018) and therefore should not be considered as a separate youth work method (Harvey, 2016). The central part of the practice is to focus on young people's self-development and voluntary participation (European Commission, 2018). Digital youth work might involve either offline or online engagement; digital technologies can be used as "either a tool, an activity or a content in youth work" (European Commission, 2018). Digital youth workers might be employed on a voluntary or paid basis, and may be experts from various backgrounds (for example: arts, digital technologies, or youth work). Examples of digital youth-work may include coding clubs (CoderJojo Scoltand, 2018), participatory media clubs (Sawhney, 2009), digital campaigning

and storytelling projects (Stornaiuolo & Thomas, 2017), or online chat support (LGBT Youth Scotland, 2018).

As digital literacy and creativity are emphasised as key 21st century skills (van Laar, van Deursen, van Dijk, & de Haan, 2017) new streams of funding have become available for youth work organisations to implement digital technologies in their practice (for example Hyder, 2016; Wilson & Grant, 2017). Whilst external funds enable digital literacy and digital inclusion projects' facilitation and innovative youth work solutions, it also creates a specific set of challenges. Firstly, youth workers' new and multi-layered roles of nurturing society-youth/youth-technology relationships is critical and requires "an agile mind-set, being willing to try new things and learn from both success and failure, and [need to] be supported to do so" (European Commission, 2018, p. 7). For young participants to benefit from their experience, youth workers need to create an environment which enables critical information sharing, collaboration, interest-driven learning, and self-expression (Ito et al., 2013). Secondly, the management and evaluation of digital youth work projects must be considered. Whilst there have been many successful examples of European digital youth-work projects (Harvey, 2016), there has also been evidence of scepticism, "tech-fears", and digital-literacy insecurities among those who facilitate and engage with them (Pawluczuk, Hall, Webster, & Smith, 2018). There are currently limited resources to provide youth workers with sufficient digital training (Harvey, 2016), project management, and evaluation resources (European Commission, 2018; Wilson & Grant, 2018).

3. Measuring the Social Impact of Digital Youth Work: What Are We Looking For?

Discussion of the social value of the digital technologies in young people's lives has been examined by both scholars (Livingstone & Sefton-Green, 2016; Mills, 2016) and youth work practitioners (Harvey, 2016; Wilson & Grant, 2017). The impact data have not only been collected through various disciplinary and methodological lenses (Black et al., 2015; Fawcett, Fisher, Bishop, & Magassa, 2013; Koh, 2013) but has emphasised different aspects of technology used by young people, such as communication (Buccieri & Molleson, 2015), informal learning (Erstad, 2012), information behaviour (Koh, 2013), identity development (Boyd, 2014), and online safety (Ashktorab & Vitak, 2016). Externally funded youth projects and organisations are required to collect and analyse data to prove that their work is having a positive impact to continue receive future funding. In the context of the traditional/non-digital youth work projects, youth participation (Cooper, 2018) and youth empowerment frameworks (Walker, 2007) have been proposed as effective tools to analyse the value of the projects. However, in recent years, dynamic and multi-faced digital youth-centred initiatives have become increasingly difficult to evaluate. Currently, it is unclear as to what counts as evidence of positive impact of digital youth work projects (Wilson & Grant, 2017). The uncertainty linked to the definition of impact of digital youth projects has been highlighted by youth workers in the United Kingdom:

> What is the threshold for a young person to be classed as digitally literate? What does success look like and once again is this the correct aspiration? Are digital skills an outcome in themselves or purely a means to an end, a process by which to gain other skills or qualities and ultimately, long-term improvements in well-being? (Wilson & Grant, 2017, p. 57)

To analyse and evaluate the digital skills essential in the 21st century, scholars propose theoretical frameworks examining media and information literacy (Wilson, 2012), basic digital skills (Van Deursen, Helsper, & Eynon, 2014), digital competency (Lang, Shang, & Vragov, 2009), digital literacy (Reynolds, 2016), and digital citizenship (Collier, 2016).

However, the terms *digital skills* and *digital literacy* change meaning according to learning context or geographical location. In 2017, G20 policy makers (a group of finance ministers and central bank governors from 19 of the world's largest economies and the European Union) argued that it is essential not to introduce a universal indicator to measure digital literacy, but instead implement a "standardized, multidimensional [set of measures] of digital literacy" (Chetty et al., 2018).

The uncertainty surrounding the value of digital literacy is also noted in the digital youth work context. While basic digital skills are continuously developing, it has become increasingly challenging to classify a young person as a "digital literate" (Wilson & Grant, p. 57). Basic digital skills framework is designed to primarily "capture the more tangible and objective quantitative elements of digital skills development", and thus, does not provide other elements of youth development journey. Moreover, as outcomes of media-rich informal learning environments are often "rich in contributions to social and emotional development, to identity and motivation, to developing skills of collaboration and mutual support", the analysis of their social value might require use of complementary and long-term approaches to evaluation (Lemke, Lecusay, Cole, & Michalchik, 2015, p. 5).

4. Methodology

The Qualitative data was collected from twenty semi-structured interviews and a focus group with digital youth work practitioners based in the United Kingdom and conducted in mid-2017. The purpose of the interviews and the focus group was to elicit, and gain a deeper understanding of, youth digital workers' perceptions of their practices, and to examine the social impact evaluation methods used to measure its impact. Two key questions guided the structure of the data collection: How do

youth digital workers define and measure the social impact of their work? And what are their attitudes towards social impact evaluations of digital youth work?

4.1. Study Participants

The research participants were primarily recruited through the Scottish Digital Youth Work Network. The aim of the Scottish Digital Youth Work network is to connect those practitioners who use digital tools and online spaces in their work with young people and to exchange and develop good practice models, both in Scotland and internationally (Youth Link Scotland, 2017). Information about the study was also shared online and via social media. Whilst the majority the interviews took place face-to-face, two were facilitated via Skype. Nineteen of the research subjects were based in Scotland and one worked in England. Gender distribution was 60 percent males and 40 percent females. While all the interviewees were aged 25 years and older, nearly half (9) of the participants were aged between 35 and 44. Other age groups participating in the interviews were as follows: six participants aged 25–34, four participants aged 35–44, and one in the 55–64 age bracket. In the reporting data, all participants have been anonymised. Due to the small sample size and its geographical location (Scotland, United Kingdom), caution must be applied, as findings might not be transferable to other countries.

At the time of the study, most of the participants (16) had five or more years of experience with implementing digital technologies in youth work. Among the most experienced participants were those with over 10 years of knowledge of the use of digital technologies in the youth engagement context. Only four of the practitioners interviewed had begun to implement digital technologies into their youth engagement work within the last five years. The typology of digital activities associated with interviews is illustrated in Table 1. Digital Storytelling defined here as "employment of story and digital technologies for personal expression" (Alrutz, 2015, p. 2) was a predominant theme in the interviews. Fifteen participants defined their projects as digital storytelling projects. The second most common digital youth activities among participants included Digital Arts (graphic design, animation, sound design) and Media Production (video, film production). The least declared types included two game design

Table 1. Study participant's subset data and digital youth projects categories, as coded by the authors of this article.

Name	Years of experience of using digital technologies in youth projects	Types of digital youth projects						
		Digital Arts	***Digital Storytelling***	***Media Production***	***Social Media***	***Coding***	***Game Design***	***Digital Literacy***
Alex	5–10	✓						
Alison	0–5		✓	✓				
Andy	0–5		✓		✓			
Blake	10+	✓	✓		✓	✓	✓	
Carla	5–10				✓			
Chris	5–10	✓				✓		
Debbie	10+	✓	✓		✓	✓	✓	✓
Gabriel	10+	✓		✓		✓		
Jamie	5–10		✓					✓
Jo	10+		✓	✓				
Janek	5–10		✓	✓				
Karel	5–10	✓	✓					
Kyle	0–5		✓	✓				
Martin	5–10	✓						
Marta	10+							✓
Max	10+		✓	✓				
Rowan	5–10		✓	✓				
Ryan	0–5		✓			✓		
Sam	5–10		✓	✓				
Sandy	5–10		✓		✓			

projects and three digital literacy projects. Digital youth workers' roles varied from direct digital learning delivery (the use of digital video, animation or sound design in youth-centred contexts) to overseeing digital literacy projects delivery (where young people's understanding of digital media is explored).

5. Data Analysis

5.1. Narrative 1: Emphasising the Positive Social Impacts of Digital Youth Work

Digital youth workers were invited to share their perceptions and definitions of the social impact of digital youth work initiatives. An on-going narrative focused on empowerment, engagement, and learning emerged from all twenty conversations. Whilst discussing the importance of their work, many of the digital youth workers repeatedly referred to so-called "soft skills"—such as confidence and a sense of pride—as indicators of project success. Alex noted that, "confidence is one that we quite often associate with the arts, and [becoming] confident to express yourself". Digital youth projects were also described as enhancing social skills and facilitating relationship-building. Chris stated that:

> I'll only see people for a few hours, and what's been really lovely to see is a combination of instant relationships, that happen through the fact that they all know Minecraft, and they get chatting really quickly.

Digital youth workers believed that these technological developments have had a mainly positive impact on social inclusion, youth work related power dynamics, and participation amongst young people. Sam indicated that digital technologies provide opportunities for equal dialogue and enhanced collaboration with young participants: "Digital lets us change the way we work with young people, but also changes the amount of influence...young people have over us".

Despite this agreement that social impact is primarily positive, some argued that there is a problematic tendency in the field to focus solely on positive results during the evaluation process. Fifteen out of twenty digital youth workers believed that social impact evaluation is mainly concerned with "giving the funders what they want" (Carla). Thus, if "funders want to see the positive outcome" (Chris), it is a common practice to overemphasise, or even fabricate, a project's positive impact evidence. Gabriel added that, "If you build your evaluation around improved self-worth then there's at least an unconscious impulse to not record when a young person is disappearing down a hole."

To successfully apply, receive, and justify funding, youth work organisations in the United Kingdom are required to either propose a set of project outcomes or adopt existing ones from a funding body. This is often viewed as a technocratic and overly controlling approach to social impact analysis and was repeatedly referred to as a source of frustration:

> You apply for some funding and that funding has certain things you have to achieve in it so you then tailor your project to meet those needs. You hope that it's about meeting the individual needs and being flexible to the young people that you end up working with but ultimately you have to then match the goals that you've said you would reach which is always a little bit frustrating. (Chris)

This problematic relationship with the project funders with regards to social impact evaluation was consistently highlighted across all interviews.

5.2. Narrative 2: The Digital Element of Youth Work

The results also provided evidence that the definition of the term "digital" varies significantly in the digital youth sector. As the use of technology is an expectation in youth work, some youth projects tick "the digital box" without providing young people with a meaningful experience. For example, Carla indicated that:

> A lot of youth projects just maybe provide an X-box or a computer and let the young people loose on it. They wouldn't really be doing any dedicated work to develop the young peoples' skills on it, but they sort of feel they've ticked a digital box because they've just got an X-box sitting in the corner.

Carla additionally suggested that often digital technologies are solely used for communication between workers and young people, and therefore might not be adding "anything innovative and exciting" to projects. Whilst funding for digital youth participation has become more common in the United Kingdom, many projects are thought to add "digital elements" that aren't value-added to their applications. Rowan, for example, described the "the digital bit" as a poorly defined element among digital youth workers. He complained that the digital element is often treated as "a marginalised lump rather than this thing that kind of goes in between everything we do." Further, he discussed the lack of context for many of the digital youth initiatives: "I just got that impression that [youth organisations] bought kit—they got *some kit*—and they'll give you some random training."

5.3. Narrative 3: Social Impact of Digital Youth Work Can Be Seen, But It Is Hard to Evidence

Digital youth workers described social impact evaluation as a form of transformation, which they personally witness. Alison claimed that, in her work, it is about "being able to see it [social impact] as opposed to evaluate it". These notions of feeling, or sensing, social impact during youth digital projects were highlighted by most of the

participants. Due to the dynamic nature of this transformation, it was indicated that the formal process of impact assessment—where data is collected and shared—is an ineffective means of evaluation. Social impact evaluation was also perceived as "boring", or the final—and least exciting—part of youth projects. Study participants complained about the use of traditional project feedback surveys, "because kids don't want to fill out forms, [and] workers don't want to fill out forms with kids. So, you know, you think 'who are we really doing this for?'"

The results of this study indicate that social impact assessment is a time-consuming process, and for it to be facilitated effectively, more time needs to be allocated to assessment, both during the project as well as after its completion. Rowan stated that, "If you are a tutor on your own and you are meant to be just teaching digital media or performance, or whatever, you're like oh that's half of your workshop gone, you know". The time pressures in addition to the under-staffed nature of the evaluation process were further discussed by Chris:

> I'm Project Co-ordinator as well as running the workshops and I'm doing the evaluation. The people who commissioned me to do it are basically saying well you're going to be there anyway so you might as well do all those things. I'm like yes, but I can't lead a workshop and take millions of photographs and spend twenty minutes signing people in and logging all their information, and the data that you need and capturing their feedback and actually getting some valuable delivery out of it.

Finally, fifteen out of twenty youth workers asserted that social impact evaluation should be primarily perceived as a learning process. It was agreed that the purpose of social impact assessment is to know if they provided a worthwhile experience for the participants, and to learn whether—and in what ways—their current digital youth practice could improve. However, it was also believed that due to the funders' expectations and tight deadlines, the evaluation process is frequently underused, at least in the context of organisational or youth learning. Blake complained that, "I filled in a smiley face to a frowny face it normally goes somewhere and it gets correlated and I don't ever hear back about it." Too often, organisations are forced to deliver "cookie cutter kind of programmes and make everyone fit into them" (Alison). Blake indicated that funders are too detached from youth projects to be able to fully comprehend the project's progress, and, consequently, its social impact. The conflict of interests between funders and workers creates problems relating to inconsistent understandings and perceptions of what matters during the evaluation, both for youth practitioners and young people. Jane admitted that, "it's not very often that an obvious benefit or gain for the young person while being part of an evaluation. And I don't think anybody's really got that cracked yet. Because I think that's probably the hardest bit of youth participation."

6. Discussion

Digital youth workers struggle to define and evaluate the digital element of their youth work practice and are under pressure to provide primarily positive evaluation results of their projects. Two distinctive themes were identified in this study: (1) limited critical engagement with the social impact evaluation process of digital youth work projects and its outcomes, and (2) lack of consistent definition of the evaluation process to measure the social of digital youth work.

6.1. Limited Critical Engagement with the Social Impact Evaluation Process of Digital Youth Work Projects and Its Outcomes

In alignment with existing research (Mackrill & Ebsen, 2017; Wilson & Grant, 2017), this study indicates that youth workers have limited opportunities to critically engage with the social impact evaluation of digital youth. Social impact evaluation is viewed as a time consuming administrative process (Bossen, Dindler, & Iversen, 2016), which primarily serves to fulfil digital youth work funding criteria. Youth workers are aware of and consider the following theoretical concepts in their work: digital literacy (Covello, 2010), basic digital skills (Mcgillivray, Jenkins, & Mamattah, 2017), and digital competency (Gutiérrez & Tyner, 2012). However, they also argue that practical implications of such theoretical concepts have limitations (Harvey, 2016; Wilson & Grant, 2017). It is thus apparent that "standard methods of digital skills measurement are not always appropriate and may not capture the varied types of [young people's] progression" (Wilson & Grant, 2018, p. 4). The results of this article also indicate that compulsory application of pre-agreed outcomes, technocratic formats, or frameworks in digital youth work evaluation might lead to fabricated evaluation results. Likewise, existing scholarly analysis on youth workers' practices in the United Kingdom shows that digital youth workers view social impact evaluation primarily as a process to sustain organisational funding. St Croix defines the above problem as "[youth work evaluation] impact regimes" where "competition between providers [of youth work] for an ever-diminishing funding pot means that everybody must be an impact enthusiast" (2018, p. 431). It can thus be suggested that the lack of critical engagement with evaluation and measuring "only what they [digital youth workers] would like to be there" (Merli, 2002, p. 115), may result in limited (if not false) interpretations and understandings of young people's digital literacy needs, aspirations, and their associated social impacts. Scholars emphasise that a lack of young people's meaningful participation or/and critical engagement in youth-centred project design and its evaluation is both unethical and disempowering (for example Checkoway & Richards-Schuster, 2005; Cooper, 2018; Gawler, 2005). Cooper states that an evaluation makes little sense unless it is understood as part of a learning

process" (2018, p. 102). Gawler argues that "if the information gathering will not directly benefit the children and adolescent involved or their community the evaluation process should not proceed" (2005, p. 3).

6.2. Lack of Consistent Definition of the Evaluation Process to Measure the Social of Digital Youth Work

The results of this study correlate with previous ones which assert that examining the social value of the latest digital developments has become increasingly difficult, both for researchers (Mackrill & Ebsen, 2017) and youth workers (Kiviniemi & Tuominen, 2017). It is evident that traditional youth work, defined as a fast-changing practice of "continuous analysis, choice, judgment decision making" (Batsleer & Davies, 2010, p. 5), has become more complex due to the expansions and impressiveness of the digital age. Subsequently, workers struggle to define and articulate the possible social impacts of the digital side of their youth projects (Wilson & Grant, 2017).

The lack of a consistent definition of the evaluation process for measuring the social of digital youth work presented here was also documented by Wilson and Grant:

> What is the threshold for a young person to be classed as *digitally literate*? What does *success* look like and once again is this the correct aspiration? Are digital skills an outcome in themselves or purely a means to an end, a process by which to gain other skills or qualities and ultimately, long-term improvements in well-being? (2017, p. 57)

Current findings support the idea of "standardized, multidimensional [set of measures] of digital literacy" (Chetty et al., 2018) to improve the analysis of digital literacy projects. However, it is also evident that the interactive, multi-layered, and unpredictable nature of digital youth projects often leave project facilitators unable to decide which youth developmental contexts of their work should be evaluated (Lemke et al., 2015).

7. Recommendations

To address the digital literacy needs of the 21st century, it is essential to gain a critical and holistic understanding of young people's digital literacy needs. Digital youth work environments offer young people environments where both their personal development and digital literacy can be explored. The outcomes of digital youth work projects could provide youth workers, researchers, and policy makers with important findings about young people's digital needs and aspirations. However, youth workers need to be provided with appropriate support, training, and tools for social impact evaluation of digital youth work (Harvey, 2016).

At present, more research is needed to understand both the social impact of digital youth work and its assessment. To analyse the vast range of social impacts that can occur during digital youth work projects, researchers should look beyond their disciplines to facilitate cross-disciplinary solutions and analysis of the multimodal human experience of digital projects participation. Although creative and participatory tools are currently available to measure youth development (Flores, 2007), social impact (McCabe & Horsley, 2008), and digital skills (Mcgillivray et al., 2017), there is a need for further research linking these to problematic areas in order to provide digital youth practitioners with guidance and a set of practical assessment tools. Examples of digital tools and applications (such as the use of video recordings documentation and digital games performance-based assessment) have already been tested in an informal education setting (Lemke et al., 2015); thus an up-to-date comparative analysis of such studies and their effectiveness would be beneficial for further research in this area.

To improve the quality of social impact and its evaluation of digital youth work, a review of currently used methods should be carried out. An analysis of digital youth work funder's evaluation criteria in relation to the previously documented phenomena of "target culture" in youth work in the United Kingdom (Cooper, 2018, p. 42) could also provide useful insights. Furthermore, a study of the existing power dynamics between digital youth workers, and their impact on the validity of the evaluation outcomes, could result in vital contributions to both research and digital youth work practice applications.

The importance of youth participation in the design and social impact evaluation should not be underestimated in the context of digital literacy youth projects. Participatory youth-centred approaches to digital literacy projects design and its assessment may not only provide reliable evaluation data, but may reveal unique insights about young people's digital literacy needs and aspirations (Pawluczuk et al., 2018).

The analysis presented in this article suggests that digital youth workers should be provided with a degree of flexibility and freedom when analysing the social impact of their work. Funding organisations ought to "move beyond narrowly conceived ideas of performance measurement and target setting" (Belfiore & Bennett, 2007, p. 32). As Thomas and Percy-Smith argue, youth project workers should be encouraged not merely to examine their "success and failure", nor to ask whether or not a project "got participation right", but to think reflectively about the journey and the process (Percy-Smith & Thomas, 2009, p. 32). To understand the impact of digital youth work, it is essential not to "romanticize" the emancipating qualities of the digital world (Buckingham, 2008), but to encourage social impact evaluation as a critical process, encompassing positive and negative outcomes and associated challenges.

Finally, it is vital to note that the roles of digital youth workers have yet been largely unexamined by scholarly literature. More research is required to understand

this emerging field of research and youth work practice. As stated by Kiilakoskl, "to define who we are [as digital youth workers], what we do and why we do it has never before more critical" (2017, p. 19). Thus, research collaborations to further examine social impact evaluation of digital youth might consider examining multiple-stakeholders' perspectives, including young people, digital youth workers, funding organisations, policy makers, and researchers.

8. Conclusion

This article presents empirical research examining youth workers' perceptions and experiences of social impact evaluation of digital youth work in the United Kingdom. Through thematic analysis (Braun & Clarke, 2006) of twenty semi-structured interviews, two problems were identified: (1) limited critical engagement with the social impact evaluation process of digital youth work projects and its outcomes, and (2) lack of consistent definition of the evaluation process to measure the value of digital youth work. Results of the study were examined within a wider scholarly discourse including the evaluation of youth digital participation, digital literacy, and social impact. The evidence presented here suggests that further research and youth worker evaluation training are required to obtain a holistic understanding of understanding of the social impact (positive and negative) of digital youth engagement and young people's digital needs. The analysis presented here adds to the growing body of literature on digital youth (Black et al., 2015), digital youth evaluation (Lemke et al., 2015), and digital literacy measurement (Covello, 2010; Helsper, 2016). Finally, this study sheds light on the importance of the emerging roles of digital youth workers and may provide basis for future scholarly investigations in this area.

Acknowledgments

This research was funded by Edinburgh Napier University. We thank our research participants and the members of the Scottish Digital Youth Work Network for their support during the study.

Conflict of Interests

The authors declare no conflict of interests.

References

Alrutz, M. (2015). Digital storytelling and youth: Toward critically engaged praxis. *Youth Theatre Journal*, *29*(1), 1–14. http://doi.org/10.1080/08929092.2015.1020184

Ashktorab, Z., & Vitak, J. (2016). Designing cyberbullying mitigation and prevention solutions through participatory design with teenagers. In *Proceedings of the 2016 CHI conference on human factors in computing systems* (pp. 3895–3905). New York, NY: ACM. http://doi.org/10.1145/2858036.2858548

Batsleer, J., & Davies, B. (2010). *What is youth work? Empowering youth and community work practice*. http://doi.org/10.1093/cdj/bsr050

Belfiore, E., & Bennett, O. (2007). Rethinking the social impacts of the arts. *International Journal of Cultural Policy*, *13*(2), 135–151. http://doi.org/10.1080/10286630701342741

Black, J., Castro, J. C., & Lin, C.-C. (2015). *Youth practices in digital arts and new media: Learning in formal and informal settings*. http://doi.org/10.1057/9781137475176

Bossen, C., Dindler, C., & Iversen, O. S. (2016). Evaluation in participatory design: A literature survey. In *Proceedings of the 14th Participatory Design Conference* (pp. 151–160). New York, NY: ACM. http://doi.org/10.1145/2940299.2940303

Boyd, D. (2014). It's complicated: The social lives of networked teens. *Clinical Social Work Journal*, *43*(2), 249–250. http://doi.org/10.1007/s10615-014-0512-3

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. http://doi.org/10.1191/1478088706qp063oa

Buccieri, K., & Molleson, G. (2015). Empowering homeless youth: Building capacity through the development of mobile technology. *Journal of Community Practice*, *23*(2), 238–254. http://doi.org/10.1080/10705422.2015.1027802

Buckingham, D. (Ed.). (2008). *Youth, identity, and digital media*. Cambridge and London: The MIT Press.

Burdge, R. J., & Vanclay, F. (1995). Social impact assessment. *Environmental and Social Impact Assessment*, 31–65. https://doi.org/10.1080/07349165.1996.9725886

Checkoway, B., & Richards-Schuster, K. (2005). *Participatory evaluation with young people*. Ann Arbor, MI: University of Michigan.

Chetty, K., Liu, Q., Nozibele, G., Jaya, J., Li, W., & Chen, F. (2018). Bridging the digital divide: Measuring digital literacy Economics. *Economics*, *12*. http://dx.doi.org/10.5018/economics-ejournal.ja.2018-23

CoderJojo Scoltand. (2018). *CoderDojo Scotland*. Retrieved from http://coderdojoscotland.com/clubs

Collier, A. (2016). *The heart of digital citizenship | Anne Collier | TEDxGeneva*. Retrieved from https://www.youtube.com/watch?v=Uww2XHnijKw

Cooper, S. (2018). *Participatory evaluation in youth and community work*. Oxon: Routledge.

Covello, S. (2010). A review of digital literacy assessment instruments. Retrieved from https://www.academia.edu/7935447/A_Review_of_Digital_Literacy_Assessment_Instruments

Erstad, O. (2012). The learning lives of digital youth—Beyond the formal and informal. *Oxford Review of Education*, *38*(1), 25–43.

European Commission. (2018). *Developing digital youth*

work Policy recommendations, training needs and good practice examples. Brussels: European Commission. Retrieved from http://uni-sz.bg/truni11/wp-content/uploads/biblioteka/file/TUNI10042667.pdf

Fawcett, P., Fisher, K. E., Bishop, A. P., & Magassa, L. (2013). Using design thinking to empower ethnic minority immigrant youth in their roles as technology and information mediaries. In *CHI '13 extended abstracts on human factors in computing systems* (p. 361). http://doi.org/10.1145/2468356.2468420

Flores, K. S. (2007). *Youth participatory evaluation: Strategies for engaging young people*. San Francisco, CA: John Wiley & Sons.

Gawler, M. (2005). *Useful tools for engaging young people in participatory evaluation*. Geneva: UNICEF CEE/CIS Regional Office. Retrieved from http://betterevaluation.org/resources/overview/tools_engaging_young_people_particip_eval

Gutiérrez, A., & Tyner, K. (2012). Media education, media literacy and digital competence. *Comunicar*. http://doi.org/10.3916/C38-2012-02-03

Harvey, C. (2016). *Using ICT, digital and social media in youth work. National Youth Council of Ireland 2016*. Dublin: National Youth Council of Ireland.

Helsper, E. (2016). Inequalities in digital literacy: Definitions, measurements, explanations and policy implications. In *Survey on the useHyder*, N. (2016). *Evaluation of TTS.Digital To inspire digital creativity in young people*. Glasgow. Retrieved from https://www.creativescotland.com/resources/professional-resources/research/creative-scotland-research/evaluation-of-tts-digita

Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., . . . Watkins, S. C. (2013). *Connected learning: An agenda for research and design*. Irvine, CA: Digital Media and Learning Research Hub.

Ito, M., Soep, E., Kligler-vilenchik, N., Shresthova, S., Gamber-Thompson, L., & Zimmerman, A. (2015). Learning connected civics: Narratives, practices, infrastructures. *Curriculum Inquiry*, *45*(1), 10–29. http://doi.org/10.1080/03626784.2014.995063

Kiilakoskl, T. (2017). The pillars of digital youth work. In J. Kiviniemi & S. Tuominen (Eds.), *Digital youth work—The Finish perspective* (pp. 19–28). Helsinki: Verke. Retrieved from https://www.verke.org/wp-content/uploads/2017/11/Digital-youth-work-a-Finnish-perspective_web.pdf

Kiviniemi, J., & Tuominen, S. (Eds.). (2017). *Digital youth work—The Finish perspective*. Helsinki: Verke. Retrieved from https://www.verke.org/wp-content/uploads/2017/11/Digital-youth-work-a-Finnish-perspective_web.pdf

Koh, K. (2013). Adolescents' information-creating behavior embedded in digital Media practice using scratch. *Journal of the Association for Information Science and Technology*, *64*(9), 1826–1841.

Lang, K. R., Shang, R. D., & Vragov, R. (2009). Designing markets for co-production of digital culture goods. *Decision Support Systems*. http://doi.org/10.1016/j.dss.2009.05.010

Lemke, J., Lecusay, R., Cole, M., & Michalchik, V. (2015). *Documenting and assessing learning in informal and media-rich environments*. Cambridge, MA: MIT Press.

LGBT Youth Scotland. (2018). *LGBT Youth scotland digital support*. Retrieved from https://www.lgbtyouth.org.uk/groups-and-support/digital-support

Livingstone, S., Mascheroni, G., & Staksrud, E. (2015). Developing a framework for researching children's online risks and opportunities in Europe. *EU Kids Online*. Retrieved from https://www.eukidsonline.net

Livingstone, S., & Sefton-Green, J. (2016). *The class: Living and learning in the digital age*. New York, NY: NYU Press.

Mackrill, T., & Ebsen, F. (2017). Key misconceptions when assessing digital technology for municipal youth social work. *European Journal of Social Work*, 1–12. https://doi.org/10.1080/13691457.2017.1326878

McCabe, A., & Horsley, K. (2008). *The evaluator's cookbook: Exercises for participatory evaluation with children and young people*. London and New York: Routledge.

Mcgillivray, D., Jenkins, N., & Mamattah, S. (2017). *Rapid review of evidence for basic digital skills*. Edinburgh: Scotland's Digital Participation Charter. Retrieved from https://digitalparticipation.scot/resources/reports

Media Smarts. (2016). Digital literacy fundamentals. Retrieved from https://mediasmarts.ca/digital-media-literacy/general-information/digital-media-literacy-fundamentals/digital-literacy-fundamentals

Merli, P. (2002). Evaluating the social impact of participation in arts activities. *International Journal of Cultural Policy*, *8*(1), 107–118. http://doi.org/10.1080/10286630290032477

Mills, K. L. (2016). Possible effects of internet use on cognitive development in adolescence. *Media and Communication*, *4*(3), 4–12. http://doi.org/10.17645/mac.v4i3.516

Pawluczuk, A., Hall, H., Webster, G., & Smith, C. (2018). Youth digital participation: Measuring social impact. *Journal of Librarianship and Information Science*. http://doi.org/10.1177/0961000618769975

Percy-Smith, B., & Thomas, N. (2009). *A handbook of children and young people's participation: Perspectives from theory and practice*. London: Routledge. http://doi.org/doi:10.4324/9780203871072

Reynolds, R. (2016). Defining, designing for, and measuring "social constructivist digital literacy" development in learners: A proposed framework. *Educational Technology Research and Development*, *64*(4), 735–762. http://doi.org/10.1007/s11423-015-9423-4

Sapin, K. (2013). *Essential skills for youth work practice*. London: Sage.

Sawhney, N. (2009). Voices beyond walls. The role of dig-

ital storytelling for empowering marginalised youth in refugee camps. In *Proceedings of the 8th international conference on interaction design and children* (pp. 302–305). New YorK, NY: ACM. http://doi.org/10.1145/1551788.1551866

Stornaiuolo, A., & Thomas, E. E. (2017). Disrupting educational inequalities through youth digital activism. *Review of Research in Education*, *41*(1), 337–357.

Van Deursen, A., Helsper, E. J., & Eynon, R. (2014). *Measuring digital skills: From digital skills to tangible outcomes* (project report). London: DiSTO Publications. Retrieved from http://www.lse.ac.uk/media-

Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*. http://doi.org/10.1016/j.chb.2017.03.010

Walker, K. (2007). Youth empowerment evaluation learning voice. *American Journal of Evaluation*, *28*(3), 321–326. http://doi.org/10.1177/1098214007306377

Wilson, C. (2012). Media and information literacy: Pedagogy and possibilities. *Comunicar*. http://doi.org/10.3916/C39-2012-02-01

Wilson, G., & Grant, A. (2017). *A digital world for all? Findings from a programme of digital inclusion for vulnerable young people across the UK*. Dunfermline: Carnegie United Kingdom Trust. Retrieved from https://d1ssu070pg2v9i.cloudfront.net/pex/carnegie_uk_trust/2017/10/NotWithoutMe-2.pdf

Youth Link Scotland. (2017). *Youth Link Scotland*. Retrieved from https://www.youthlinkscotland.org

About the Authors

Alicja Pawluczuk is a PhD student and an Associate Lecturer at the School of Computing at Edinburgh Napier University. Alicja's research examines the social impact of digital youth participation in the United Kingdom. She has extensive experience of community-centred digital literacy and digital inclusion workshops design and facilitation both on the national and international level. Alicja research interests include digital youth, digital literacy, community development, and social impact.

Gemma Webster is a Lecturer in the Information Systems Subject Group. Gemma's principle research interests lie in the field of human computer interaction, health care, older adults, community and assistive technologies. She is an experienced multidisciplinary researcher who has worked in a number of different environments and areas including healthcare, nature conservation, community organisations and heritage. A key aspect of all Gemma's research is that it involves 'real-world' environments, problems and partners.

Colin Smith is Senior Lecturer at Edinburgh Napier University. Colin's research examines the relationships between new information and communication technologies (ICTs), strategic innovation and organisational change, particularly in the contexts of e-government and e-democracy.

Hazel Hall (PhD MA BA FRSE FHEA FCLIP) is Professor of Social Informatics within the School of Computing at Edinburgh Napier University. She is also Docent in Information Studies in the Faculty of Social Sciences, Business and Economics at Åbo Akademi, Finland. Hall is active world-wide in Library and Information Science research. For example, she holds (or has held) distinguished external appointments, such Chair of the Research Councils UK Digital Economy Programme Advisory Board and Papers Co-Chair of the ASIST Annual Meeting.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 69–81
DOI: 10.17645/mac.v7i2.1935

Article

Reimagining Digital Literacies from a Feminist Perspective in a Postcolonial Context

Maha Bali

Center for Learning and Teaching, The American University in Cairo, New Cairo 11835, Egypt; E-Mail: bali@aucegypt.edu

Submitted: 18 December 2018 | Accepted: 10 March 2019 | Published: 11 June 2019

Abstract
Although there are many intersecting but also conflicting definitions and understandings of digital literacy, for the most part, the majority allude to critical thinking in some form or another. This article attempts to imagine a conception of digital literacy and practice of teaching digital literacy that considers a different approach to being critical while using digital technology to consume, produce and communicate. The approach builds on the feminist work of Belenky, Clinchy, Goldberger and Tarule's (1986) *Women's Ways of Knowing*. The author will also share from her own teaching experience as a postcolonial scholar teaching Egyptian students at an American liberal arts university.

Keywords
critical thinking; digital literacies; digital platforms; empathy; fake news; feminist critical thinking

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction: Beyond Digital Literacies as Technical Skills

Despite different definitions and understandings of digital literacy, most frameworks used in the educational technology field consider it multi-dimensional, and almost all consider information literacy a critical component of it (Alexander, Adams Becker, Cummins, & Hall Giesinger, 2017); one can consider information, media and digital literacy as belonging to a family of literacies, but with different foci (Hobbs, 2010). However, the landscape of digital literacy has evolved beyond the traditional understanding of information literacy because of the proliferation of social media as a new source of dissemination of information, influencing which information we see and how, and our ability to widely share information generated by users (Alexander et al., 2017; El Rayess, Chebl, Mhanna, & Hage, 2018), information with no clear accountability to establish credibility. A key difference between critical media literacy and critical digital literacy is that, in social media, "meaning-making occurs through diverse sources connected in multiple ways or networks. This draws attention to the kind of agency and "distributed expertise" (2010, p. 21) that may be generated through these "dynamic systems" (Hartley, 2010, p. 21, as cited in Burnett & Merchant, 2011, p. 49) and therefore approaches to critical media literacy that emphasize macro power structures need to be newly imagined and nuanced in the digital literacy sphere.

Digital literacy therefore intersects with both information and media literacies, but also involves components unique to the digital, such as understanding of how social media collects data and how search algorithms work, concerns about privacy and surveillance online, and understanding and experience of how multimodal content can be created and shared. An understanding of the interplay of all of these is needed, for example, when examining the credibility of fake news.

In this article, I argue that digital literacies should not be taught as a technical skill, but should be seen as a part of cultivating critical citizenship (Hobbs, 2010; Pangrazio, 2016). As such, knowing how to assess the credibility of information, knowing how platforms collect our data, and knowing how algorithms control what we see online,

should not be taught as instrumental decontextualized skills and knowledge. We need to emphasize the ways in which misinformation, privacy violation and oppressive algorithms work together to create systems that distort our views of the world, and thus our political and civic action in the world, and we need to work towards raising consciousness of these power structures (Jenkins & Joll, 2014; Pangrazio, 2016), and nurturing agency to resist them using participatory approaches influenced by the work of Paulo Freire and John Dewey (Burnett & Merchant, 2011; Jenkins & Joll, 2014; Pangrazio, 2016). This involves building awareness of how bias towards different others, lack of awareness of context, and blindness to inequities creates an environment where digital platforms can expose us to more and more ideologically extreme content and manipulate our worldview (Noble, 2018) if we are not careful as *communities* and not just as *individuals* (Hobbs, 2010). These ends often promote injustice towards marginal groups such as immigrant populations, for example, influencing how people treat them and vote politically on issues related to them. Learners also need to know the roles they can play in exacerbating such problems when they share non-credible, partially-falsified or biased information to audiences on social media, even when taken lightly. They need to collectively develop attitudes, habits and mechanisms to resist, and therefore teaching digital literacies should include collective learning outcomes as Ito and her colleagues propose (Ito et al., 2013), recognize how social media makes "new forms of sociality possible" (Rheingold, 2012, p. 251) and approach critical digital literacy as a "social skill" (Jenkins & Joll, 2014). While much literature on critical media literacy touches upon these attitudes (to be discussed in Section 2), the majority of mainstream digital literacy literature used by educational technologists (e.g., the report comparing various models by Alexander et al., 2017) does not build on this feminist-inspired work, and the work of critical digital literacy that *does* build on critical media literacy literature does not, for the most part, focus on what is distinctly digital such as the specifics I outlined above (Pangrazio, 2016).

Rather than simply aiming to help students follow a set of steps to detect fake news, as an antagonistic, individual endeavor that builds a disposition of skepticism, we need to build students' awareness of how their own contextual knowledge and biases lead them to believe or disbelieve in the first place, an awareness of how and why information is created and shared online, and how their understanding and empathy towards the "other" can influence their disposition to believe and share negative things about those with whom they disagree, for example. Knowing how to assess the credibility of a source is useless unless the person develops a sensitivity and disposition to question what reasonably warrants questioning. And it is insufficient for individuals to do this, if collectively we do not find ways to do this together and for each other, because the influence of finding something widely shared tends to create an illusion of believability.

A larger awareness of systemic inequalities and social injustice is needed to raise consciousness about how digital platforms can reproduce these inequalities and further distort our views (Hobbs, 2010; Ito et al., 2013; Noble, 2018). And as we learn about these, we should not simply promote individualistic reactions such as "leave Facebook" but rather collective action such as gathering to advocate for government and platforms to modify the laws and policies related to data (as Europe has been doing).

I teach a course I designed a few years ago entitled "Digital identities and digital literacies in an intercultural context" at the American University in Cairo in Egypt, and the majority of my students are Egyptian (a few are cultural hybrids). As a postcolonial scholar teaching postcolonial students at a hybrid American/Egyptian institution, my approach to teaching digital literacies foregrounds reflections on identity and hybridity, a questioning of our own and others' biases while promoting empathy for "the other", and an exploration of equity issues in real life and in the digital realm, before delving into digital literacies and topics such as fake news, privacy, data and algorithms. And all of these topics are tackled in a contextual manner. When I say "postcolonial" here, I am referring to a country and individuals "that have histories of colonial oppression and anti-colonial, post-colonial and de-colonizing struggles…[one among many] regions of the world that continue to live with the consequences of colonial legacy in culture, subjectivity and knowledge" (Takayama, Heimans, Amazan, & Vegneskumar, 2016, p. 5). It is also important to recognize the context of Egypt and Egyptians after the 2011 revolution and the ensuing political conflicts, and how this influences young people's approaches to citizenship and digital citizenship, given the important role of social media in the 2011 revolution (Bali et al., 2019). The context of the American University in Cairo as a hybrid institution, and students' own educational backgrounds (which often entail some form of European education in their schooling) tends to reinforce neocolonialism and its impact on students' culture, in terms of their exposure to Western academic sources and approaches and Western (particularly Anglo and American) popular media; the digital context only reinforces this as many of the technologies are designed in the West and enhance exposure to Western content and approaches to knowledge. Postcolonialism as a field of inquiry focuses on "the aftermath of European colonialism, including issues of representation, otherness, diaspora, hybridity and voice" (Asgharzadeh, 2008, p. 338) and emphasizes the "contemporary ramifications" of colonial history on "borders, multiple identities, interdependent economies, and hybrid cultures" (p. 338). These are all realities in my life and my students' lives, and I cannot imagine approaching digital literacies without addressing these issues.

Studying and teaching digital literacy can be seen as a neutral, rational undertaking, meant to develop workplace skills, but as shown in Section 2, it is not. The im-

perialist dimension of technology in general also needs to be recognized: "Coloniality can be understood as a system that defines the organization and dissemination of epistemic, material, and aesthetic resources in ways that reproduce modernity's imperial project", which involves aspects such as seamless progress, democracy, and universalism (Andreotti, Stein, Ahenakew, & Hunt, 2015, p. 23), dimensions often associated with technology and discourses surrounding it. Therefore, teaching digital literacy in critical ways must entail questioning the modernist discourses we are exposed to on a daily basis.

I would argue that we might do well to consider more feminist approaches to criticality, that center context, creativity, intuition, empathy and a social justice orientation, and apply them to our teaching of digital literacy, particularly in the Egyptian context where this is needed for constructive critical citizenship in a country where schooling does not promote critical thinking (Bali et al., 2019) nor does it provide any introduction to information, media or digital literacy beyond some basic technological skills. The next section explains the theoretical underpinnings of my approach.

2. Alternative Conceptions of Criticality

2.1. Parallels with Alternative Understandings of Critical Thinking

Teaching critical digital literacies involves encouraging students to be critical while consuming, producing and communicating using digital technologies, and to develop judgment of which tools to use, when to use them, and to reflect on their purpose for using them, and how this influences their choices.

The ideas behind the approach to digital literacies I use is inspired by the multiple conflicting understandings of "critical thinking" (CT; Bali, 2013) and how cultured and gendered they are. Broadly speaking, "first wave" CT (Walters, 1994) draws on the dominant North American CT movement, referring to CT as reasoning, logic, skepticism and argumentation (see Facione's, 1990, *Expert Consensus*), and this is most commonly used by universities (Brodin, 2007). This approach for the most part treats CT as a technical skill. On the other hand, "second wave" CT (Walters, 1994) is inspired by Marxist and feminist perspectives and often involves social justice and critical action, and valuing things like intuition and creativity (key figures include Brookfield, 1987; Benesch, 1999, 2001; Freire 1970/1993; Barnett, 1997; Belenky, Clinchy, Goldberger, & Tarule, 1986). An important distinction between first and second CT is that first wave is often individualistic and cognitive, whereas second wave emphasizes collective and communal (Johnson & Morris, 2010) action with reflection (Barnett, Giroux). First wave CT often leads to pedagogies that promote antagonistic debate and argument, which many women and minorities and some men find uncomfortable, and thus a hindrance to learning (Belenky et al., 1986).

For most faculty members at my institution, there is a lay understanding of what "critical thinking" means, which is not often influenced by feminist theory nor critical pedagogy (unless this is common within their academic field), and therefore, if and when they attempt to infuse information or digital literacies in their courses, they are unlikely to use a feminist or critical pedagogy approach.

In what follows, I first share the theoretical influences on my own thinking about approaching the teaching of critical thinking, given my background in studying CT and education, and my work experience as a faculty developer where educational technology is one of my areas of expertise; however, I later describe literature in the critical media literacy field which intersects with many of the values I mention, but which I only learned about after teaching the course several times. I hope to highlight that different understandings of what "criticality" entails influences all areas of teaching.

2.2. Contextual Digital Literacy?

A key debate within the CT movement relates to teaching CT as a generic technical skill in a separate course versus teaching it as subject-specific and via immersion (led by McPeck, 1990). This can be applied to teaching digital literacies as well. Consider specifically the case of investigating fake news. An individual is unlikely to investigate the credibility of something unless they have sufficient knowledge about the subject matter and context to make them sufficiently skeptical.

One of the main findings of Belenky et al. (1986), is that many women in particular and some men have a natural disposition and preference towards believing and understanding what they are exposed to first (what Elbow 1994 calls the "believing game") rather than what traditional approaches to CT expect, which is a more skeptical disposition (what Elbow 1994 calls "the doubting game"). If we consistently teach CT out of context and only emphasize skepticism, many students (particularly females) may follow our steps or rules within the classroom but not develop the habit to apply them outside the classroom because of their innate resistance to it. Belenky et al. (1986) call these women "connected knowers" versus traditional CT which promotes "separate knowing". Connected knowers learn more by trying to empathize and learn about the other (person or object) before doubting them. Their path to becoming critical thinkers differs from traditional CT and as they mature, they become what Belenky et al. call "constructive knowers" who are comfortable with the complexity of the world, with ambiguity and uncertainty, and are characterized by "the opening of the mind and the heart to embrace the world" (p. 141). They are able to connect their own experience with external knowledge, merging both rationality and empathy—whereas separate knowers mostly work on divorcing their own feelings and experience from their interaction with knowledge, where

rationality completely suppresses emotion and empathy. Also among the findings of Belenky et al. is that teaching that does not show the processes of thinking of the teacher, or allow students to find their own path towards knowledge, can be intimidating for women who are at the connected knowing phase (a phase less mature than the more confident constructive knower). These women need affirmation of the value of their own experiences in constructing knowledge, versus external authorities and external rules to follow. It is also important to recognize the potential negative impact of "institutionalization of critique", where it risks young people treating critique as attitudes authority figures favor, or even correct and incorrect answers, "which are unlikely to hold any transformative power as they will weigh unfavourably against the situated meanings with which learners identify" (Burnett & Merchant, 2011, p. 45).

These approaches seem more important for me in the postcolonial context of Egypt, since students are taught early on to value Western knowledge over local, and academic knowledge over personal experience. One way to empower these students to have voice is to encourage them to build on local knowledge and personal experience as valid and important sources of learning. One can also support students in making connections between their own personal experiences and understanding broader ideologies and power structures (Pangrazio, 2016).

Interestingly, the vocabulary of connection has been used in the digital context of the "connected learning" model (see Ito et al., 2013) which "advocates for broadened access to learning that is socially embedded, interest-driven, and oriented toward educational, economic, or political opportunity" and emphasizes the pursuit of "a personal interest or passion with the support of friends and caring adults" involving "individual interest as well as social support to overcome adversity and provide recognition" (Ito et al., 2013, p. 4). Connected learning is also explicitly against instrumental and competitive approaches to learning, and instead is centered "on equity, full participation and collective contribution" (Ito et al., 2013, p. 33).

When we teach digital literacy in context, we have opportunities to highlight for students how their own background knowledge about a topic influences their intuitive response to whether a source is credible or deserves further scrutiny. Rather than teaching students how to doubt a source as a first step, we are affirming their own background knowledge about a topic, and helping them build on and explore their own intuition, in order to help them reach a conclusion. This gives students the opportunity to consider what they believe before they delve into the trickier portion of doubt, and hopes to enable them to continue doing this outside the classroom as it builds on what they would naturally do as a starting point.

Thayer-Bacon (1998) stresses the contextuality of CT, something which contradicts the CT movement's more abstract notions of CT. Thayer-Bacon (1998) uses the term "constructive thinking", building upon *Women's Ways of Knowing*, and suggests a "dialectical relationship between social beings and ideas that is dynamic, flexible, and reciprocal", while also "addressing cultural influences and political power in theories about thinking" (p. 143). Therefore, when we teach about assessing credibility of a source of news, we need to also explore with students issues of confirmation bias and how we are more likely to believe information that agrees with what we already believe, how exposure to multiple perspectives and sources of news broadens our baseline knowledge of different worldviews, and how social media platforms, algorithms and external power structures of knowledge distort what we become exposed to. Teaching in this way encourages students to assume agency to overcome the ways in which these technologies can narrow their view of the world.

2.3. A Feminist Approach to Teaching Digital Literacies

If I were to describe my approach to applying Belenky et al.'s (1986) work to the teaching of digital literacies, I would summarize it as follows:

1. Exploration and discussions of identities, empathy, bias and equity before delving into specifics of digital literacies. This enables students to self-reflect and question how their own and others' biases, feelings and knowledge influence how they approach a matter—and also to possibly understand why certain people choose to undertake particular actions. For some insight into my open curriculum, please see *Equity Unbound* website which I co-developed (http://unboundeq.creativitycourse.org). *Equity Unbound* is an equity-focused, open, connected, intercultural learning curriculum, influenced by the connected learning model which embodies "values of equity, social belonging, and participation" (Ito et al., 2013, p. 8).
2. Embrace digital literacies in a holistic manner that highlights the interplay between digital platforms, their collection of data, their algorithms, and what we know about how media can be manipulated, how news can be falsified and how false information can spread.
3. We explore context and what we already know, feel and believe about something before we investigate it. We build on existing knowledge and experience, and also bring forward awareness of our own biases and biases of others.
4. Being explicit about process in the classroom. Not every news item we investigate in class is one where I already have a conclusion. We go through the process of investigation individually then share with the group and explore nuances of "most likely true" or "false with a grain of truth" or "possibly true but biased" rather than simply real or fake. We also explore why someone might spread false

information and our roles in spreading or preventing such fake information.
5. Being explicit about an overarching goal of striving towards social justice and better understanding in the world, rather than gaining a skill to argue better or detect lies. An understanding that there may be sinister underpinnings as part of larger systems of power in the world, but that we have agency as individuals and as a society to resist.

2.4. Intersections with Feminist Approaches to Critical Media Literacy

While I developed my own approach to teaching critical digital literacy from a feminist perspective, I later discovered literature in critical media literacy that also follows feminist approaches, and a number of approaches to critical digital literacies that are not often mentioned in reports on digital literacy frameworks such as Alexander et al. (2017). Much of the seminal work came before the advent of social media (e.g., Kellner & Share, 2005; Luke, 1994; Luke, 2000, as cited in Pangrazio, 2016) but has much to offer that can be useful for digital literacy (Pangrazio, 2016).

For example, this quote from bell hooks (1996, p. 3, as cited in Kellner & Share, 2005, p. 375) when the internet was still in its infancy can be applied to digital literacy: "While audiences are clearly not passive and are able to pick and choose, it is simultaneously true that there are certain 'received' messages that are rarely mediated by the will of the audience". It is important for teaching of digital literacy to unpack how algorithms and technological platforms have a role in this despite each individual's agency as a user of technology. In Egypt's postcolonial context, it is also important to recognize how much of this messaging comes from a different culture than their own, which attempts to dominate their thinking in subtle and explicit ways.

Luke (1994) proposes that teaching of critical media literacy begin with exploration of student identities (also emphasized by Burnett & Merchant, 2011, in the more current context of social media) which is something I foreground in my course title and especially in the beginning of teaching my course. Luke also suggests the use of "open-ended and collaborative, not competitive, learning experiences" (p. 44), which is something I try to emphasize as inspired by the work of Belenky and her colleagues. She also emphasizes how feminist pedagogy should challenge hierarchy and student-teacher relationships and traditional forms of knowledge, and explore intersectionality of power and privilege, which also entails diverse content choices and teaching and assessment methods. These are things I do in my class by often not placing myself as the authoritative source of knowledge, and learning out loud with my students, as well as inviting them to contribute resources and alternative ways of addressing issues we discuss in class. This is particularly important in Egypt where questioning authority is strongly discouraged in schooling and in life in general (the January 2011 revolution notwithstanding, and, as suggested by Bali et al. (2019) not necessarily representing deep criticality). Luke also emphasizes the importance of encouraging students to not only question popular media, but also more academic sources teachers use—some of the examples I share in future sections will highlight how I attempted to do this in my teaching.

Addressing intersectionality is particularly relevant to my context because in many ways my students are privileged: they are studying at a private non-profit American institution in Egypt, arguably one of the better universities in Egypt and the region. The majority are from privileged backgrounds and have received international schooling. But in other ways they are marginalized, because of their Egyptian (versus Western) identity. Most of them are Muslim, the majority religion in their country, but one which is attacked in the Western media because of so-called Islamic terrorism. In many ways, they feel marginalized and misunderstood, even as they recognize their local privilege. Some of them are cultural hybrids due to parenting or birthplace, but almost all of them are culturally hybrid because of their Western education even if those who have lived in Egypt all their lives.

Kellner and Share (2005) emphasize the importance of integrating multicultural and social difference within media literacy studies and the ways critical media literacy as a field has been influenced by critical pedagogy and feminist theory. This intersects with my own course design that interweaves intercultural learning with digital identities and digital literacies from the get-go and is influenced by feminist pedagogy. Integrating these involves understanding and questioning the processes of knowledge construction and issues of equity and social justice in media representation and the ways they can reproduce marginalization of already marginalized groups (Kellner & Share, 2005), and these are dimensions I address directly in my classes.

There are models of critical digital literacy influenced by critical media literacy, but there is a lack of engagement with the uniquely digital aspects of digital literacy (Pangrazio, 2016), such as the fact that "fluidity and instability, multiple meanings, readings and interpretations are a feature of digital environments and notions of positionality and ideology become much harder to pin down" (Burnett & Merchant, 2011). There are two approaches to digital literacy that are often in opposition: "either critical consumption or creative production; and builds either the technical skills of design or the more general, theoretical skills of critique. Such binary opposition has fragmented critical digital literacy along theoretical lines" (Pangrazio, 2016, p. 168). Pangrazio therefore proposes an approach that merges both:

> Unpacking and understanding how ideology is made affective and personal could therefore become a powerful method of critique in the digital context. In this way the individual is the axial point; however,

> their personal experiences might be a 'portal' through which to explore the deeper ideologies that structure the reality of the digital context. (Pangrazio, 2016, p. 168)

One approach would be to teach about social media critique by accounting "for the ways in which individuals' meaning-making practices help them to perform identities within relational networks and how these networks contribute (or not) to that sense of belonging" online (Burnett & Merchant, 2011, p. 50).

Hobbs (2010) makes connections between media and digital literacies as involving social and ethical dimensions: "When people have digital and media literacy competencies, they recognize personal, corporate and political agendas and are empowered to speak out on behalf of the missing voices and omitted perspectives in our communities" (p. 17). These are goals I strive for my students to achieve in my course. In a country where social media was used to support a revolution in 2011, students need to think critically about how this happened but also be aware of the strengths and limitations of social media, and its potential for connecting with others and for being critical citizens, but also the risks of cyberbullying and corporate and state surveillance.

3. In Practice: Culturally Contextual Teaching of Critical Digital Literacies

In what follows, I share several examples of culturally contextual teaching of critical digital literacy from my own course. Throughout the course, I intentionally select content that comes from the global South whenever possible, and attempt to provide examples relevant to student lives. Students' public blogs from the course are aggregated over several semesters and can be found at http://diglit.creativitycourse.org. Quotes by students, unless otherwise specified, are from their blogs, which are listed in the reference section of this article.

3.1. Trump/Mecca Video: Teaching about How Context Influences Our Skepticism

It is important to encourage students to be aware of their own biases when they attempt to evaluate the credibility of online sources. To make them ask themselves, "what made me feel skeptical about this, and made me search to check its credibility" and "is there anything inside me that automatically biases me to believe or disbelieve something, and why" (confirmation bias). As such, it is important when teaching students to evaluate credibility that it is a spectrum, that some of the things we are evaluating are either mostly true, or have elements of truth, so students do not assume they should be equally skeptical of every single thing, or that everything is equally non-credible. Overemphasizing skepticism can result in students losing faith in the existence of any truth at all, and this is dangerous (Bali, 2018; El Rayess et al., 2018). It is also important to recognize how previous information and biases we have influence how we look at a new piece of information—and to remind students that they may already have such knowledge, and be able to bring it to new situations. These are not technical skills or steps you learn and follow, but more nuanced constructed knowledge that each student will have developed over time. Aside from teaching students' skills about detecting fake news, we need to also discuss with them questions of bias, and how confirmation bias may mean our ideologies influence what we choose to believe or disbelieve.

For example, in the first few weeks of teaching, before we ever discuss fake news, I show students a video on YouTube of Donald Trump in the White House being interviewed for an American news show. In the video, Trump points to a large picture up on the wall and calls it "a sea of love" and talks about how people have come from all over the country, maybe the world, and it's a "sea of love". The picture is one of the Kaaba in Mecca and Muslims performing the pilgrimage (Hajj). I have shown this video to adults and students in Egypt and outside Egypt. Outside of Egypt, if people do not know what the Kaaba is, or that it is a Muslim pilgrimage, they have a neutral reaction to it. They don't see any particular dissonance. However, people who know Islam and recognize what the image is, start to express surprise. Among those are two camps: one camp believes the video is real, but express skepticism over why Trump might be talking about Islam in such a positive way. Some suggest he is trying to impress Saudi Arabia, or that he does not understand what he is looking at. This perspective is based on an understanding of American politics and relations with Saudi Arabia, and on the knowledge that Trump in general does not speak positively about Islam. A few people suggest that perhaps Trump has changed his perspective, or has a balanced perspective on "good" Islam versus terrorist Islam. Others, particularly younger students, start wondering if the video is fake and immediately start searching for alternatives. Quite quickly, they realize that the picture in the video was switched from one of Trump's inauguration (that's the "Sea of love" of people traveling for his inauguration) to one of Mecca. Three important things we discuss after we do this exercise are: first of all, you can question the authority of the professor; just because the professor is showing something in class, does not necessarily mean you should believe it; and second, it is OK and acceptable to try to first imagine why something that seems so unbelievable might be true (i.e. it is not naive to assume the video might be true; it shows empathy and a willingness to understand a perspective different from what your biases expect you to see); and the third thing is to question the agenda of someone who creates such a video. I don't know who created the video or why, but we discuss whether it was meant as a joke, or to improve Trump's image among Muslims, or something else, and whether it has potential to cause damage. We also discuss the impact of sharing

such videos and memes, and what it means when they go viral, and each of our own roles in spreading material on social media when we are unsure of its credibility. Importantly, students learn that they already have some knowledge to bring to the classroom, that they are not learning about digital literacy in a vacuum, but that they can bring previous knowledge to the table and build upon it.

This resonates with Belenky et al.'s (1986) conception of the teacher as "midwife", coaching and supporting the student to bring their own knowledge to the fore, constructing new knowledge by building on what they already know and believe, rather than fostering skepticism and doubt as a priori valued attitudes. In the end, the students recognize that they are watching a falsified video. But they reach this knowledge by affirming what they already know to be true, and letting it lead them to this conclusion that the video must be fake because of other information they have which is true. Later in the course, students learn about Caulfield's (2017) "Four Moves and a Habit approach", but they are still free to explore other approaches to constructing their knowledge besides these steps. Caulfield's approach basically suggests that someone fact-checking a source should do this via a habit of checking their own emotions first when approaching this exercise, and applying these four moves: checking for previous work (that has fact-checked the source), going upstream to the source (i.e., finding the original source of the information used in the source you're looking at), reading laterally (finding out what others say about the reputation and credibility of the website, author, etc.) and circling back (i.e., start over again but using different search terms and pathways).

Blogging in hindsight about this activity, some students felt it was natural for them to be skeptical of the video immediately, because they "knew" Trump hates Muslims. But one student, Nermeen, demonstrated the *Women's Ways of Knowing* thought process:

> If I was skeptical for a second I could have definitely known that it is fake but actually it didn't even cross my mind that it is fake because I though[t] "Why would the professor show us something that is not real?" and this taught me a lesson that I should always be skeptical about the knowledge I get from anyone and anyplace and always make sure that it is REAL. (Nabil, 2018a)

Another student, Hana El-Sherbiny (2018), also talks about the authority of the professor:

> When seeing the video, I didn't think twice and that was because of the credibility of my professor, I thought that she would never show us something fake and it was also a video with trump's voice so how could it be?

Of course, students eventually learned to be skeptical of what they saw—not just as a knee-jerk reaction, but based on knowledge they already had. The same student, Hana, talks about how later in the course studying how fake news is created (via some games we played on the topic) helped her understand how fake news comes about, and that helped her skepticism.

In one class, a student recommended we watch a video about the "NASA Girl" (for English coverage of this, see Egypt Independent, 2018), an AUC student who created a viral fake news campaign claiming she would work with NASA to create a barbecue party underneath rockets as they launched. This started off originally as a joke, but people believed her and she kept getting more extreme and it became more and more viral. This was an example from our local context, and watching this girl relay her story, and discussing students' reactions to it was eye-opening. Some students who knew this girl in person said they did not believe her because they knew what kind of person she was and that she was always joking; others talked about how at first they did not believe, but as she posted more things on social media, they started to believe it. Some of us were hearing about it for the first time. In discussing this, students were building on what we knew of NASA in general, what we knew of this girl in specific (for those who knew her) and we discussed how knowledge of how someone can edit an image and make a post viral would influence how much we believed something.

3.2. Empathy and Equity First

As part of the course, students participate in intercultural web-based video dialogue via a program called Soliya Connect several times in the semester. Soliya Connect is a cross-cultural web-based video dialogue program, where a group of students from all over the world meet for two-hour sessions outside of class time but with a trained facilitator, to discuss cross-cultural issues in semi-structured dialogues (see www.soliya.net). This experience helps promote both digital literacies and intercultural learning, but can also have inherent power dynamics and inequities (Bali, 2014). But before we enter into this experience of dialoguing online with culturally different others, we learn a lot about bias, empathy and equity. We play some narrative choose-your-own-path games that are meant to nurture empathy, and students then create their own games to promote awareness and empathy for populations and causes they care about, and post them on their blogs for other students and anyone else to play and give feedback (these are often educators in my network and their students). Games have been identified as one of the pedagogical methods that can nurture critical digital literacy (Hobbs, 2010), and while a game played in a few minutes is no substitute for the lifelong pursuit of gaining empathy for others, it is a form of digital storytelling that can provide a spark for understanding different worldviews that other forms of storytelling may not achieve. For example, student voices in Bali et al. (2019) include the following:

> The Spent digital narrative made me feel really empathetic towards those living in a constant financial struggle as it highlighted extremely tough and heartbreaking decisions that these individuals would have to make. (Autoethnographic account by student Fatma, p. 164)

> The narrative games that we played and designed made me experience feelings of conflict, and I struggled to make decisions, ethical ones too, as if I were the person going through this….I think this aspect of the course, as subtle as it might have been, changed my apathetic side….I learned to use my digital skills to raise awareness through all different media about social justice whether it was through blogging, designing a game, or even ranting on social media. (Autoethnographic account by student Fayrouz, pp. 164–165)

> When we were asked to design our own digital narrative games…even though I have never experienced domestic abuse, when designing this game I really had to put myself in the shoes of those who are and have experienced domestic abuse. (Autoethnographic account by student Jana, p. 165)

> Creating our digital narrative games had the greatest impact on me…we obviously had to do some research about our topics. I chose to speak about street-sweepers in Egypt, which taught me a lot about their horrible living and working conditions, essentially making me feel extreme empathy towards them and therefore long for social justice for them and everyone I learnt about through the different narrative games found online and made by my classmates. (Autoethnographic account by student Fadila, p. 165)

We also conduct several activities to heighten awareness of inequity. By doing so before the Soliya intercultural dialogue (which take place outside class time, and students do them at different times without the instructor present but with a trained facilitator), they are better able to understand their place in the intercultural setting, how to listen well but also note inequalities related to use of language, technical infrastructure, and who holds power to control these online conversations. Students become aware of how their own hybridity (as Western-educated Egyptians) facilitates their interaction online with Americans, Europeans and other Arab students. They also sometimes see their own roles as bridges to help facilitate those conversations and move them forward. This also feeds into how they approach more digital literacy focused topics such as fake news, privacy and algorithms.

In their final reflections, many students talked about how important it was for them to learn through digital games that promoted empathy towards refugees, people with limited income, and others, and to create their own, and generally to question bias and appreciate empathy. Examples of games created by students include games to promote awareness of illiteracy in Egypt, child marriage, gender issues, drug addiction, being under the influence of alcohol, domestic abuse, and single motherhood (see links to examples of student work here: https://diglit.creativitycourse.org/class-resources/digital-narrative-games). As previously reported (Bali et al., 2019), the activity of creating these games in itself has a strong influence on students' development of empathy as they research the topics and attempt to retell the stories in a choose-your-own-path format, as well as other readings and videos promoting empathy. One particularly striking reflection came from a male student, Karim:

> I had always thought that I had some kind of weak side in myself as I always felt empathy towards people that are put in bad life situations and experiences. I have learned that empathy is a feeling that more or less everyone felt when we heard about some other person that is passing [by] atrocious events. The difference is only that some people show empathy more than others. In our society, people tend to be raised with a set idea that women have more empathy than men. In this class I have learnt that this is simply a myth. The myth of the strong wreck-less man the cute puppy hearted woman. I have learned that this was absolutely not what was actually happening. (Habashi, 2018)

3.3. Teaching about Privacy and Surveillance from Our Context

Much of the discussion on privacy of data is familiar to our students, but the real dangers of privacy and surveillance are quite different in an Egyptian context than in an American or European context. Students are aware of how corporations mine their data (some more than others), but what is truly worrying for them is the way organizations and governments surveil their data for political purposes and with potentially high political risks such as imprisonment or worse. As such, I try to focus my teaching on this topic on the work of Zeynep Tufecki, a Turkish scholar whose context is familiar to our students, and who makes connections between the 2011 Egyptian revolution in Tahrir Square and the more recent events of the election of Donald Trump (e.g., Tufecki, 2018). They therefore build a complex perspective on the social media that can be used for good, for communication, mobilization and liberation, but also for bad, for polarization, oppression and distortion.

3.4. Questioning How We Understand Credibility

Quite often, the criteria we use for assessing credibility can be imperial and colonizing. In my class, we discuss what it means to find information online, and which information is available online and in which languages and to whom it is accessible. One stark example of how the

world online looks different to different populations is to look at Wikipedia. I discuss with students how Wikipedia is not actually a poor quality source of information as a "first stop" encyclopedia, and we discuss how information is edited on Wikipedia by anyone, but that there are editors and discussions in the background that attempt to ensure a minimum level of credibility. We also sometimes edit some Wikipedia pages during the course.

The example I give is the page on the October 1973 war and how the story is told on Wikipedia. The October 1973 war is seen in Egypt as a major victory, and there is a city and a bridge in Egypt named after 6th of October, which is a national holiday. The Arabic version of Wikipedia calls this event a victory for Egypt. The English version of Wikipedia uses almost the same facts as the Arabic version, but concludes that Israel eventually won that war. If someone were able to only read in one of those languages, they would only get one version of history. Now, granted, multiple versions of history have always existed and will always exist, but it is also important to note that my students come from a variety of disciplines, e.g. engineering, in which they do not normally discuss complexity and bias of historical knowledge with students, nor does the Egyptian education system promote this criticality at any point. But it is dangerous to assume that the supposedly democratic nature of the web, including Wikipedia and Google, means that anyone searching online will have access to a balanced perspective or all the possible views on a topic; on the contrary, there are dominant views that more easily visible via Wikipedia (English). We talk about Chimamanda Ngozi Adichie's (2009) "Danger of a Single Story" and who controls which story is told about a people (particularly postcolonial people), which stories we hear about ourselves online and how they influence how we see ourselves and others. Whose knowledge is privileged in the world and online?

We also talk about how Google's and YouTube's search algorithms and recommendations build on the popularity of searches of other people, what Google learns about our own searches, and often recommend more radical sites and videos to visit, in order to keep people online. We also learn about how these algorithms reproduce bias in the real world. These algorithms that were originally conceived as "value-neutral", in practice, never are.

3.5. Limitations to This Approach in Practice

There are several limitations to this approach in practice. One of the most difficult aspects of teaching this course is that the student population comes from different majors. I have students who are studying mass communication and therefore may have some understanding of digital literacy. At the same time, I have engineering and business students who probably have no such background. I also have political science and psychology students who may have familiarity with some of the messages of this course but not others. This course also draws students from computer science, who think they have more digital skills than everyone else but are unaware of their (frequent) lack of digital literacies. This means that there is no common foundation upon which to start the course, and outcomes for different students will differ (which I am comfortable with, as they have different goals coming into the course as well).

One major limitation is that approaches to teaching that decenter teacher authority run two major risks: first, that democratic classroom dialogue may end up creating space in the classroom for more dominant voices over quieter voices; this does indeed occur sometimes in class, where a particular student (sometimes, but not always, male) takes up large amounts of time during class discussions. It can also lead to views that do not align with social justice and equity to be heard, or for students to think "anything goes" as the teacher allows different viewpoints to be presented. This may result in some students listening but not changing their minds in any significant way if their original standpoints were strongly not social justice focused. A second risk this approach poses is that students who are more used to authority of the teacher end up confused: the teacher does not tell them about one correct method to applying digital literacy, but instead models a messy process of self-exploration, and in the end, they may not know for sure what worked and what did not, and how to transfer this to other contexts. We must consider that whereas *Women's Ways of Knowing* may work better for most female and minority students, it is still unfamiliar to most people in the class and may seem uncomfortable to most males and some students who have previously succeeded academically by using more traditional approaches to thinking critically.

It is also worth noting that nurturing these approaches for students may not help them in other academic endeavors where they are expected to demonstrate skepticism and perform antagonistic debate, for example.

4. Considerations for Further Research

This article, initially intended as a thought piece, did not follow a social science research methodology, unlike previously published collaborative autoethnography about the same course (Bali et al., 2019), but rather represents the instructor's own personal account, similar to an authoethnographic approach, and uses quotes from student public blogs as supporting evidence.

One possible direction for deepening this research in the future would be to analyze student reflective writing several times in the semester using particular prompts in order to glean where they stand on Belenky et al.'s framework, or to analyze it using Baxter Magolda's (2004) framework that sees parallels and pathways between Perry's model of intellectual development and Belenky et al.'s, so that we may see to what extent different students feel more comfortable thinking about digital lit-

eracy with Perry's more masculine model or Belenky et al.'s model, and whether the course influences their approaches. This may also be achieved via class observations by an objective outsider, or via interviews as students think aloud about their approaches to digital literacy questions. This idea for future research is inspired by the paper by Fields (2001) applying Belenky et al.'s model to assessing women's epistemological development in student approaches to information literacy.

5. Conclusions

There are existing digital literacy frameworks that touch upon elements of what I mention here. The majority of models outlined and compared in Alexander et al.'s (2017) report on digital literacies do not take up critical or feminist conceptions of digital literacy in higher education. For example, Belshaw's approach includes a cultural and civic element to digital literacies, but "critical" here is not in the critical pedagogy sense; the *Teaching Tolerance Digital Literacy Framework* (2017) is one I recently discovered and includes elements of empathy and bias. Also, the well-known Information literacy framework, Association for College and Research Libraries ([ACRL], 2015), has a strong emphasis on understanding authority as constructed and contextual, and of working with process and conversation—but this framework centers mainly on information and not digital literacy per se. There are also critical feminist media literacy approaches as outlined by Luke (1994) and Kellner & Share (2005) that build feminist approaches into teaching media literacy, emphasizing critique of power structures in media and also suggesting teaching practices that challenge student-teacher power relationships; however, I feel like these models intersect with but do not directly apply to the unique aspects of the digital (Pangrazio, 2016). While the work of Ito et al. (2013), Jenkins and Joll (2014) and Rheingold (2012) is uniquely digital and emphasizes sociality and networked aspects of the digital, focuses on equity, and alludes to Freire's work, they do not delve deeply into these issues from a feminist perspective. Pangrazio's (2016) model lays out a good theoretical foundation to conceive of a critical digital literacy, but to me, does not specify how to apply this in practice. I hope that my framing of digital literacy teaching practice as drawing its criticality from feminist conceptions of criticality provides a different route to teaching digital literacy that may both better support female and minority students, and more intentionally cultivate an empathetic and engaged citizenry in the postcolonial context of Egypt, but also in similar contexts beyond.

Reviewing my approach versus literature and results of applying it in practice:

1. An exploration and discussion of identities, empathy, bias and equity before delving into specifics of digital literacies. This approach intersects with values related to equity and participation mentioned by Ito et al. (2013, p. 8) and emphasis on identities by Luke (1994) and Burnet and Merchant (2011). In practice, students come in with varying consciousness of equity and empathy, and some develop it better than others over the course. There was also one student who suggested we should speak instead about "othering" as a more systemic form of social bias, rather than bias and empathy on the more personal level. This is something I will consider in future semesters, and we showed a video this student recommended in class.
2. Embrace digital literacies in a holistic manner that highlights the interplay between digital platforms, their collection of data, their algorithms, and what we know about how media can be manipulated, how news can be falsified and how false information can spread. This takes the work of critical media literacy into the uniquely digital in the way described by Pangrazio (2016). Students often come in with an already skeptical mindset about how their privacy is violated by social media, but not necessarily practicing caution. They are often not completely surprised about how algorithms work, especially in terms of perpetuating existing power structures. The delicate balance here is between reaching a point of "social media is bad, let's disconnect completely", which many students start considering after watching TED Talks by Sherry Turkle, and a more constructive approach to becoming more critical consumers and producers of digital media, and becoming critical digital citizens (Hobbs, 2010).
3. We explore context and what we already know, feel and believe about something before we investigate it. We build on existing knowledge and experience, and also bring forward awareness of our own biases and biases of others. This has been working well for me in class, but some students have misunderstood "we are all biased" to mean "it is OK for me to be biased, and to act on it", rather than to mean "I need to recognize my biases and work towards consciously not acting on them and changing them".
4. Being explicit about process in the classroom. Not every news item we investigate in class is one where I already have a conclusion. We go through the process of investigation individually then share with the group and explore nuances of "most likely true" or "false with a grain of truth" or "possibly true but biased" rather than simple real or fake. This builds on the work of Belenky et al. (1986), and intersects with notions by others (Kellner & Share, 2005; Luke, 1994) regarding decentering teacher power in the classroom and empowering students to construct their own knowledge. We also explore why someone might spread false information and our roles in spreading or preventing such fake information. This has the dangerous

consequence of possibly giving students ideas of how to spread more fake news. This has not explicitly happened, but one student suggested a future assignment to be for students to create a fake news item and spread it on social media as a social experiment, like "NASA girl" mentioned earlier. Fortunately, other students rejected this idea as they felt it went against the values of the course, and instead, collectively, we decided to do an assignment within the classroom itself or in person with others outside the class, where someone brought one piece of real news, one of deceptive/fake news, and we all guessed which was real and which was fake. That way, the person presenting the news could immediately correct any misunderstandings before something fake went viral.

5. Being explicit about an overarching goal of striving towards social justice and better understanding in the world, rather than gaining a skill to argue better or detect lies. An understanding that there may be sinister underpinnings as part of larger systems of power in the world, but that we have agency as individuals and as a society to resist. I am unsure if I provided an assessment as evidence that students have developed this, and I hope to do so in future.

From my students' final reflections this semester, I have chosen some quotes. They were asked to blog about the three most important things they learned in the class, and what helped them learn the most.

Two students, Nermeen and Yasmine created a game in the class to encourage people not to judge others and to empathize, building on what we had been doing in the course. For Nermeen, this was her natural disposition:

> To be honest, I've always tried to give people reasons for who they are and what they do; and tried to put myself in their shoes but never actually have been through the experience of having to take decisions on their behalf and think of their situations as if they were my own situation. (Nabil, 2018b)

For Yasmine, this was something she developed during the course:

> I learnt not to be judgmental. Although this might seem strange since the course is about digital literacies, still we got to learn about understanding and tolerating different perspectives of various topics in life. (Abdelghany, 2018)

In Pansee's final reflection, she shows similar behavior to Belenky et al.'s (1986) findings about women feeling torn between believing and disbelieving, and then maturing to see the complexity and a degree of self-awareness of what makes her more likely to believe:

> I've always been very skeptical of things I read online and almost never believe them; however, I tend to slightly start believing online news when they start spreading across social media and everyone is talking about them or when the content is being said by someone in a video. (Moussa, 2018)

Hanan, a journalism student, shared how the *Fake It to Make It* game (which puts the player in the position of someone intentionally creating fake news) helped her understand how this works as a process not just as something we consume:

> I had never been put in a practical situation to deal with fake news or need to understand how the fake news business operates. The game called Fake It to Make It put this idea into perspective, showing the impact that this news has on us and the people around us. (Rashwan, 2018)

On the course's larger goal to nurture more empathetic critical citizens, Mahmoud Yehia's (2018) final reflection included this: "I have learned a lot about becoming more of a human integrated in the world society than anything else". In his blogpost, he describes how he took what he was learning in his class and talked to his family and friends about how to assess credibility of information they find on social media so that more of us are aware and fewer people share fake news.

Another student, Karim Habashi wrote:

> Going into a class and discussing the topic decided by the doctor with the other students in the class made me learn that there is a way easier way of memorizing information then writing them down and reading them back and forth. I have also learned from this class that students…always have something to add to what the doctor has to say. Most of the time the additions that students have are what we end up [remembering]. This automatically lead me to learn that one often learns more while having a dialogue than by attending a lesson and taking notes. I noticed I was learning from dialogues. (Habashi, 2018)

Student final reflections overall show that students approached the topic of digital literacies from a dimension of empathy and understanding of the other, and through a contextual, reasonable doubting, rather than through antagonistic and exaggerated skepticism. Over several semesters, in their written and oral reflections, students have said they valued the in-class discussions and felt heard by the teacher and other students. While this can happen in classes without a feminist pedagogy, it is essential that feminist pedagogy provides such an environment, but the important dimension to keep working on is to ensure that dominant voices do not take over the discussions to the extent that they silence other voices, and that students for whom discussions result in confusion

find a way to navigate these and distill their learning in order to transfer it to other contexts. At the end of such a course, one cannot know the depth of its impact on students, and if I had the opportunity to follow students a few years later, after graduation, to see how much of the course still remained with them, I would be interested to see if they changed their digital literacy practices, but also if they retained some of the values of empathy and social justice we explored in the course, especially if they majored in engineering or business where such topics are rarely, if ever, explored.

Acknowledgments

The author would like to acknowledge the influence of the following people on her thinking on this topic: Frances Bell, Kate Bowles, Catherine Cronin, Mia Zamora, Mike Caulfield, Renee Hobbs. The author would also like to express gratitude for the four peer reviewers whose constructive feedback was invaluable to her learning and helped vastly improve the quality and usefulness of this article by expanding her own knowledge and thinking.

Conflict of Interests

The author declares no conflict of interest.

References

Abdelghany, Y. (2018, December 15). Final reflection [Blog post]. Retrieved from https://yasminabdelghanyblog.wordpress.com/2018/12/15/final-reflection

Association of College and Research Libraries. (2015). *Framework for Information Literacy for Higher Education*. Retrieved from http://www.ala.org/acrl/standards/ilframework

Adichie, C. N. (2009). The danger of a single story. *TED Talk*. Retrieved from https://www.ted.com/talks/chimamanda_adichie_the_danger_of_a_single_story

Alexander, B., Adams Becker, S., Cummins, M., & Hall Giesinger, C. (2017). *Digital Literacy in Higher Education, Part II: An NMC Horizon Project Strategic Brief*. Austin, TX: The New Media Consortium.

Andreotti, V. d., Stein, S., Ahenakew, C., & Hunt, D. (2015). Mapping interpretations of decolonization in the context of higher education. *Decolonization: Indigeneity, Education & Society*, *4*(1), 21–40.

Asgharzadeh, A. (2008). The return of the subaltern: International education and politics of voice. *Journal of Studies in International Education*, *12*(4), 334–363. https://doi.org/10.1177/1028315307308137

Bali, M. (2013). *Critical thinking in context: Practice at an American liberal arts university in Egypt* (Unpublished doctoral dissertation). University of Sheffield, Sheffield, UK. Retrieved from http://etheses.whiterose.ac.uk/4646

Bali, M. (2014). Why doesn't this feel empowering? The challenges of web-based intercultural dialogue. *Teaching in Higher Education*, *19*(2), 208–215. https://doi.org/10.1080/13562517.2014.867620

Bali, M. (2018, February 24). Skepticism and trust and a class activity [Blog post]. Retrieved from https://blog.mahabali.me/educational-technology-2/skepticism-trust-and-a-class-activity

Bali, M., Awwad, A., Halawa, F., Hassib, F., Khalifa, J., & El Serogy, F. (2019). Global citizenship education in a digital age: (Re) Imagining subjects and citizens. In J. Dorio, E. Abdou, & N. Moheyddin (Eds), *The struggle for citizenship education in Egypt: (Re)Imagining subjects and citizens*. New York and Oxon: Routledge.

Barnett, R. (1997). *Higher education: A critical business*. Buckingham: Society for Research into Higher Education and Open University Press.

Baxter Magolda, M. B. (2004). Evolution of a constructivist conceptualization of epistemological reflection. *Educational Psychologist*, *39*(1), 31–42.

Belenky, M. F., Clinchy, B. M., Goldberger, N. R., & Tarule, J. M. (1986). *Women's ways of knowing: The development of self, voice, and mind* (Vol. 15). New York, NY: Basic books.

Belshaw, D. (2016). *The essential elements of digital literacies*. Retrieved from https://dougbelshaw.com/blog/2016/06/27/ebook-now-free

Benesch, S. (1999). Thinking critically, thinking dialogically. *TESOL Quarterly*, *33*(3), 573–580. https://doi.org/10.2307/3587682

Benesch, S. (2001). *Critical English for academic purposes: Theory, politics, and practice*. Mahwah, NJ: L. Erlbaum Associates.

Brodin, E. (2007). *Critical thinking in scholarship: Meanings, conditions and development* (Unpublished doctoral dissertation). Lund University, Lund, Sweden.

Brookfield, S. D. (1987). *Developing critical thinkers: Challenging adults to explore alternative ways of thinking and acting*. San Francisco, CA: Jossey-Bass.

Burnett, C., & Merchant, G. (2011). Is there a space for critical literacy in the context of social media? *English Teaching: Practice and Critique*, *10*(1), 41–57. Retrieved from http://education.waikato.ac.nz/research/files/etpc/files/2011v10n1art3.pdf

Caulfield, M. A. (2017). *Web literacy for student fact-checkers*. (n.p.): Michael A. Caulfield. Retrieved from https://webliteracy.pressbooks.com

Egypt Independent. (2018, October 25). Update: AUC student lied about NASA inviting her for 'giant BBQ'. *Egypt Independent*. Retrieved from https://ww.egyptindependent.com/egyptian-tells-nasa-to-use-a-giant-bbq-as-rocket-launch-pad-they-accept

El Rayess, M., Chebl, C., Mhanna, J., & Hage, R., (2018) Fake news judgement: The case of undergraduate students at Notre Dame University–Louaize, Lebanon. *Reference Services Review*, *46*(1), 146–149. https://doi.org/10.1108/RSR-07-2017-0027

Elbow, P. (1994). Teaching two kinds of thinking by teach-

ing writing. In K. S. Walters (Ed.), *Rethinking reason: New perspectives on critical thinking* (pp. 25–32). Albany, NY: SUNY.

El-Sherbiny, H. (2018, December 4). *Curation: Fake news* [weblog post]. Retrieved from https://hana.travel.blog/2018/12/04/curation-fake-news

Facione, P. A. (1990). *Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction—Executive summary*. The Delphi report. Milbrae, CA: The California Academic Press. Retrieved from http://www.insightassessment.com/pdf_files/DEXadobe.PDF

Fields, A. M. (2001). Women's epistemological development: Implications for undergraduate information literacy instruction. *Research Strategies*, *18*(3), 227–238. https://doi.org/10.1016/S0734-3310(02)00089-7

Freire, P. (1970/1993). *Pedagogy of the oppressed. 30th anniversary edition*. New York and London: Continuum International.

Habashi, K. (2018, December 11). Final reflection [blog post]. Retrieved from https://karimhabashi.home.blog/2018/12/11/final-reflection

Hobbs, R. (2010). *Digital and media literacy: A plan of action*. Washington, DC: The Aspen Institute. Retrieved from https://mediaeducationlab.com/sites/default/files/Hobbs%2520Digital%2520and%2520Media%2520Literacy%2520Plan%2520of%2520Action_0_0.pdf

Ito, M., Gutiérrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salen, K., . . . Watkins, C. (2013). *Connected learning: An agenda for research and design*. Irvine, CA: Digital Media and Learning Research Hub. Retrieved from https://dmlhub.net/wp-content/uploads/files/Connected_Learning_report.pdf

Jenkins, H., & Joll, (2014). How do digital media & learning (DML) and media literacy communities connect? Why is it important that these communities work together towards common goals? *Connections*. Retrieved from http://www.medialit.org/reading-room/how-do-digital-media-learning-dml-and-media-literacy-communities-connect-why-it

Johnson, L., & Morris, P. (2010). Towards a framework for critical citizenship education. *The Curriculum Journal*, *21*(1), 77–96. https://doi.org/10.1080/09585170903560444

Kellner, D., & Share, J. (2005). Toward critical media literacy: Core concepts, debates, organizations, and policy. *Discourse: Studies in the Cultural Politics of Education*, *36*(3), 369–386. https://doi.org/10.1080/01596300500200169

Moussa, P. (2018, December 15). Final reflection [Blog post]. Retrieved from https://panseemoussa.wordpress.com/2018/12/15/final-reflection

Nabil, N. (2018a). Fake news curation [Blog post]. Retrieved from https://nermeenahmednabil.wordpress.com/2018/11/25/fake-news-curation

Nabil, N. (2018b, December 15). Final reflection [Blog post]. Retrieved from https://nermeenahmednabil.wordpress.com/2018/12/15/final-reflection

Noble, S. U. (2018). *Algorithms of oppression: How search engines reinforce racism*. New York, NY: NYU Press.

Luke, C. (1994). Feminist pedagogy and critical media literacy. *Journal of Communication Inquiry*, *18*(2), 30–47.

Pangrazio, L. (2016). Reconceptualizing critical digital literacy. *Discourse: Studies in the Cultural Politics of Education*, *37*(2), 263–274. https://doi.org/10.1080/01596306.2014.942836

McPeck, J. E. (1990). *Teaching critical thinking: Dialogue and dialectic*. New York, NY: Routledge.

Rashwan, H. (2018, December 15). Final reflection [Blog post]. Retrieved from https://hananrashwan.wordpress.com/2018/12/15/final-reflection

Rheingold, H. (2012). *Net smart: How to thrive online*. Cambridge, MA: MIT Press.

Takayama, K., Heimans, S., Amazan, R., & Vegneskumar, M. (2016). Doing southern theory: Towards alternative knowledges and knowledge practices in/for education. *Postcolonial Directions in Education*, *5*(1), 1–25. Retrieved from https://www.um.edu.mt/pde/index.php/pde1/article/view/72/115

Teaching Tolerance. (2017). *Digital literacy framework*. Retrieved from https://www.tolerance.org/frameworks/digital-literacy

Thayer-Bacon, B. (1998). Transcribing and redescribing critical thinking: Constructive thinking. *Studies in Philosophy and Education*, *17*, 123–148.

Tufecki, Z. (2018, August 14). How social media took us from Tahrir Square to Donald Trump. *MIT Technology Review*. Retrieved from https://www.technologyreview.com/s/611806/how-social-media-took-us-from-tahrir-square-to-donald-trump

Walters, K. S. (1994). Introduction: Beyond logicism in critical thinking. In K. S. Walters (Ed.), *Re-thinking reason: New perspectives on critical thinking* (pp. 1–22). Albany, NY: SUNY.

Yehia, M. (2018, December 17). Final reflection [Blog post]. Retrieved from https://mahmoudyehia.home.blog/2018/12/17/final-reflection

About the Author

Maha Bali is Associate Professor of Practice at the Center for Learning and Teaching at the American University in Cairo. She holds a PhD in Education from the University of Sheffield, UK. She is on editorial boards of several journals of higher education and educational technology. She is co-founder of virtuallyconnecting.org and co-facilitator of Equity Unbound. She is an advisory board member of Erasmus+ Virtual Exchange and OneHE. She is a *learnaholic*, *writeaholic* and passionate open and connected educator.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 82–99
DOI: 10.17645/mac.v7i2.1967

Article

Video Production in Elementary Teacher Education as a Critical Digital Literacy Practice

Diane Watt

Faculty of Education, University of Ottawa, Ottawa, ON K1N 6N5, Canada; E-Mail: dwatt@uottawa.ca

Submitted: 14 January 2019 | Accepted: 14 March 2019 | Published: 11 June 2019

Abstract
This article reports on a two-year, funded, qualitative inquiry into the challenges and possibilities of integrating video production into pre-service teacher education as a critical digital literacy practice. This includes the skills, knowledge, and dispositions that lead to ability to critique and create digital texts that interrogate the self, the other, and the world (Ávila & Zacher Pandya, 2013). Video making holds out enormous potential given our increasingly diverse classrooms and the growing need to have students connect and collaborate within their own communities and globally (Dwyer, 2016; Ontario Ministry of Education, 2015, 2016; Spires, Paul, Himes, & Yuan, 2018; Watt, 2017, 2018; Watt, Abdulqadir, Siyad, & Hujaleh, 2019). Video is especially significant in light of the fact that it is replacing print text as a dominant mode of communication (Manjou, 2018). Multimodal composing such as video production is, in fact, considered by some to be the essential 21st century literacy (Miller & McVee, 2012), but much remains to be done to bring digital technologies as literacy into the elementary classroom. Qualitative data includes a focus group, questionnaires, observations, and content analysis of teacher candidate videos and instructional plans. This study considers how video production can be integrated into teacher education programs to engage cross-curricular expectations and critical digital literacy perspectives. It responds to the pressing question of how to do teacher education differently in the digital age.

Keywords
critical digital literacy; curriculum integration; New Literacies; teacher education; technology; video production

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

> Video making needs to trickle down into the younger grades because it is how we are communicating now. (Teacher candidate)

1. Introduction

The nature of reading, writing, and video communication have fundamentally transformed due to the Internet. The literacy practices needed to function fully in the world today continuously expand as technologies advance. Teachers, teacher educators, and literacy researchers are struggling to keep pace. Even though digital literacy is mandated in every Canadian province, change in the classroom has tended to be slow (Brown, 2017; Daniels, Jacobsen, Varnhagen, & Friesen, 2013; Hoechsmann & DeWaard, 2015; Lotherington, Fisher, Jenson, & Lindo, 2016). This may be understandable given the enormity of the task. Some of the challenges to integration include: a lack of technology in classrooms, inadequate teacher education and in-service professional learning, teacher attitudes and beliefs (Hagood, 2013), an enduring adherence to traditional notions of literacy, and a persistent view of technologies as an "add-on" rather than a central component of literacy today (Daniels et al., 2013; Hoechsmann & DeWaard, 2015).

At the same time, children and youth are often innovators of New Literacy practices as they engage with technologies outside school hours (Ito et al., 2009; Sanford, Rogers, & Kendrick, 2014; Watt, Abdulqadir, Hujaleh, & Siyad, 2019; Watt, Abdulqadir, Siyad & Hujaleh, 2019).

There is generally a gap between the literacies practices students encounter in school and those they engage with on their own time, which puts schools at risk of becoming less engaging and relevant. We have entered into a new era of literacies, and New Literacies (Leu, Kinzer, Coiro, Castek, & Henry, 2013) theory, research, and practices are needed to negotiate this terrain. The current study focuses on how preservice teacher understandings of what counts as literacy dramatically shift after a brief hands-on video making workshop, followed by collaboratively designing an instructional plan that integrates student video production. This research takes place at a large Canadian university in the province of Ontario, but findings may be relevant for techer education programs across Canada and beyond.

2. From Critical Literacies to Critical Digital Literacies

Proponents of new and multiliteracies studies regard literacy as a collection of emerging practices for communicating in diverse and multiple social and cultural contexts (Cope & Kalantzis, 2000; Lankshear & Knobel, 2011; New London Group, 1996). "New Literacies" (Leu et al., 2013) has been proposed as an umbrella term to bring together diverse areas of research, theory, and practice within the ever-expanding field. Alongside traditional print text, New Literacies theory and pedagogies embrace different modes of meaning making (i.e., multimodal)—including visual, audio, spatial, and gestural (Kress, 2010). This broadened notion of literacy accounts for the expanded role digital technologies play in everyday life, including increased contact with difference both online and face-to-face. Multiliteracies pedagogy in teacher education has always been based on principles of social justice and equity, and critical literacies are also an important component of New Literacies theory and practice.

Definitions of digital literacy also encompass a broad and evolving range of topics and issues related to Internet use. As Spires (2018) suggests, there is no consensus on a framework for digital literacies that adequately meets the demands of our contemporary global society. Digital literacies are shaped and defined according to the sociocultural contexts in which they occur, and are continuously expanding as new technologies are introduced. According to a recent survey, those of most concern to Canadian educators include: online safety, appropriate online behaviour, dealing with cyberbullying, privacy issues, and the accuracy of online information (Johnson, Riel, & Froese-Germain, 2016), and educational resources are being developed to address these areas (e.g., Common Sense Education, 2018; Media Smarts, 2016). However, this study looks at the potential of creating and communicating digital content to engage curriculum and critical perspectives in the Freirian sense (Freire, 2000) of critical literacy. Traditionally, the focus has been on the skills, dispositions, and knowledges needed to critically examine power relations through texts. The term, "critical digital literacies" marks a shift to include digital spaces and tools. In this study, video production is thus conceptualized as a critical digital literacy practice. Video technologies allow individuals to "engage with, respond to, and create both text-based and multimodal forms of literacy" (Ávila & Zacher Pandya, 2013, p. 3). Video production is an increasingly significant, yet underappreciated means to foster critical literacies in educational contexts.

Vasquez's (2013) perspectives on critical literacy are also relevant for both the elementary educational context and the teacher education classroom. She does not view critical literacy as an add-on, "but a frame through which to participate in the world" (p. 82). It is not a topic to be taken up, but a lens for teaching across the curriculum. For Vasquez, this implies that "issues and topics that capture students' interests as they participate in the world around them should be used as text to build a curriculum that has significance in their lives" (p. 82). She argues students' cultural identities, lived experiences, and digital literacy practices should be engaged to construct meaningful curriculum. This view resonates strongly with the assumptions underlying the current study.

3. Making the Case for Video

Everyday life, learning, and citizenship today require children and youth to not only be critical consumers of information, but also collaborators in the production of knowledge (Jenkins, Purushotma, Weigel, Clinton, & Robinson, 2006; Ontario Ministry of Education, 2006). Although digital technologies have become an integral part of the social, economic, and political landscape, their use in classrooms remains underdeveloped (Brown, 2017; Johnson et al., 2016; Lotherington et al., 2016; Miller, 2013; Watt, 2017). Lotherington et al. (2016) point out most teacher education programs in Ontario continue to offer only "cursory and superficial" (p. 72), rather than systematic, approaches to the integration of digital technologies. The focus tends to be on technology instruction rather than on how technologies facilitate multimodal learning processes. Brown (2017) similarly finds that the infusion of digital technologies into lesson design is largely lacking in pre-service teacher education across Canada.

Mobile devices and editing software now make it possible to shoot and edit video anywhere, and more needs to be done with video to engage both familiar and new forms of student learning processes (Miller, 2013; Steeves, 2014). Traditional beliefs about what counts as literacy are a key impediment to integrating other modalities such as video into classroom pedagogy (Miller, 2013). A focus on teachers' attitudes toward literacy and learning, however, may lead to change. Hands-on workshops with technologies combined with reflection on multimodal forms of learning may move teachers beyond the belief in a single mode—traditional print literacy. Such experiences help teachers adopt what Bailey (2006) refers to as, "a New Literacies stance." This con-

ceptualization accommodates print literacy beliefs and values, while viewing literacy as dynamic and able to change with new social realities, such as the "digital turn" (Mills, 2010) taking place in literacies research. A New Literacies stance means developing new attitudes regarding the nature, significance, and value of multimodal texts, while recognizing that students who grow up with technology may be quite adept at collaborative learning. To bring critical digital literacy practices into the classroom thus implies challenging teacher attitudes toward, and beliefs about, multimodal literacies, how students learn using technologies outside of school, and what counts as knowing in the digital age (Miller, 2013 p. 404).

In addition, although children and youth are comfortable with these techonologies, they are not using them to full educational advantage (Miller, 2013). This is confirmed by a national survey (Steeves, 2014) of 5,426 students in grades 4 to 11, that considers the role of networked technologies in the lives of Canadian youth. They are "confident and enthusiastic users" (p. 3) of networked technologies, but do not use them to their full potential. For example, although 75% of respondants share videos on YouTube, fully 67% report that they do not creatively use digital media such as posting homemade videos online. This suggests students are major consumers of digital video texts, but seldom utilize this influential medium to create their own messages. Digital and media literacy require students to have the capacity to both critically read and produce digital texts.

Research also indicates students are more likely to succeed academically if they see themselves represented in the school curriculum (Dei, James, James-Wilson, Karumanchery, & Zine, 2000; Ontario Ministry of Education, 2009b). Even in less culturally diverse classrooms students need to be exposed to a wide range of identities and perspectives to develop the ability to negotiate difference in their daily lives, both face-to-face and online. Canada is a multicultural society where respect for diversity and equity are core values even if this will always be an ongoing process. While making videos and designing instructional plans during the video production workshops, teacher candidates also have the opportunity to work with two Muslim female YouTubers from the local Somali-Canadian community. Their very prescence in the classroom as guest speakers and workshop leaders provokes an unsettling of assumptions, for Muslim women are often the subject of media representations rather than producers of knowledge (Watt, 2011a, 2011b, 2012, 2016b). Power relations are disrupted by having racialized black, Muslim, female, youth YouTubers from a community at risk of marginalization, as media experts.

Although a recent study (Johnson et al., 2016) indicates a majority of Canadian teachers are starting to make fuller use of digital technologies in the classroom, many still feel uneasy and ill-prepared to work with students who have grown up with these technologies (Lotherington et al., 2016). Research suggests experienced teachers—who are often assumed to be less technologically adept—may be actually more likely to introduce digital technologies into the classroom, possibly because they are not as concerned about classroom management. They are more willing and better equiped to take risks (Johnson et al., 2016; Johnson, personal communication, 2018). With so much to learn about curriculum, pedagogy, and how to meet the needs of a diverse student population, it is understandable that teacher candidates new to the field might not consider video production a priority. They are also unlikely to experience video making in their teacher education courses or during practicum experiences in the schools. Research confirms teacher education programs are not providing all pre-service teachers with relevant opportunities to learn in technology rich, collaborative environments, and practicum may similarly offer relatively few tech supports for candidates (Brown, 2017; Lotherington et al., 2016). Faculty members who teach in teacher education programs are often, themselves, ill-prepared to integrate digital technologies into teaching and learning. In short, Brown suggests teacher education programs are struggling to keep up with societal needs.

At the same time, even very young children are discovering the power of video to engage and communicate meanings beyond what print text allows. They create and share songs, stories, and drawings privately and with online audiences (Hobbs, 2017; Lange, 2014; Vasquez & Branigan Felderman, 2013). They take photos and make videos as a form of play (Lange, 2014; Wohlwend, 2013). Although media production is mandated in provincial curricula across Canada (Media Smarts, 2018), and students find it highly motivating (Miller, 2010; Mills, 2010; Spires, Hervey, Morris, & Stelpflug, 2012), few studies have been conducted on the use of video production in elementary teacher education programs. This may be due to the fact that video has not been part of the elementary school learning experience until recently, as technologies have become more widely available and easier to use. This research therefore inquires into how teacher candidates (and in-service teachers) can be supported in their efforts to engage curriculum expectations, diverse identities, and critical perspectives through the creation and sharing of digital content using video technologies. This is about much more than acquiring technological expertise.

4. Background to the Study

My previous collaborative research conducted with three YouTubers—Kayf Abdulqadir, Fartousa Siyad, and Hodan Hujaleh—provided the impetus for the current study (Watt, Abdulqadir, Hujaleh et al., 2019; Watt, Abdulqadir, Siyad et al., 2019). That project inquires into the content of their videos, their media making processes, and how their work influenced their sense of identity as media activists from a community at risk of marginalization. Their videos powerfully speak back to dominant representations of Somali and Muslim women

in the mainstream mass media (Watt, 2011a, 2011b, 2012). They are the first females in the Somali diaspora, and among the first Muslim woman, to create and share comedic content online, based on their lived experiences as racialized, Somali-Canadian, Muslim, female youth. Over the course of our collaboration I followed Kayf, Fartousa and Hodan around; listened to stories of their high schooling experiences and growing up in Ontario; discussed their videos and the production process; and co-produced a documentary to bring their work to educators and community audiences. I witnessed their growing awareness of themselves as media activists making a difference in the world. During this time, I was also inspired by the work of educators who create opportunities for youth to make videos to inquire into their own lived experience and promote social justice and intercultural understanding (e.g., Goodman, 2003, 2018; Ratner & Friesem, 2018). Since video technologies have become widely available, relatively inexpensive, and increasingly easy to use, it is long past time that all students experience the transformative potential of meaning making and sharing with this medium.

Teacher education programs are potentially important sites to bring about educational reform. New teachers are exposed to research, theory, and pedagogies in their courses. Even if practicum experiences don't always mirror the most recent innovations, it is hoped recent graduates will be better able to negotiate these complex challenges. I have led video making workshops with numerous students in our teacher education program, both with my own students and at the request of other professors. However, my own areas of expertise is in literacies and curriculum studies, not digital technologies. Could a professor without a background in video production help student teachers learn to make videos? My work with three YouTubers convinced me of the importance of initiating video workshops with teacher candidates. I learned valuable technical skills working with Kayf, Fartousa, and Hodan. Much more importantly, they taught me new ways to approach teaching and learning in the digital age. As YouTubers, they understand the importance of collaboration, distributed knowledge, learning in real-time, persistence, asking for help when you need it, and a willingness to take risks.

My first effort to have student teachers make videos to engage curriculum and critical perspectives was four years ago in a course on the social contexts of schooling, with teacher candidates at the primary grade (K to 3) level. This was an opportunity to test out my ideas on how to introduce teacher candidates to video production as a critical digital literacy practice. During the term we took up a range of social justice issues, including how to negotiate homophobia, racisms, sexism, inequality and priviledge; culturally appropriate pedagogies; issues around representation; and the consequences of absence in the curriculum. Course content provided students with a number of critical lenses through which to consider curriculum. For the final assignment, teacher candidates were asked to create an integrated unit plan in their subject area specializations that involved primary grade students making videos. The class worked in collaborative teams of three or four, and in spite of initial anxieties, together we negotiated technical, curricular, critical, and pedagogical challenges. The videos and instructional plans were inspiring. This is a sampling of the comments teacher candidates made on an anonymous questionnaire:

- We had a lot of fun doing this, and that's what we want for students.
- It's much simpler to make a video than people think.
- Kids who aren't strong writers can express themselves by making a video.
- You can get parents involved with a project like this.
- I can't believe how empowering it felt to make a video. Kids will love this!
- Nobody is an expert....We are all learning all the time.
- We all expressed our unique perspectives in our videos.

The response from teacher candidates at the screening and sharing session was transformative for everyone in the room. Student teachers were deeply inspired by their videos, and by the creative, critical, collaborative, and curricular possibilities offered by multimodal meaning making. It was clear that learning processes involved in video making were unique. Most students articulated the intention to make videos with their own primary students in the future. At this point, it was obvious that video production was worth pursuing with other teacher candidates, especially since few professors involved in teacher education were doing it.

5. The Research Context

This inquiry involves 40 pre-service elementary teachers in an integrated Language Arts/Arts course taught by the researcher, in a two-year teacher education program, at a large Canadian university. This small sample size and the fact that research was conducted in my own classroom might be considered limitations. However, it was important to work with students in depth for the duration of one semester to integrate critical video making into existing required course content. It would have been difficult for another professor to dedicate so much class time for research purposes as I would essentially have had to teach their course.

The elementary Language Arts/Arts course at my insitution prepares candidates to teach the four strands of the Ontario Language Arts Curriculum (Ontario Ministry of Education, 2006) at the Grade 4 to 6 level. These strands include reading, writing, oral communication, and media literacy. The Arts (Ontario Ministry of Educa-

tion, 2009a) components integrated into the course are: dance, drama, fine arts, and music. It is taught from multiliteracies perspectives, with an emphais on the role of student backgrounds and identities in the development of literacy. Classes took place over one semester, meeting for twelve, three-hour sessions. Teacher candidates were in the second semester of a four semester certification program. This was the only literacy course they had taken so far in their program, and they would complete a second course at the primary (grades 1 to 3) level in year two. Student teachers could opt to take the one available stand-alone technology course during their final semester in the program. They had no other technology experiences in any of their course work up until this point. Two research questions guide this inquiry:

> RQ1: How can video production be integrated into elementary teacher education to engage curriculum, diverse student identities, and critical perspectives?
> RQ2: What insights can be gained into how to prepare pre-service teachers to navigate the 21st century classroom in relation to critical digital literacies?

The primary task involved teacher candidates collaborating in teams of three or four to design a multimodal instructional plan to engage cross-curricular expectations (in Language Arts, The Arts, and optionally in other curriculum areas), diverse student identites, and/or critical perspectives. The plan had to be designed as a teacher resource for other educators and posted to the course Wikispace in order to expand the audience for their unit plan beyond the professor. The content of the instructional unit was open-ended to permit students to choose areas of personal interest, and it had to involve students making videos. Each team was asked to produce a short mentor video they could share with their students as exemplars. The mentor videos were screened in class when students shared their instructional plans. Although all teacher candidates indicated they were active on various social media, only two had ever produced a video and shared it online (in a non-educational context), before doing this assignment.

6. Data Collection and Analysis

Visual ethnographic methods are used to collect data and respond to the research questions (Denzin & Lincoln, 2011; Pink, 2007; Rose, 2012), since the teacher-produced videos are a central component of this study. As Pink points out, visual studies usually also incorporate traditional data sources, which is the case with this project. The final product and processes involved in making the videos are inextricably tied up with teacher candidate knowledge, identity, lived experience, and assumptions about teaching and learning literacies. Visual ethnography is therefore appropriate to understand their assumptions and changing conceptions of literacies.

In addition to the student mentor videos, a number of documents were collected and analyzed. These include the multimodal instructional plans created by teacher candidates and a reflective essay to justify the plan, analyze the collaborative video making process, and outline perecived challenges and possiblities of multimodal curriculum design with video. Participants also completed two anonymous questionnaires—one at the beginning of the video workshop and the other on the day the instructional plans were handed in. These were designed primarily to capture understandings of literacy, past experience with video making, and attitudes towards making videos with students before and after the workshops. The researcher and two doctoral candidate research assistants also took photographs and recorded field notes during the video production workshop. One focus group session was held after the end of the term, which was video recorded and transcribed. Participants were asked about their experiences completing the video and the multimodal instructional plan, as well as about their understandings of literacy.

Qualitative data analysis and writing were ongoing before, during, and after the course. Content analysis was conducted on the mentor videos to look for themes, critical perspectives, curriculum connections, and technical aspects. The videos, instructional plans, and reflective essays were independently coded by the researcher and two graduate student research assistants, for emergent themes related to the research questions. We were particularly interested in identifying language and themes related to the process of video making, critical perspectives, and literacies. Interpretation considers evidence from these numerous sources in relation to a New Literacies theoretical and pedagogical framework. The researcher did not know who had agreed to participate in the study, and no data analysis was conducted until final marks were submitted after the course. The video workshop process is transferable to other contexts, but results cannont be generalized based on one example. Tri-council ethics approval involving human subjects was granted from the researcher's university.

7. The Multimodal Curriculum Design Process

A number of experiences during the semester lead up to completion of this final assignment, in which teacher candidates were expected to apply theory and pedagogies they had learned during the course. The sequence of activities was designed to increase knowledge and understanding of curriculum content, in addition to theory and pedagogies related to both traditional print literacies and New Literacies. The Arts component is also treated as an important form of meaning-making, or literacy. Working with an understanding of Arts practices as literacy reinforces an expansive notion of literacies, and helps students to understand the concept of multimodality. Teacher candidates are exposed to print and New Literacies simultaneously and thus experience how

they are not separate, but interrelated and dependent upon one another. Evidence from their multimodal instructional plans suggests a strong appreciation of the synergy that emerges when print and digital texts are integrated throughout the curriculum design process.

Early in the term, student teachers are introduced to the content of Language Arts (Ontario Ministry of Education, 2006) and The Arts (Ontario Ministry of Education, 2009a) curricula, as well as to historic and current understandings of literacies teaching and learning. Critical literacies follow soon after, to underline their significance. It is stressed that teaching children how to read and write is, of course, central to their classroom practice. However, they should never lose sight of the fact that it is what students *do with literacy* that is most important, even at the elementary school level (Willinsky, 2001).

To get teacher candidates thinking about how critical perspectives may be enacted through the use of video technologies, Kayf and Fartousa are invited as guest speakers. They share their YouTube videos and lived experiences as racialized youth from a community at risk of marginalization. After screening their work, they talk about how their videos are inspired by their family experiences and cultural background as Somali-Canadians. They also discuss their experience of absence in the Ontario Curriculum, and how they had to negotiate stereotypical representations of Muslim women in the mass media as high school students in the years following 9/11. Through the use of humor—both in person and in their videos—Kayf and Fartousa open up critical conversations in a less threatening way. By laughing at themselves, they make others feel at ease, which leads to difficult conversations around difference.

This guest speaker session serves a number of purposes: 1) teacher candidates have an opportunity to meet and talk with racialized, Muslim female youth, who, for virutally all members of the class, are from a different religious and cultural background; 2) having Somali-Canadian, Muslim females talking about making videos instead of being the subject of media portrayals, disrupts power relations; 3) personal narratives of the potential transformative power of representing oneself through making and sharing YouTube videos legitimizes New Literacies practices children and youth are involved in outside the classroom and highlights their significance; and 4) student teachers become curious about how video production might fit into their own school contexts. In other words, this session performs video making and sharing as critical digital literacy practice. By being part of this face-to-face conversation on YouTube videos, teacher candidates are invited to participate in a meaningful conversation on difference. Screening and responding to videos is an engaging way to involve students in critical reflection and discussion on difficult topics.

The final assignment is introduced the following week, mid-way through the semester. Teacher candidates then participate in a three-hour video production workshop as preparation for completion of the multimodal instructional plan. Students complete a short questionnaire to identify their previous experience with, and attitudes towards, video production. A short reading introducing student filmmaking (Hutchison, 2012) and simple video making resources are posted to the class Wikispace before this session as resources for anyone interested (e.g., shot sheets, blank storyboards, a chart with steps in the video making process, cross-curricular suggestions for video projects, and ideas for different approaches to representation such as puppets). Students are asked to form groups of 3 or 4 before the workshop. One member of each team must have a device with a camera. All of the videos end up being shot on mobile phones.

8. The Video Production Workshop

To set the stage on the day of the workshop, the class begins by having teacher candidates respond to the following question: What do you consider to be the benefits and challenges of having elementary students make videos in the classroom? The answers are posted anonymously on a screen at the front of the class using *Padlet*, an online bulletin board. The responses appear in Table 1.

Over the past three years, I have asked the same question to more than 500 teacher candidates at the beginning of video production workshops, and the pattern of answers has been similar for each group. There are generally more concerns than posssible benefits, suggesting resistance or lack of awareness about the potential of video. Before teachers have the experience of making a video, themselves, it's potential for multimodal meaning making tends to be vastly underappreciated. Most teacher candidates have had no experience with video production during their own schooling.

My research team and I then briefly review steps in the video making process, offer basic tips such as the importance of paying attention to sound quality, and provide storyboards. Students are prompted to plan, shoot, and publish a 30 second one-shot video, to be screened during the last 20 minutes of class. They are expected to create a student mentor video that could be shown to their elementary students as an exemplar (as part of their instructional unit). In terms of subject matter, groups choose a topic from any curricular area, but there must be strong links to the Language Arts Curriculum, with connections to The Arts. At this point, teacher candidates are also encouraged to think about how they could make their video critical and we discuss some examples.

Editing is not required, but most groups choose to undertake simple editing. Kayf, Fartousa and two graduate students are on hand to help out with any technical or creative issues that arise. We purposely avoid explicit teaching of technical skills. Students are expected to learn in their collaborative groups and get help from our team, if needed. This makes them feel support is available, but they soon realize they are capable of cop-

Table 1. Challenges and benefits of making videos in the elementary classroom.

Challenges of having elementary students make videos in the classroom
• I don't know anything about video or editing.
• I have never made a video before.
• There are so many other more important things we need to learn in our teacher education program.
• Access to technology is limited in schools. Is it expensive?
• It takes too much class time and effort for students to make a polished video.
• Privacy and safety issues with kids filming one another and sharing online.
• Video may be too distracting and kids might fool around too much. It might be hard to manage.
• Need for parental consent.
• It's too risky.
• I would only do it after I had the proper training and ongoing support.
• We already have so many responsiblities. It's too much.
• I haven't seen any teachers in my school doing this. Is it even allowed?
• There could be tech failures and I wouldn't know what to do.
• I worry kids could damage the equipment.
• How would you evaluate a video?
• Is it in the curriculum?
• Kids already spend too much time on screens.
• Students might be overstimulated.
• Some kids might not want to be filmed.
Benefits of having elementary students make videos in the classroom
• It engages many types of learners.
• Students who struggle with traditional literacies might excel making a video.
• We need to keep up with new technologies.
• Kids would find it fun.
• It encourages creativity.
• Videos could be shared with many audiences, including families and other classes.
• It is another way to demonstrate learning.
• It would be good to use with students who are anxious about public speaking.
• It's a platform where students could raise important issues.
• Kids need to learn to use different technologies.

ing within their teams. Seldom do teacher candidates ask for assistance at this stage. Once they are convinced of the value of video making as a significant literacy practice they can pursue other opportunities to develop technical expertise if they are interested, but this is not necessary.

As the professor, it is important to decenter as "knower" to disrupt the notion that a teacher must know more than students, and to model a collaborative approach to teaching and learning. Everyone is expected to learn with, and from, one another and to access readily available online resources if needed. By the end of this session teacher candidates have a better appreciation of the concept of distributed expertise and the benefits of sharing knowledge, skills, and power with students in the digital classroom. Along with experiencing the power of collaboration and learning-as-you-go, this is one of the main goals of the workshop. The de-emphasis on technological skills and time pressure create the conditions in which collaboration is necessary to get their video ready in time for screening. Some students will have some technical expertise, others will write the script, while others will be willing to act in the video. I first witnessed this approach to video making during a workshop for Israeli and Palestinian youth, led by Dr. Yonty Friesem at the Summer Institute in Digital Literacy at the University of Rhode Island. Team members had to rely on one another to get their videos made in time for public screening. Rather than focus on technological skills, the emphasis is on teamwork and comprehensible content. There have only been two groups over the years who did not meet the screening deadline at the end of a workshop. This was because they had members with video experience and their projects became too complex to finish in the time allotted, so their screening was delayed until the following class.

Some of the student teachers were anxious at the start of the workshop. Most had never made a video before and imagined it to be difficult. After instructions were given, everyone got to work quickly and focused intensely on the task. There was soon a high level of engagement, with much talk and laughter in the classroom and hallway where students were working. Some groups used puppets from the resource center and others acted in their videos. Once everything was posted to

YouTube it was time for the screening. Teams were visibly relieved they were able to meet the deadline. They were proud and many were surprised to be able to produce a video to share with classmates. Each group introduced and screened their work, and the class response was overwhelmingly positive. Everyone seemed to feel the excitement and a sense of accomplishment. Teacher candidates are also surprised at how easy it is to make a video, which opens up thinking about what is possible with students.

9. Results and Discussion

9.1. Elementary Pre-Service Teachers Make Videos: Attitudinal Shifts

Survey responses on the pre-workshop questionnaire and interview data from the focus group session indicate that at first the majority of teacher candidates were positive, even if somewhat uncertain, about the value of making videos with elementary students. It may be that most thought this seemed a good pedagogical strategy, but they did not know what that might look like. They were concerned about a lack of technical skills, questioned the relevance of using student-made videos to engage curriculum expectations, and did not consider video making a practical classroom activity due to time constraints and technological requirements. Many also wondered if video production could be too distracting or difficult for students in the elementary grades.

This was the first time video had been introduced in their teacher education program, and none of the teacher candidates had seen student-produced videos during practicum or in their own schooling experiences. However, questionnaire data collected after the instructional plans were finished indicate that participation in the collaborative process of multimodal curriculum design led to postitive attitudinal changes. Table 2 provides a summary of this shift.

The most significant result according to the final questionnaire was that 100%—all teacher candidates in the class—indicated they plan to have their future students make videos to engage curriculum and digital literacies.

Candidates were surprised making a video was much easier than they had anticipated, and most found it enjoyable and engaging. Student teacher reflections on the process from the focus group discussion suggest a high level of enthusiasm after the hands-on experience making videos themselves, followed by having to incorporate video making into an instructional plan:

> I'm very inexperienced with video and technology. I find technology very daunting and I don't really like videos on my phone or anything like that. I don't know how to upload or edit them, so I really have no experience. This project stressed me out in the beginning because I didn't really know what we were going to have to do. When Diane mentioned video production, I was like, "Oh, my God!" [laughter], but it wasn't that hard after we did it. It was the collaborative part that made it work. You had support from your colleagues.

> I was so impressed with how much everyone got out of making videos in this course.

> You could see how excited many people were making their video. I would never have thought of bringing video into my teaching before this. It was such a new idea to me.

These comments coincide with our team's observations of teacher candidates during the video workshop. There was doubt at first, but by the time the videos were screened at the end of class, trepidation shifted to enthusiasm. Participants recognize video making is new in most classrooms and understand they are being initiated into a practice that has a great deal of potential.

After the workshop, student teachers view the technical aspects of video making as within their reach, and they recognize the benefits of collaboration on a technical task most assumed was beyond their level of knowledge and technical expertise. A number of students noted that they benefited not only from learning how to make and share a video with other members of their team, but also from viewing the videos other groups had created:

> This experience made me more comfortable bringing video into the classroom. I think I was still a little tentative about the assignment after we were done. We weren't sure that we went into enough depth with the

Table 2. Teacher candidate attitudes to video production in the elementary classroom before and after designing a multimodal instructional plan.

Before Completing the Video Workshop and Multimodal Instructional Plan	After Completing the Video Workshop and Multimodal Instructional Plan
73% of teacher candidates did not feel confident integrating video into instruction to engage curriculum and critical perspectives.	93% of teacher candidates felt confident integrating video into instruction to engage curriculum and critical perspectives.
64% believed students could benefit from making videos in the classroom.	100% believed students could benefit from making videos in the classroom.

> critical part. During the screening, when we saw what all the other groups had produced we got a much better idea of what it means to be critical and how we could bring that into the classroom using video. It was very helpful to watch other people's videos.
>
> I got so many great ideas from watching the videos made by my classmates. I really want to get the kids to make a video on my next practicum placement.
>
> It was so great to see so much engagement in our class. We aren't always that excited by what we do in teacher education. Even though students in our class didn't have much experience making videos, we forged ahead together. I think its important to take risks, ourselves, because we are asking kids to take risks. You don't always understand an assignment or a technology, but you have to struggle through it and I think this helps you grow.

Student teachers articulate the benefits of collaborating on a curriculum design project and of sharing work with other educators. With so many demands on teachers today—including the need to integrate digital technologies into the curriculum—collaboration on curriculum planning has become essential, and also enriching in terms of professional learning (Knobel & Kalman, 2016). Unfortunately, although collaboration is often promoted in teacher education programs, these programs tend to require students to complete assignments independently for fear that grades may not accurately reflect individual achievement. This is one of of the issues we need to work through as educational paradigms shift. If collaboration is truly valued, how must assessment and evaluation transform?

9.2. The Multimodal Curriculum Design Projects: Engaging Curriculum and Critical Digital Literacies

In addition to a more "can-do" attitude regarding the technical aspects of video production, and a stronger understanding of the benefits of collaboration in the digital classroom, focus group data and content analysis of the instructional plans also indicate student teachers had a good grasp of how to use video making to integrate cross-curricular expectations and critical literacies into instruction. My research team analyzed the unit plans and accompanying student mentor videos the teams of teacher candidates completed collaboratively as the final assignment in the course. Content and themes were identified to look for evidence student teachers were able to apply new skills and understanding by integrating student video production into a unit of study in Language Arts (with the option of including other subject areas), to engage curriculum expectations and critical perspectives. We also sought evidence that understandings of literacy had expanded, which is discussed further below. In total, 10 assignments were analyzed. All groups successfully integrated traditional print and New Literacies perspectives into a Language Arts unit plan, and engaged curriculum expectations and critical perspectives.

Teacher candidates chose critical content they were familiar and/or comfortable with, with some groups going further than others. Students come to teacher education from various academic backgrounds, and those from disciplines more focused on critical perspectives found the task easier. A number of critical issues are taken up in the instructional plans, including environmental sustainability, identity and difference, intercultural understanding, and gender. In several of the unit plans, students deconstruct representations to identify who is portrayed and who is left out. After a unit of study, most of the videos involved students sharing their research, knowledge, understanding, and/or identities with audiences beyond the classroom to inform and to inspire change. For example, in one instructional plan students are asked to create a news broadcast to think critically about endangered animals and the impact humans have on their habitat and community. The unit plans describe the purpose and audience for the student videos:

> Students will direct their videos to the school community and encourage their peers to make conscious choices when in a natural environment. The student's videos will capture the attention of their school community by using real-life facts on their chosen endangered animal and ways in which we can change our lifestyles to promote healthy habitats and communities.

Other topics taken up in the instructional plans include: an anti-bullying awareness campaign; creating non-stereotypical news stories; challenging gender stereotyping in advertisements for children's products; telling a fairy tale from a different perspective; writing a personal anthem based on student identities and interests; a novel study that focuses on critical thinking; creating a public service announcement on endangered animal species; and a critical approach to exploring identity through dance. Critical digital literacy practices offer opportunities for students to become designers of powerful texts (Kress, 2010). As Ávila and Zacher Pandya (2013) remind us, in the context of participatory culture (Burgess & Green, 2009; Jenkins et al., 2006), they offer alternative methods of teaching and learning that potentially disrupt traditional banking systems of education (Freire, 2000).

Critical pedagogical strategies used in the unit plans include: discussion, writing tasks, reflection, questionning, deconstructing media representations, and producing digital/media messages. A number of the unit plans have students viewing and critiquing videos before they create their own. This is a key strategy, for students need experience analyzing how multimodal texts make meaning in order to produce digital texts that communicate effectively. Student teachers also built in opportuni-

ties for critical feedback from various audiences during screenings of rough cut videos and during final screenings, which opens up additional spaces for critical conversations. One group explains:

> Students will screen their videos in the library as part of a film festival. Classes will be invited to view student films at their individual tables and students will have the opportunity to explain their video, the production, and their critical examination of news stories.

Given their limited knowledge of video production at this point, most groups chose not to formally evaluate technical aspects of the student videos, but instead focused on effectiveness of communicating the message, organization, and evidence of knowledge and understanding of curriculum expectations. Of course, technical choices affect meaning making, but teachers recognized this would gradually become more sophisticated as they and their students gained more experience with video. Some of the unit plans also evaluate collaborative skills, which, again, illustrates the degree to which teacher candidates considered community building to be one of the most significant benefits of video production.

Following is a closer examination of three of the multimodal instructional plans. These were chosen to illustrate the broad range of cross-curricular topics and pedagogies taken up by teacher candidates. The first, designed for Grade 6, engages gender roles through a study of advertising directed at children. The authors demonstrate how video production can be used to engage cross-curricular expectations and critical perspectives. The second unit plan has Grade 4 students critically evaluate whose point of view is presented in a text and identify missing or alternative points of view, through rereadings of traditional fairy tales. The student mentor video represents the wolf's point of view in the story, *The Three Little Pigs*. In the third instructional plan, designed for Grade 5, students take up a critical perspective on traditional dances from around the world. The focus on intercultural understanding opens up a space to bring diverse student identities and cultures into the classroom and is thus an important example of how video can engage multiliteracies perspectives.

9.2.1. Example 1: Gender Roles and Stereotypes in Advertisements for Children's Products

As one team notes in the introduction to their instructional plan, "video making is a wonderful way to integrate curriculum expectations." All groups successfully integrated Arts and Language Arts curriculum expectations into their plans. However, most went well beyond this basic requirement to include other curriculum areas such as Science, Social Studies, and Health. This unit on gender roles and stereotypes in advertisments for children's products integrates cross-curriculuar expectations while taking up critical perspectives on gender. Students at the Grade 6 level can relate to the topic of gender roles and advertising, making this a developmentally-appropriate means to engage these key areas of critical literacy. The unit is summarized in the introduction:

> During the unit students critically analyze the implications of gender roles and stereotypes. They begin by comparing two commercials advertising the same product, but each has a significantly different intended target audience, based on gender. The class analyzes and discusses how this product is presented differently to girls and boys. They will aquire a working understanding of how stereotypes about gender and gender roles impact the human development and self concept of others. They will also learn appropriate ways to deal with and modify these assumptions and stereotypes by creating their own media texts. Students work in teams to apply their understandings by designing and filming a commercial for the same product that is gender neutral.

The authors of the unit plan explain how it integrates cross-curricular expectations from Language Arts (reading, writing, and media literacy), The Arts (drama), and Health and Physical Education (human development and sexual health). They describe how it engages critical literacy skills to evaluate gender roles and stereotypes in advertising (although they do not critique binary gender identities), and that New Literacies are developed as students create videos to apply and then share their understandings.

The student mentor video depicts people playing with the product, which is a play dough. Only hands and arms are filmed, and subjects wear black, so no explicit allusions are made to gender. The use of a variety of colours also disrupts a particular colour being associated with being female or male, also opening a space for the existence of other gender identities (Figure 1). This contrasts with the two advertisements students critique together, which specifically target girls and boys using colour and themes. This student mentor video provides a comprehensible alternative to the product's stereotypical ads, scaffolding student learning.

In their reflective essay, these teacher candidates draw upon concepts taken up during the course in class activities and readings to justify their curriculum design choices. This is an opportunity to apply what they have been learning all semester. For example, they reference a number course readings related to literacies and equity, including Ontario Ministry of Education policy documents. This excerpt from the unit plan describes how power circulates in media representations, and explains how a child's gender identity is formed gradually, with media being an influential site:

> Watching little girls play with dolls, and little boys play with trucks can have a huge impact on shaping the identity of a child. It could also be an issue when an in-

Figure 1. Student mentor video depicting neutral gender roles in advertising for children.

> dividual child doesn't fit into the roles on offer in the media. This unit gives students the opportunity to critically analyze factors that may have shaped their own sense of identity.

This team also mentions the power of video making to encourage creativity and facilitate the learning process. They argue assignments that ask students to make videos to demonstrate understanding and share their perspectives are also likely to foster a love of learning given that many students find video enjoyable and motivating. The final student videos are assessed on curriculum and critical content as well as depth of understanding of stereotypical gender roles.

This multimodal instructional plan thus provides an example of how video production as a critical digital literacy practice can be integrated into the Grade 6 curriculum. With no previous experience or available exemplars, these teacher candidates engage the topic of gender stereotyping, and bring together numerous curricular areas of inquiry by focusing on critically reading and producing digital video advertisements.

9.2.2. Example 2: A Fractured Fairy Tale: The Three Pigs and the Big Sick Wolf

This second instructional plan for Grade 3 or 4 students contributes to understandings of how to engage critical literacy with younger children (Vasquez, 2013; Wohlwend, 2013). The unit invites students to reread traditional fairy tales from an alternative point of view. Fractured fairy tales are not new to the literacy field, but the practice of rereading is only one half of the critical literacy process. Students also need to be able to create their own meanings, which is where video production can be introduced. As the authors of this unit contend, "it is important for students to understand the various ways they can create meaning without pen and paper." Like other groups, the designers of this unit note:

> Students will demonstrate their ability to express their thoughts and ideas in a new format. By using a multimedia platform and creating a short video, students will be involved in traditional print literacy practices before they even begin the filming process. They will complete lessons and activities that include brainstorming and planning; and rewriting scripts by modifying the plot, setting and/or characters. Students will critique and offer peer assessments of their classmates' videos and written work.

Again, video (Figure 2) greatly expands opportunities for sharing and critique, which makes it an appropriate medium to engage not only disciplinary knowledge, but critical digital literacies.

This group draws from Harste (2014) to emphasize the importance of transmediation in the classroom. They explain that "oving across sign systems (from language to art, for example) has been shown to generate new ideas and new insights" (p. 91). In the introduction to the unit, teacher candidates lay out that during this unit of study, through video production "students are able to portray a variety of emotions and sensations that would often be lacking in a written piece." They write that "by offering students the opportunity to express themselves using a variety of multimedia forms we are creating a dynamic and engaging learning space." Throughout the course the importance of student engagement was stressed, and based on their own experiences during the video production workshop, student teachers came to view video as a meaningful way to motivate and engage their students.

These teacher candidates go on to justify their curriculum design by emphasizing links between traditional print literacies, digital literacies, critical literacies, and transmediation:

> Transmediation is an overarching feature of our lessons in which students listen, interpret, and perceive fairy tales in a certain manner and are asked to reimagine

Figure 2. Screenshot of student mentor video: The dramatization of *Three Little Pigs* from the wolf's perspective, using stick puppets.

> this tale from another point of view….They are then asked to express it using digital video technology.

This team also articulates the need to bring critical literacy into the elementary curriculum to help students identify, reflect on, and analyze power relationships in texts. Their focus on how print and digital stories can be interpreted from different perspectives is an important component of a strong critical digital literacy practice.

9.2.3. Example 3: A Critical Approach to Inquiring into Identity Through Dance

This group inquires into identities and cultures through dance during the video production workshop (Figure 3). Their student mentor video consists of a series of short dance clips found online that represent their own cultural backgrounds. To make their video, they taught themselves how to import short clips from YouTube into an iMovie template. During the screening, it was inspiring to hear their account of learning about one another during the process of making their video in the workshop. These pre-service teachers explained how the curation and sharing of cultural texts to include in their short student mentor video lead to better understanding of one another's identities and cultures. They were also surprised at how the act of collaborating on a short video helped them get to know one another, and now viewed video making a powerful community-building strategy. Multiliteracies theory stresses the importance of community and bringing student identities into the curriculum to promote literacy development. If learners do not feel like valued members of the class and/or do not see themselves represented in the curriculum, they risk marginalization (Dei et al., 2000; Watt, 2011a, 2011b).

This team's multimodal instructional plan mirrors their lived intercultural experiences during the initial video workshop. In the introduction, the authors explain

Figure 3. Screen shot of student mentor video on critically inquiring into identity and culture through dance.

their unit promotes critical literacy by encouraging students to ask questions and reflect as they create their own video and read the videos that other students make. They underline what they consider most significant in their Language Arts/Arts unit of study:

> This dance activity promotes diversity and acceptance among students and awareness of other cultures. Students are able to learn through collaboration with peers.

One of the activities in the unit involves a critical discussion of the issue of representation in the media and whose voices are excluded. The main assignment requires students to work in groups to create a dance video that represents their own families and cultural backgrounds. Students use YouTube as a resource and must include a voice over that explains meanings represented in the dances. Through this process, it is hoped students will challenge assumptions by learning more about themselves and others. The unit integrates expectations from the dance strand of The Arts Curriculum (Ontario Ministry of Education, 2009a), which madates that students at the Grade 5 level demonstrate and understanding of a variety of dance forms, traditions, and styles from past and present, and their sociocultural and historical contexts. In addition, all four strands of the Language Arts Curriculum (2006) are engaged in this unit, including oral communication, reading, writing, and media literacy.

This example highlights that there is much more going on during the three-hour video production workshop than the acquisition of technological expertise. Here, teacher candidates focus on critical content and curriculum expectations from The Arts and Language Arts. The process of making a video collaboratively becomes the site where students (and teacher candidates) actively engage with curriculum, critical literacy, and colleagues to co-construct new understandings of identities and cultures. As this unit plan demonstrates, the multidimensional aspect of video production as both process and product opens up new venues for teaching and learning in the digital classroom.

9.3. Expanded Understandings of Literacy

There is also evidence to suggest that participating in a simple hands-on video production workshop followed by a curriculum assignment requiring the integration of video production into a Language Arts instructional plan, expands teacher candidates' understandings of what counts as literacy. In their unit plans and reflective essays, student teachers integrate literacies theory and pedagogies introduced during the term. The instructional plans as a whole demonstrate that participants' understanding of video as a different form of meaning making was strong. Although not every student teacher explicitly mentions multimodality as an key feature of meaning making with digital video, it was often implied in the unit plans, the reflective essays, the focus group session, and the questionnaire responses. Teacher candidates made the following insightful observations about the significance of video making:

> Constructing meaning with video is unique because it's your whole body. You experience it through all of your senses when making it, but when screening it, too! To watch the images and see someone in action, the movement, it adds another layer of meaning. I think a lot of kids at the elementary level have an easier time expressing themselves through acting or moving. Some kids can't write down an idea on paper, but they could act it out. Some kids would be more comfortable making a video over writing a poem.

> In this course I have come to appreciate digital literacy more than I did before. I now appreciate how much video can add to the Language Curriculum. There is so much you can do with it.

> Even with getting kids to make identity texts...it's such an important way for people to be able to express themselves.

> I think about literacy differently now. Video can help me communicate with the world. It is so complex. You have to think about movement, the use of colour, body positions. It's all those little things that you might not think about reading a book or a print text. Video lets you share experience differently.

> With our world immersed in social media platforms such as Facebook and Instagram, our youth grow up in a digital world that they need to understand and be able to apply to their everyday ives….Youth and children can use these to find a voice for themselves, so educating students on the benefits and proper use of these technologies is important….Incorporating video production into our teaching allows for students to express themselves in ways that pen and paper simply cannot. This is a very different, yet interesting and fun way for students to learn.

> I see the importance of bringing in video now. We didn't do much media literacy on my practicum. I am much more excited about taking this into the classroom and helping young kids learn to use video technology. I have a degree in English, so have always been into books. I'm very old fashioned, but now I'm seeing the benefits of incorporating new technologies and new media into the classroom.

These teacher candidates appreciate the affordances of video, and recognize meaning making using this technology as complex. They see that video (and other digital technologies) does not replace traditional print literacies, but reinforces and extends them. Even an English

specialist who loves books and admits to being "very old fashioned" concludes that video should not be ignored by teachers. Many make connections between the ubiquitous use of digital technologies outside the classroom and what is happening, or not happening, in our elementary schools. Conceptions of literacy greatly expanded when these teacher candidates had the opportunity to experience the affordances of video production first hand and then design their own multimodal instructional plans. Teacher candidates no longer viewed traditional print literacies and New Literacies as separate. In all of the multimodal unit plans, there was strong evidence they understood the potential of combining traditional print literacies with New Literacies, through preproduction activities such as researching, discussion, storyboarding, script writing, and planning. They also suggested opportunities to engage traditional forms of literacy post-production through follow-up activities, including oral and written feedback and critique to other groups, reflective writing, and discussion sessions with various audiences. The possibilities are endless.

Every group in this study went beyond what was expected with this assignment, because they found making videos engaging and relevant for their students. A number reported this as their favourite assignment in the program. They were impressed by how making videos fosters collaborative skills and a sense of community. Having students make videos is also a powerful way to engage cross-curricular expectations. Significantly, all participants stated that they plan to have future elementary students make their own videos.

10. Implications for Teacher Education

Returning to the research question on how video production can be integrated into elementary teacher education to engage curriculum, diverse student identities, and critical perspectives, the short answer is that it may be easier than one might expect. As this research demonstrates, a single collaborative hands-on experience working with video technology followed by an opportunity to integrate that technology into an instructional plan, led to significant changes in teacher candidates' attitudes and perspectives on literacies, curriculum integration, and the importance of new communication technologies. This one experience with video making and curriculum design convinced teacher candidates of the significance of video to promote traditional and new forms of learning, even with students in the elementary grades. They left the course more confident about introducing video production into the classroom by rethinking their own assumptions about teaching, learning, student-teacher roles, and expertise in a participatory culture. By grappling, themselves, with the technical challenges and curricular possibilities related to video production, they become convinced of its unique qualities and value. They experienced the potential of expansive and unique forms of meaning making now available to students through the combination of traditional print literacies, critical perspectives, and digital technologies.

With regards to how to prepare pre-service teachers to navigate the 21st century classroom in relation to critical digital literacies, this study demonstrates that it begins with teacher educators and their willingness to take risks. Like student teachers, they also need to be convinced that advanced technological expertise is no longer required to introduce video production (and other digital technologies) into their courses. It is much more important to create space in a given course for teacher candidates to inquire into how video production represents a different way of learning that engages new forms of knowledge construction essential for critical literacy in the digital age. Teacher educators need to decenter their own authority to disrupt traditional student-teacher roles, which are no longer appropriate in the information age. Teacher education programs should model collaboration and power-sharing between teachers and students, where everyone learns from everyone (Hobbs & Coiro, 2016). This implies that teacher educators acknowledge that given rapid and continuous technological advances, they are also always learners.

11. Recommendations

This inquiry demonstrates that teacher candidates' learning in this course was transformational. Integrating video production into elementary teacher education not only greatly impacted teacher candidates' understandings of what counts as literacy. When integrated into the curriculum design process, it is an effective means to engage cross-curricular content, diverse student identities, and critical perspectives. The multidimensional attibutes of digital video make it the ideal technology to introduce into teacher education programs to help pre-service teachers gain the perspectives, dispositions, and confidence they need to navigate the 21st century classroom. Most importantly, video production facilitates the development of critical digital literacies, which are essential for life, learning, and citizenship today.

A number of observations and recommendations emerge from these findings, which may inform teacher education programs as well as professional learning for in-service teachers:

1. Video making promotes multidimensional learning. It can be the focal point of student inquiry. During the process of making a video students develop valuable collaborative and community-building skills and dispositions that are transferable to other contexts. In addition, print literacies and oral communication skills are engaged and reinforced, promoting these all-important traditional literacies alongside digital literacies. Videos also become products that can be shared face-to-face or online, opening up access to broader audiences and feedback. Having teacher candidates make their own videos in teams exposes them to the many the affordances of video production.

2. Making and sharing a video is not difficult. Although many educators assume video is difficult to learn, time-consuming, and too challenging for elementary students, this research and my work with numerous teachers (Canadian Institute for Digital Literacies Learning, 2017; Critical Digital Literacy Project, 2018), students, and teacher candidates dispells this notion. More advanced technological learning can come later, if and when it is required. The point is to be willing to get started by learning with and from colleagues and students, for we learn by doing (Knobel & Kalman, 2016).

Teacher educators do not need to be technology specialists. In fact, it is good practice to decenter one's authority, share power with teacher candidates, and model risk-taking. New teachers need to experience what this looks and feels like, so they will be more likely to take similar risks in their own classrooms.

This research demonstrates making a single video collaboratively is enough to instill confidence, and because it is enjoyable to make and see the final product, people get hooked and want to do more. It is enough to create a space in the classroom that invites experimentation, while providing whatever support one has access to, such as articles, website resources, YouTube tutorials, and/or youth media makers or colleagues willing to share their work and offer support. Once teacher candidates have made a video, follow up by having them integrate video production into a curriculum design project related to course content. This is where much of the deep learning occurs.

3. The experience of video making expands teacher candidates' understanding of of what counts as literacy. Research has shown that teacher attitudes are key to change in the classroom. The teacher candidates in this study no longer viewed collaborative multimodal meaning making with video technologies as optional. After completing this project, they understood the uniqueness of multimodal meaning making as complex learning and powerful communication. They also considered digital literacies to be as important as traditional print literacies.

4. There is no need to drastically change what you are already doing. The sequence of activities teacher candidates completed in order to create their multimodal instructional plans was not novel or complicated. The only new element was the video making. This means that any teacher educator could potentially make this one addition to their course to open up vast new possibilities for teaching and learning.

5. Teacher candidates should be invited to take the lead. By the end of the semester—even though they had never done it before and had few exemplars to follow—all of the participants in this study were able to make and share a video, and then meaningfully integrate student video making into a cross-curricular instructional plan to engage curriculum expectations and critical perspectives. Positioning pre-service teachers as knowledge generators (Simon, 2013) and classroom innovators may be key to their development as critical digital literacy practitioners. In a course on integrating technology across the curriculum, I ask teacher candidates to work in groups to develop and lead a workshop on integrating digital technologies for future colleagues they will work with after they are hired on as certified teachers. They either draw upon current skills and knowledge, or they may choose to research a technology they are interested in for a particular curricular purpose. Through this activity they experience what learning looks like in the information age where expertise is one click away. By teaching colleagues, candidates gain confidence as they develop a DIY ethic (Knobel & Lankshear, 2010; Ratto & Boler, 2014), which is needed to navigate our networked classrooms and societies.

6. Video making is an exemplary critical digital literacy practice. The teacher candidates in this study successfully designed instructional plans that engaged critical perspectives in the elementary classroom. Making and sharing videos potentially lends itself to classroom inquiry projects that focus on important social justice issues of interest to students when students are simultaneously introduced to critical perspectives. Video also expands possibilities for student voice to reach communities beyond the classroom and the school, potentially making learning more relevant and authentic. Students find sharing their identities, lived experiences, and perspectives with others through video production represents engaging and empowering learning.

12. Scholarly Significance

This research contributes to New Literacies theory and practice, curriculum studies, and teacher education by offering insights into how to shift teachers' understandings of literacies and critical perspectives through the integration of video production into the curriculum. In broad terms, this investigation contributes to understandings of what knowledge and skills are required to thrive in an interconnected, evolving global landscape. Research, policy, and practice must take into account the transformed nature of literacies in the digital age. The process of teaching and learning New Literacies is new to many educators and involves more than just access to technology. Curriculum, pedagogy, and teacher education must be reimagined. This research takes up this pressing challenge. As Williamson (2013) reminds us, "[a] paradox of teacher education is that we must prepare teachers for the schools we have while at the same time we must prepare them for the schools we want" (p. 2). In our diverse, networked societies, new technologies are introduced continously, and elementary school educators need to contend with this shifting reality (Leu et al., 2015). Our schools must adapt to continuous change, and teacher education has an important role to play in this transformation (Watt, 2016a). The integration of video production as a critical digital literacy practice into our teacher education programs may represent a simple, but effective means to negotiate many of these current challenges.

Acknowledgments

Funding for this research has been provided by the Social Sciences and Humanities Research Council of Canada through an Insight Development Grant. Thank you to my research team for their valuable contributions to this project: Jamilee Baroud and Genevieve Cloutier (Doctoral Candidates at the University of Ottawa); Fartousa Siyad, Kayf Abdulqadir, and Hodan Hujaleh (YouTubers and Youth Media Activists).

Conflict of Interests

The author declares no conflict of interests.

References

Ávila, J., & Zacher Pandya, J. (2013). Traveling, textual authority, and transformation: An introduction to critical digital literacies. In J. Ávila & J. Zacher Pandya (Eds.), *Critical digital literacies as social praxis: Intersections and challenges* (pp. 1–12). New York, NY: Peter Lang.

Bailey, N. (2006). *Designing social futures: Adolescent literacy in and for new times* (Unpublished doctoral dissertation). Buffalo State University of New York, New York, NY.

Brown, E. (2017). *Exploring the design of technology enabled learning experiences in teacher education that translate into classroom practice* (Unpublished doctoral dissertation). University of Calgary, Calgary, Canada.

Burgess, J., & Green, J. (2009). *YouTube: Online video and participatory culture*. Cambridge: Polity Press.

Canadian Institute for Digital Literacies Learning. (2017). *Canadian institute for digital literacies learning*. Retrieved from http://www.digitalliteracies.ca/welcome-2

Common Sense Education. (2018). Educator resources for digital literacy. Retrieved from https://www.commonsense.org/education

Cope, B., & Kalantzis, M. (2000). *Multiliteracies: Literacy learning and the design of social futures*. London: Routledge.

Critical Digital Literacy Project. (2018). *Critical Digital Literacy Project*. Retrieved from https://thecriticaldigitalliteracyproject.com

Daniels, J., Jacobsen, A., Varnhagen, C., & Friesen, S. (2013). Barriers to systemic, effective, and sustainable technology use in high school classrooms. *Canadian Journal of Learning and Technology*, *39*(4), 1–14.

Dei, G., James, I., James-Wilson, S., Karumanchery, L., & Zine, J. (2000). *Removing the margins: The challenges and possibilities of inclusive schooling*. Toronto: Canadian Scholar's Press.

Denzin, N., & Lincoln, Y. (2011). *The Sage handbook of qualitative research* (4th ed.). Thousand Oaks, CA: Sage.

Dwyer, B. (2016). Teaching and learning in the global village: Connect, create, collaborate, and communicate. *The Reading Teacher*, *70*(1), 131–136.

Freire, P. (2000). *Pedagogy of the oppressed*. New York, NY: Continuum Press.

Goodman, S. (2003). *Teaching youth media: A guide to literacy, video production and social change*. New York, NY: Teachers College Press.

Goodman, S. (2018). *It's not about grit: Trauma, inequality, and the power of transformative teaching*. New York, NY: Teachers College Press.

Hagood, M. (2013). So now you know. What are you going to do about it? In J. Ávila & J. Zacher Pandya (Eds.), *Critical literacies as social praxis: Intersections and challenges* (pp. 219–224). New York, NY: Peter Lang.

Harste, J. (2014). The art of learning to be critically literate. *Language Arts*, *92*, 90–102.

Hobbs, R. (2017). *Create to learn: Introduction to digital literacy*. Malden, MA: Wiley Blackwell.

Hobbs, R., & Coiro, J. (2016). Everyone learns from everyone: Collaborative and interdisciplinary professional development in digital literacy. *Journal of Adult and Adolescent Literacy*, *59*(6), 623–629.

Hoechsmann, M., & DeWaard, H. (2015). *Mapping digital literacy policy and practice in the Canadian education landscape*. Ottawa: Media Smarts. Retrieved from http://mediasmarts.ca/teacherresources/digital-literacy-framework/mapping-digital-literacy-policy-practice-canadian-educationlandscape

Hutchison, D. (2012). *The student filmmaker. What works? Research into Practice*. Toronto: Ontario Ministry of Education.

Ito, M., Horst, H. A., Bittanti, M., Boyd, D., Herr-Stevenson, B., & Lange, P. (2008). *White paper. Living and learning with new media: Summary of findings from the digital youth project*. Chicago, IL: The John P. and Catherine T. MacArthur Foundation.

Jenkins, H., Purushotma, R., Weigel, M., Clinton, K., & Robison, A. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. Cambridge, MA: MIT Press.

Johnson, M., Riel, R., & Froese-Germain, B. (2016). *Connected to learn: Teachers' experiences with networked technologies in the classroom*. Ottawa: Media Smarts & The Canadian Teacher's Federation.

Knobel, M., & Kalman, J. (2016). Teacher learning, digital technologies, and new literacies. In M. Knobel & J. Kalman (Eds), *New literacies and teacher learning: Professional development and the digital turn* (pp. 1–20). New York, NY: Peter Lang.

Knoble, M., & Lankshear, C. (2010). *DIY media: Creating, sharing and learning with new media*. New York, NY: Peter Lang.

Kress, G. (2010). *Multimodality: A social semiotic approach to contemporary communication*. New York, NY: Routledge.

Lange, P. (2014). *Kids on YouTube: Technical identities and digital literacies*. Walnut Creek, CA: Left Coast Press.

Lankshear, C., & Knobel, M. (2011). *The new literacies: Everyday practices and social learning* (3rd ed.). Berkshire: McGraw Hill.

Leu, D., Kinzer, C., Coiro, J., Castek, J., & Henry, L. (2013). New literacies: A dual-level theory of the changing nature of literacy, instruction, and assessment. In D. Alvermann, N. Unrau, & R. Ruddell (Eds.), *Theoretical models and processes of reading* (6th ed., pp. 1150–1181). Newark, NJ: International Reading Association.

Leu, D., Forzani, E., Timbrell, N., & Maykel, C. (2015). Seeing the forest, not the trees: Essential technologies for literacy in the primary-grade and upper elementary-grade classroom. *Journal of Adolescent and Adult Literacy*, *69*(2), 139–145.

Lotherington, H., Fisher, S., Jenson, J., & Lindo, L. (2016). Professional development from the inside out: Redesigning learning through collaborative action research. In M. Knobel & J. Kalman (Eds.), *New literacies and teacher learning: Professional development and the digital turn* (pp. 65–87). New York, NY: Peter Lang.

Manjou, F. (2018, February 14). Welcome to the post-text future. *The New York Times*. Retrieved from https://www.nytimes.com/interactive/2018/02/09/technology/the-rise-of-avisual-internet.html

Media Smarts. (2016). *Use, understand & create: A digital literacy framework for Canadian schools, K-12*. Ottawa: MediaSmarts.

Media Smarts. (2018). *Digital and media literacy outcomes by province and territory*. Retrieved from http://mediasmarts.ca/teacher-resources/digital-and-media-literacy-outcomes-province-territory

Miller, S. (2010). Towards a multimodal literacy pedagogy: Digital video composing as 21st century literacy. In P. Albers & J. Sanders (Eds.), *Literacies, art, and multimodality* (pp. 254–281). Urbana-Champaign, IL: National Council of Teachers of English.

Miller, S. (2013). A research metasynthesis on digital video composing in classrooms: An evidence-based framework toward a pedagogy for embodied learning, *Journal of Literacy Research*, *45*(4), 386–430.

Miller, S., & McVee, M. (2012). Multimodal composing: The essential 21st century literacy. In S. Miller & M. McVee (Eds.), *Multimodal composing in classrooms: Learning and teaching for the digital world*. New York, NY: Routledge.

Mills, K. (2010). A review of the 'digital turn' in the new literacy studies. *Review of Educational Research*, *80*(2), 246–271.

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, *66*(1), 60–93.

Ontario Ministry of Education. (2006). *The Ontario curriculum, k-8 language arts*. Toronto: Ontario Ministry of Education.

Ontario Ministry of Education. (2009a). *The Ontario curriculum, grades 1-8 the arts*. Toronto: Ontario Ministry of Education.

Ontario Ministry of Education. (2009b). *Ontario's equity and inclusive education strategy*. Toronto: Ontario Ministry of Education.

Ontario Ministry of Education. (2015). *Literacy for a connected world. Capacity building K-12 monograph*. Toronto: Ontario Ministry of Education.

Ontario Ministry of Education. (2016). *21st century competencies: Foundation document for discussion*. Toronto: Ontario Ministry of Education.

Pink, S. (2007). *Doing visual ethnography* (2nd ed.). Thousand Oaks, CA: Sage

Ratner, E., & Friesem, Y. (2018). Civic media as a cultural dialogue: A professional development journey of Arab and Jewish teachers via documentary filmmaking in Israel. *Journal of Media Literacy*, *65*(1/2), 13–18.

Ratto, M., & Boler, M. (2014). *DIY citizenship: Critical making and social media*. Cambridge, MA: The MIT Press.

Rose, G. (2012). *Visual methodologies: An introduction to researching with visual materials* (3rd ed.). Thousand Oaks, CA: Sage.

Sanford, K., Rogers, T., & Kendrick, M. (2014). An introduction to everyday youth literacies: Critical perspectives in new times. In K. Sanford, T. Rogers, & M. Kendrick (Eds.), *Everyday youth literacies: Critical perspectives for new times* (pp. 1–13). New York, NY: Springer.

Simon, R. (2013). Literacy teacher education as critical inquiry. In C. Kosnik, J. Rowsell, P. Williamson, R. Simon, & C. Beck (Eds.), *Literacy teacher educators: Preparing teachers for a changing world* (pp. 135–148). Rotterdam: Sense Publishers.

Spires, H. (2018). Call for papers. Critical perspectives on digital literacies: Creating a path forward. *Media and Communication*. Retrieved from https://www.cogitatiopress.com/mediaandcommunication

Spires, H, Hervey, L., Morris, G., & Stelpflug, C. (2012). Engergizing project-based inquiry: Middle grade students read, write, and create videos. *Journal of Adolescent and Adult Literacy*, *55*(6), 483–493.

Spires, H., Paul, C., Himes, M., & Yuan, C. (2018). Cross-cultural collaborative inquiry: A collective case study with students from China and the US. *International Journal of Educational Research*, *91*, 28–40.

Steeves, V. (2014). *Young Canadians in a wired world, phase III: Life online*. Ottawa: Media Smarts.

Vasquez, V. (2013). Living and learning critical literacy in the university classroom. In C. Kosnik, J. Rowsell, P. Williamson, R. Simon, & C. Beck (Eds.), *Literacy teacher educators: Preparing teachers for a changing world* (pp. 79–92). Rotterdam: Sense Publishers.

Vasquez, V., & Branigan Felderman, C. (2013). *Technology and critical literacy in early childhood*. New York, NY: Routledge.

Watt, D. (2011a). From the streets of Peshawar to the

cover of Maclean's Magazine: Reading images of Muslim women as 'currere' to interrupt gendered Islamophobia. *Journal of Curriculum Theorizing*, *27*(1), 64–86.

Watt, D. (2011b). *Juxtaposing 'sonare' and 'videre' midst curricular spaces: Negotiating Muslim, female identities in the discursive spaces of schooling and visual media cultures* (Unpublished doctoral dissertation). University of Ottawa, Ottawa, Canada.

Watt, D. (2012). The urgency of visual media literacy in our post-9/11 world: Reading images of Muslim women in the print news media. *Journal of Media Literacy Education*, *4*(1), 32–41.

Watt, D. (2016a). Toward the internationalization of teacher education for social justice: Interrogating our relation to difference in-between *here* and *there*. In S. Sharma & J. Phillion (Eds.), *Internationalizing teacher education for social justice: Theory, research, and practice*. Charlotte, NC: Information Age Publishing.

Watt, D. (2016b). Muslim female students assert their identities in-between family, schooling, and the mass media. *Journal of Family Diversity in Education*, *1*(1), 21–36.

Watt, D. (2017). *New literacies and global education: Video production in teacher education as a critical digital literacy practice*. Paper presented at the world education research association annual meeting, The Education University of Hong Kong, Hong Kong.

Watt, D. (2018). *Video production in teacher education: Negotiating New Literacies practices in-between the classroom and our networked world*. Paper presented at the international conference on education and global studies, Osaka, Japan.

Watt, D., Abdulqadir, K., Hujaleh, H., & Siyad, F. (2019). "Three things you should know about my hijab": The art of youth media activism on YouTube. *Journal of Literacy and Technology*, *20*(1), 252–271.

Watt, D., Abdulqadir, K., Siyad, F., & Hujaleh, H. (2019). Engaging difference in the digital age: Learning with/from three Somali-Canadian, Muslim, female YouTubers. In S. Sharma & A. Lazar (Eds.), *Rethinking 21st century diversity in teacher preparation, K-12 education, and school policy: Theory, research, and practice* (pp. 221–239). New York, NY: Springer Publishing.

Williamson, P. (2013). Introduction. In C. Kosnik, J. Rowsell, P. Williamson, R. Simon, & C. Beck (Eds.), *Literacy teacher educators: Preparing teachers for a changing world* (pp. 1–4). Rotterdam: Sense Publishers.

Willinksy, J. (2001). *After literacy: Essays*. New York, NY: Peter Lang.

Wohlwend, K. (2013). *Liteacy playshop: New literacies, popular media, and play in the early childhood classroom*. New York, NY: Teachers College Columbia University.

About the Author

Diane Watt is an Adjunct Professor in the Faculty of Education at the University of Ottawa. She teaches graduate and undergraduate courses in literacies, digital technologies, curriculum, global education, feminist perspectives, social contexts of education, and qualitative inquiry. Watt has also held positions as a visiting scholar at the Institute for Feminist and Gender Studies at the University of Ottawa, and a Postdoctoral Scholar at the Werklund School of Education at the University of Calgary.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 100–114
DOI: 10.17645/mac.v7i2.1899

Article

Digital Literacy Through Digital Citizenship: Online Civic Participation and Public Opinion Evaluation of Youth Minorities in Southeast Asia

Audrey Yue *, Elmie Nekmat and Annisa R. Beta

Communications and New Media, National University of Singapore, 117416 Singapore; E-Mails: audrey.yue@nus.edu.sg (A.Y.), elmie@nus.edu.sg (E.N.), annisa.beta@nus.edu.sg (A.R.B.)

* Corresponding author

Submitted: 14 December 2018 | Accepted: 19 February 2019 | Published: 11 June 2019

Abstract
The field of critical digital literacy studies has burgeoned in recent years as a result of the increased cultural consumption of digital media as well as the turn to the production of digital media forms. This article extends extant digital literacy studies by focusing on its subfield of digital citizenship. Proposing that digital citizenship is not another dimension or axis of citizenship, but a practice through which civic activities in the various dimensions of citizenship are conducted, this article critically considers how the concept of digital citizenship can furnish further insight into the quality of online civic participation that results in claims to and acts of citizenship. Through interdisciplinary scholarship, drawing from critical media and cultural theory, and media psychology, and deriving new empirical data from qualitative digital ethnography and quantitative focus group and survey studies, it presents original case studies with young people in Southeast Asia, including young Muslim women's groups in Indonesia and youth public opinion on LGBTs in Singapore. It argues that Southeast Asian youth digital citizenship foregrounds civic participation as emergent acts that not only serve to make society a better place, but also enacts alternative publics that characterise new modes of civic-making in more conservative, collectivistic Southeast Asian societies.

Keywords
digital citizenship; digital literacy; Indonesia; online civic participation; Singapore; Southeast Asia

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

This article extends digital literacy through its critical subfield of digital citizenship. Digital literacy studies have burgeoned in recent years consequent of the increased cultural consumption of digital media and the turn to the production of digital media forms. The term can refer in general to individual knowledge about an activity mediated by digital media, as well as in particular to mastery in operation and proficiency in negotiating the affordances of digital platforms. This article extends current scholarship which addresses these competencies in terms of information and skills, to consider how the concept of digital citizenship can furnish new insights into the quality of online civic participation that results in claims to and acts of citizenship.

Digital citizenship is broadly defined as the ability to participate online and as an extension of social inclusion. It is not another dimension or axis of citizenship, but a practice through which civic activities in the various dimensions of citizenship are conducted. It thus refers to the capacity and use of ICTs to plan, organize or conduct activities in the citizenship domains of the social, political, economic and cultural. The Internet may be a space for civic activities and engagement or may simply be a planning tool to enable these activities to oc-

cur. In this article, we theorise digital citizenship as a subfield of digital literacy, and demonstrate this focus by extending the emphasis on online competencies to civic participation. We examine original case studies drawing from empirical fieldwork with young people's use of social networking platforms in Southeast Asia, including the collective organizing of young Muslim women's groups in Indonesia and youth evaluation of public opinion on LGBTs in Singapore. We highlight the formation of civic skills such as how young people recognize, filter and use online information to make decisions about public discourses of homosexuality; how they appropriate gendered forms of public expressions, and; how they support new modes of affiliation with peer networks to create alternate publics and entrepreneurship. We present interdisciplinary scholarship drawing from critical media and cultural theory as well as media psychology, to derive new empirical data from qualitative digital ethnography and focus group studies. This article argues that for young people, ways of engagement in civic life are impacted by, and to some extent, reliant on the Internet and social media. Southeast Asian youth digital citizenship foregrounds civic participation as emergent acts that not only serve to make society a better place, but also enacts alternative publics that characterize new modes of civic-making in more conservative, collectivistic Southeast Asian societies.

2. From Digital Literacy to Digital Citizenship of Youths

The term 'digital literacy' describes the skills and capabilities that are required by individuals to participate in a digitally-enabled society. Gilster (1997) first coined the concept to refer to "the ability to both understand and use digitised information" (p. 2). Central here is Gilster's emphasis on the mastery of ideas rather than technical skills. The former highlights its conceptual definition while the latter draws on its standardized operational definition (Lankshear & Knobel, 2006). Gilster's emphasis on the former draws attention to how digital literacy requires not just socio-cognitive competencies to evaluate, analyze and synthesize information, but that such information can enable individuals to mediate action and engage in the world. It draws attention to literacy not simply as the ability to read and write, but the capacity to understand and shape how information is consumed and presented. This emphasis prompts Lankshear and Knobel (2008) to suggest digital literacy as a *social practice* concerned with making meanings out of texts that are produced, received, distributed, and exchanged via the digital. For them, a social practice is not simply concerned with the way people read texts, but the ways people talk about, use, and encode beliefs and values about them, as well as the ways these texts socially connect them to others in different contexts. The framework of 'digital literacies' is thus more cogent to refer to the multiple ways in which people use and interpret the digital text, as well as the multitude of digital media forms that are constantly evolving.

The expansive view of digital literacies attends to the diverse practices that surround the digital society and their attendant policy implications, as well as their benefits to educational learning. More recently, Luke (2017) draws this field together by encapsulating the debates on digital literacies under the framework of critical literacy. Critical literacy is not just about learning how to critique the government or corporations but knowing "how texts attempt to do things to people and places, how they can be contested and, ultimately, remade in constructive ways that work in the interests of [sic] people and their communities" (2017, p. 11). The author highlights how affordances of digital tools such as multimodality, interactivity, collaboration, intertextuality, and identity construction are significant to fostering critical inquiry. This development resonates with research on the digital divide that has also shifted the focus on material and skills access (i.e., technical competencies) toward mental and usage access (i.e., critical and cultural literacies) (e.g. D'Haenens, Koeman, & Saeys, 2007; van Djik, 2004).

These scholarly developments suggest that digital literacy is a social practice as well as a form of critical literacy. They also share two common features. First, they eschew the focus on learning for technical skills by treating technology and literacy as social practices enshrined in critical inquiry. This emphasis enculturates competencies that allow people to interrogate the relationship between language, technology, and power, and engage in social action and justice. Second, they focus predominantly on literacy education in schools and the competencies of children and young people. This stems from the theoretical influence in new literacy studies and genealogy in educational pedagogy, in particular on the centrality of technology to the lives of digital natives and the capacity of schools to prepare them with resources and skills for meaningful participation.

The current article draws on and extends the abovementioned approaches to social practice and critical literacy in two ways. First, by advancing extant digital literacy studies with the subfield of digital citizenship and, second, by expanding the scope of the school to that of the social world inhabited by these people. The purpose is to critically examine how digital literacy enables young people to participate as civic actors and, in and through these practices, allow them to make claims to citizenship. Citizenship has become a significant site in the current milieu of global mobility, technological disruption and youth precarity. Especially in Southeast Asia where our case studies are located, a region where conservative states and smart city intelligent systems have co-evolved in tandem, digital citizenship is a key arena to identify the capacity of digital multiliteracies to empower young people's rights to participate effectively and belong. This alignment of digital literacy to citizenship is already reflected in current European policy recommendations that call for digital citizenship to be embedded in the school curriculum so young people are not just provided opportunities to design, create, make,

remix and share digital creative content, but also learn the broader issues associated with the ownership of data, privacy, and movement across different media platforms and social networks (McGillivray, McPherson, Jones, & McCandlish, 2016).

Digital citizenship is a relatively new and contested concept. Its meanings and applications vary significantly. The term is situated at the nexus of the pervasiveness of digital technologies in a modern world with the promise of new modes of participation and the threats and risks associated with digital media. There are two contrasting normative approaches to digital citizenship, especially in relation to young people: the *freedom* approach and the *control* approach. The following section critically discusses these approaches and forwards a more productive third approach centered on civic participation.

In the freedom approach, digital citizenship is broadly defined as "the ability to participate online" (Mossberger, Tolbert, & McNeal, 2008, p. 1). This approach draws together issues surrounding access and social inclusion, namely digital participation and inclusion. Here, the view is that online technologies have fundamentally reshaped the meaning and function of citizenship. Where normative understanding of citizenship is distinguished by traditional or analogue citizenship, where communication tended to be linear and one-way (politicians and authorities talk to the public and public either responds or remains silent), digital citizenship assumes multi-layered, open-ended political interactions where individuals find ways to "recognize, contest and negotiate with the powers that exist to control them" (Coleman, 2006, p. 259). Akin to the concept of the netizen as a political subject constituted in cyberspace, this approach carries a transformative potential because of the simultaneous devotion to the nation, to the Internet, and to the cosmopolitan political spaces that cyberspace inaugurates (Poster, 2002).

This approach resonates strongly with young people. Studies show that young people find fewer opportunities and less satisfaction in traditional, formal forms of civic engagement, and that many youths are resorting to finding new ways of practicing citizenship online (Harris, Wyn, & Younes, 2010; Rahim, Pawanteh, & Salman, 2011; Ward, 2013). The contemporary young person is already characterized as a 'networked young citizen,' one who is likely to practice citizenship in digital spaces (Loader, Vromen, & Xenos, 2014). They are more likely to avoid more traditional forms of political or civic organizations in favor of participating in horizontal, non-hierarchical networks, to be project-oriented, reflexive and to engage in lifestyle politics. In other words, young people are practicing citizenship online without conforming to the dutiful model of citizenship and mostly through social media platforms.

The second approach to digital citizenship is the control approach. Here, the young person is constructed as a not-yet-adult within the mainstream society, in need of protection and guidance, and their digital practices of citizenship portrayed as not-yet-citizenship (Bennett, Wells, & Freelon, 2011; Jones & Mitchell, 2016; Livingstone & Helsper, 2007). This framing of young people provides adults with justification for managing youth digital citizenship, evident in current national projects around digital media literacy, such as the Australian Government's (2018) *Digital Citizenship Guide* or the Government of Canada's (2018) *Digital Citizenship Policy Development Guide*. Adults are granted agency to frame what is considered a good digital citizenship and young people are framed as apprentice citizens who need to learn codes of communication. Discussions focus on normative ideas about dutiful citizenship—what should digital citizenship be like, how should digital citizen behave, the necessary discussions around appropriate use of technology, the risks associated with digital media (especially when users are children and young people), and issues of privacy, safety and media literacy (Ribble, 2011). Digital citizenship is thus defined through the norms of appropriate online behaviors, and digital citizenship education is seen as a means to prepare young people into responsible adulthood and civic engagement (McGillivray, McPherson, Jones, & McCandlish, 2016). The emphasis here is on educating digital natives to be a 'good citizen' by teaching them the appropriate codes of good behaviour in the same way that they are taught how to 'behave properly' in social settings.

This approach has been criticized as unbeneficial to the young people it aims to protect because it stresses the greater need to protect them from online risks over their right to participate and be heard. As noted earlier, arguably, their exclusion from formal participation in the public sphere has led them to engage in political discussions and learn about political and social issues in informal and familiar spaces availed to them by the Internet and social media.

This article proposes a third approach that moves beyond the oppositional freedom and control approaches to focus on civic participation. Here, digital citizens are "those who technology frequently, who use technology for for political information to fulfil their civic duty, and at work for economic gain" (Mossberger et al., 2008, p. 2). This understanding of digital citizenship is closely aligned with Bennett et al.'s (2011) understanding of 'actualizing citizenship' that distinguishes between dutiful citizenship (a traditional model of citizenship organized around rights and responsibilities), and 'actualizing citizenship' as a mode of civic engagement characterized by personal engagement with peer networks that source information and organize civic action using social technologies that maximize individual expression (p. 834). While online environments function as sites for learning and practicing various forms of citizenship, 'actualizing citizenship' flourishes in digital networked environments through participatory media that blurs the line between producers and consumers, non-hierarchical and multidirectional sources of creative civic inputs, and user generated content that allows for self-expression and individ-

ualization. As the capacity to practice political and economic citizenship online relies on daily access to digital technologies as well as educational and technological skills, digital citizenship is inseparable from the capacity for wider participation in a society. Here digital citizenship captures not only how people practice citizenship online, but also how these practices interrelate with their offline lives (Bakardjieva, Svensson, & Skoric, 2012; Choi, 2016; Coleman, 2006; Couldry et al., 2014).

This approach considers digital citizenship as a complex assemblage of technical, social, political, legal, and commercial processes that cultivate fragmented, multiple and agonistic digital spaces and digital citizens (McCosker, Vivienne, & Johns, 2016). Here, digital citizenship is defined by "the acts of citizenship" rather than by online participation where the "digital citizen is both a result and an effect of making claims about rights" regardless whether these rights exist or not yet (Isin & Ruppert, 2015, p. 62). This approach challenges dualisms that distinguishes between digital and real worlds, and rights and responsibilities when thinking about citizenship. In this way, the lines between private and public, online and offline, local and global, become blurred while citizenship becomes inseparable from other everyday practices. Digital citizenship is not seen as another dimension or axis of citizenship, but a practice through which civic activities in the various dimensions of citizenship are conducted.

In this article, we demonstrate the third approach to digital citizenship as a subfield of digital literacy focussing on the online practices and acts of citizenship by young people in Southeast Asia, specifically in Singapore and Indonesia. Young people in Asia make up more than 50% of the world's youth population, yet to date, discussions on youth digital citizenship have predominantly focused on the West. This article aims to fill this gap. Additionally, Asia's global lead in terms of the rate of ICT adoption and smart city innovations warrants more scholarship about its young people's technology use in the ambits of digital literacy and citizenship. This article will thus critically show how young people in conservative Southeast Asian societies have carved out new mediated practices that support their right to participate and belong, and discuss its significance in producing new ways of looking at digital literacy.

3. Singapore Case Study: Youth Civic Engagement and the 'Sensing' of Public Opinion on LGBTs

To effectively 'actualize' citizenship and engage in civic action, the young digital citizen needs to display the critical ability to accurately 'sense' the public opinion surrounding socio-political issues debated in society. Digital citizens are no longer passive consumers of proprietary public information but play an active role in negotiating the distribution and evaluation of public opinion surrounding social issues on social media. In this section, we interrogate how ubiquitous media and interpersonal information sources on social media have problematized young users' ability to evaluate public opinion, forcing us to rethink digital literacy as a set of critical literacies that shape their social practice.

As a form of 'public conscience' or a 'group state of mind,' public opinion is broadly defined as a reflection of the majority opinion of an issue at any point in time in a given social context (Allport, 1937; Noelle-Neumann, 1974). *Actual* public opinion, however, differs from *perceived* public opinion. The latter deals with individual socio-cognitions processed at two levels where information and attitudes are internalized (i.e., micro-level processes) by deducing societal norms and public attitudes (i.e., macro-level process; Glynn & Huge, 2008). In this perceptual process, citizens make informed conclusions about what others feel and think about an issue in a less scientific and more imprecise manner by 'quasi-statistically sensing' the issue opinion distributions in society (Noelle-Neumann, 1993; Scheufele & Moy, 2000). Three main indicators influence online opinion deduction: mass media or proprietor content; user-generated comments and opinions, and; aggregated representations of user-content interactions (Neubaum & Krämer, 2017).

To address cognitive demands needed to assess online public opinion, individuals select informational sources consistent with what they believe others in society are feeling (Stroud, 2008), and heuristically make judgments about what they *perceive* is the public sentiment (Walther & Jang, 2012) and how *credible* these group-based sentiments are (Metzger, Flanagin, & Medders, 2010). This is especially challenging for young people who also need to confront polarized 'echo chambers' (Schulz & Roessler, 2012; Sunstein, 2001) and multiple layers of opinion climate indicators (i.e., offline–online, internet–forum) (Nekmat & Gonzenbach, 2012; Yun & Park, 2011) in social media. Our findings below demonstrate how critical literacy and social practice are needed to nurture an informed digital citizenry capable of assessing online public opinion.

3.1. Method

Ten focus group discussions with Singaporean youths were conducted to examine how users evaluate and utilize mass media and interpersonal information cues on social media to gauge the public opinion on LGBTs in Singapore. In the context of Singapore, homosexuality is sanctioned by Section 377A of the Penal Code and LGBT-related issues tend to take media center stage when debates surrounding LGBT policies and events related to LGBT communities and activism take place in the country (see, e.g., Ho, Chen, & Sim, 2013). These groups enabled the study to better uncover the interconnected opinion-formation processes, range of consensus, and diversity of viewpoints *among* ideologically-similar user groups, in order to analyze their ideological group similarities and differences (Donsbach & Traugott, 2008). The relia-

bility of this process is heightened as we take a peripheral and facilitative role in the group discussions as compared to a more central 'interrogative' position in one-to-one interviews (Nyumba, Wilson, Derrick, & Mukherjee, 2018). Additionally, grouping users according to similar attitudes on a morally-loaded and contentious issue in Singapore's context reduces their fear of being socially ostracized for expressing minority opinions during group discussions. Instead, it produces more in-depth findings on the opinion formation process by making participants more willing to link group discussions with their personal issue positions and experiences.

3.2. Focus Group Procedure

A pre-study survey measured participants' attitudinal position toward homosexual communities and lifestyles on a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree) according to six statements that included, homosexuality is perfectly acceptable, laws regulating homosexuality should be loosened, and people should accept homosexuals as part of society (e.g., Morrison & Morrison, 2002). Participants were then grouped according to similar attitudes on LGBTs—supportive ($M > 4.01$) and unsupportive ($M < 3.99$). Overall, 46 participants—of which 24 participants supportive toward LGBTs and 22 participants unsupportive toward LGBTs—participated in the focus groups. Of these, 22 were males, 24 were females, 34 were full-time students between the ages of 21 to 24, and 12 were between the ages of 23 and 30 years and working full-time. Five focus group sessions comprised participants who held supportive attitudes and the other five focus groups consisted of participants unsupportive of LGBTs. Each focus group discussion lasted between 50 to 65 minutes on average and comprised four to six participants each.

3.3. Data Analysis and Findings

All sessions were audio-recorded for data analysis purposes with anonymity ensured by the de-identification of participants in the verbatim transcription process. The constant comparison method for categorization of data via frequency, specificity, extensiveness, and similarity (e.g., Krueger & Casey, 2000) followed by selective coding to develop themes in each grouped category was carried out to analyze and interpret findings (see Table 1 in Appendix for an overview of the analytical framework and themes guiding the focus group discussions and data analysis).

3.4. Dependency on Interpersonal Cues for Opinion Climate Formation

Overall, participants were able to clearly differentiate between informational cues from mass media and user-generated comments in social media; citing differences in the roles of the two types of cues to affect their evaluation of the public opinion on LGBTs. In this regard, greater dependence on interpersonal sources of information as cues affecting users' perception of the opinion climate on the issue was found, as evidenced by a respondent's frustration when s(he) claimed "I hate it when they [news sources] disable comments because in that way, you can't really read what people are saying" (respondent 41). At a greater level of interpersonal cues dependency, respondents would rely solely on user comments and reactions in social media to assess majority opinion on the issue. This reliance can be attributed to the way information is displayed on social networking sites such as Facebook, where highly visible aggregation of popular user comments and reactions (i.e., number of Likes, Shares) attract users to read other users' reactions as a "proxy for public opinion," which could ultimately shape "participants' beliefs about what other members of the society think" (Lee, 2012, p. 41). To an even greater extent, several respondents mentioned not being able to determine the public opinion on the issue in the absence of such interpersonal opinion cues in social media. These findings echo prior studies that suggest the influence of interpersonal sources of information to veritably outweigh the effect of mass media on one's perception of public opinion (De Vreese & Boomgaarden, 2006; Watts & Dodds, 2007), and that a shift in the locus of power and message control from the media to the people is evident on social media (Glynn, Herbst, Shapiro, Lindeman, & O'Keefe, 2015).

3.5. Juxtaposition of Mass Media and Social Information Cues: Source Ordering and Layering

Participants, ultimately, juxtapose mass media and social information cues against one another to gauge public opinion on social media via two general processes: source *ordering* and *layering*. The sequence in which users noticed the two sources of information and the immediate perception derived from a particular informational source—either from the news proprietor or friend—influences their processing of the information and, consequently, the perception of majority opinion on the issue. Consistent with the two-step flow hypothesis (e.g., Katz & Lazarsfeld, 1955), participants generally encounter social informational cues before mass media content, and that most of the media content they encounter on social media were "usually what [their] friends share[d]" (respondent 8). Seeing social informational cues first provides a "halo effect" upon the proprietor information that follows (Nisbett & Wilson, 1977), which stimulated increased attention to the media content. Mass media content were then referred mainly to inform participants on why others are interested in this issue or why they should pay attention to it.

Respondents described how attention was given to news reports and other user comments "only when they appear interesting enough or has a lot of likes and shares" (respondent 7). Such numerical aggregations of popu-

larity, and plausibly importance, such as likes, shares, and top comments, bestows an "endorsement heuristic" (Metzger et al., 2010), which lead to the impression that one should believe and pay attention to the media content or user comment because many others have done likewise. As exemplified by respondent 2, "cause[sic] of the number of likes. Like I would be wow(!) So many likes ah [sic], this definitely must see or important." It was further noted that when users perceived greater significance of the information from social cues that they had seen first, mass media content were referenced for their 'titles' and 'interesting headlines' as respondents felt online comments to be sufficient indicators, or 'exemplars,' of public sentiments on social issues (Zillman & Brosius, 2012). As iterated by respondent 17:

> If you want to know how Singaporeans think—that's generally reflected on the comments section of the news piece shared online. Like when *The Straits Times* posts something...you get a general sensing of how people feel about the topic by reading their comments more than the news article.[1]

The first exposure order of user comments was also found to create social informational reliance for opinion climate perception, bypassing the media information that was shared but layering with other interpersonal cues. So, basically, the attentional order became interpersonal cue A → interpersonal cue B, instead of interpersonal cue A → media cue A. On top of this, the use of endorsement heuristics, as discussed earlier, were then utilized to evaluate the relevance of interpersonal cue B in perceiving the opinion climate on the issue. As shared by respondent 39:

> I will actually just scroll down to the comments—I won't look for or actively read the articles my friends post related to LGBTs but I am interested in their comments. In the comments sometimes there'll be really long posts and people will put the "sad" or "angry" face and some people who will reply "you should just go and live somewhere else" that kind of thing….Yeah, so I get the idea of what people agree on.

These findings illuminate the subversion of the mass media's role as agenda-setters in the formation of public opinion in social media. That said, as a second order information, mass media sources acted to confirm users' perceptions of the opinion climate and helped participants also navigate and make sense of the multiple social informational cues online. As mentioned by respondent 21:

> The news and videos that they share on the Pink Dot tell me about what Singaporeans think....It made me think whether a lot of other Singaporeans also becoming more open (to homosexuality), because it seems like my friends on social media also feel that way.[2]

3.6. Trans-Border Mass-Interpersonal Blending of Informational Cues

Notably, findings further suggest a trans-bordered mass-interpersonal blending of foreign media with user comments as users contextualize cues from social sources to situate and interpret foreign news reports to local context to gauge the opinion climate on the issue. As shared by respondent 19:

> Facebook shows news from other countries, and other countries have movements that are more open to LGBT people like the UK has this pride day and the US has something similar, so when my friends on Facebook see this sort of news, they will think like 'yeah, these countries are much more supportive and open than Singapore' and that's why maybe (Singaporean) teens nowadays are more open [on LGBT].

The issue in foreign countries as reported in foreign media then stems as a point of reference used to contrast and reinforce their prevailing and local opinion climate perception. As highlighted by respondent 4 who perceived majority Singaporeans to be conservative:

> When you compare like what was reported in the BBC or even in Buzzfeed of how the people in USA or Europe are increasingly becoming more open to homosexuality…to the point of legalizing marriage between two men or women or whatever…then you see a lot of Singaporeans on Facebook, Twitter challenging (the news) makes you feel that it is a lost case.

3.7. Social Identity-Based Opinion Climate Evaluation

Users were also found to engage in social identity-based, cognitive contrast processing (Tajfel & Turner, 2004) when blending and evaluating the two informational indicators to gauge public opinion on social media. In this process, user's ideological positioning due to his or her perceived group membership was found to influence their selection of evidence and groups to compare with in bid to defend their perceived membership to ideological in-groups and reaffirm their preconceived attitudes. Such cognitive processes were implicated in how users evaluate and blend mass-interpersonal sources, further showing evidence of extreme hostile exemplars utilized among respondents in both LGBT-supportive and non-supportive groups. Respondent 31, for instance, declared how s(he) would disregard information from recognized opinion leaders and sources who are non-supportive toward LGBTs by mentioning how s(he) particularly disliked "Lawrence Kong….He's the pastor that

[1] *The Straits Times* is the leading government-owned national newspaper in the country.
[2] Pink Dot is Singapore's annual LGBT Pride Day held at Hong Lim Park. Attendees wear pink to show their solidarity and support.

started the White Shirt movement and openly bashes gay people".[3]

On the flipside, respondents who were non-supportive of LGBTs mentioned how they would discount the news and opinions of users supporting 'the Wear White movement,' a movement initiated by religious groups in Singapore mainly from the Muslim and Christian communities and "wouldn't read their stuff" (respondent 16) if they were to show up in their social media feed." Such 'othering' of information from ideologically-dissonant groups are hostile exemplars of public opinion, and its contrast processing can be seen to encourage polarized ingroup-outgroup opinion climate perceptions.

3.8. Summary

This case study shows how social media in a conservative environment like Singapore has enabled young people to acquire information and form public opinion in decentralized ways, including negotiating the global flows of information as well as through shared peer information. Information is evaluated and valued in ways that resonate with users' ideologies produced by their life worlds and experiences. As digital citizens, they play an active role in negotiating the distribution of issue opinions on social media, and often evaluate mainstream media's indications of public opinion through peer user's perspectives and experiences. Young people form online public opinion and perform digital citizenship through these critical literacies that allow them to discern information constructively based on social identities that can potentially subvert the role of mass media as agenda-setters. The influence of peer information also illuminates digital citizenship as a social practice in digital literacy that allows users to reflect and act on the world around them, sometimes in ways that challenge mainstream ideologies.

4. Indonesia Case Study: Young Muslim Women's Groups

The number of Internet users in Indonesia has grown rapidly from only 2 million in 2000 to 143 million in 2017. Eighty-seven percent of the users are on social media (Yuniarni, 2018), and 30 million Internet users are children and teenagers (Gayatri et al., 2015). Following this ascendency, young Muslim women started gaining visibility as 'Internet celebrities' (Abidin, 2016). Notably, they began to be more present in public discussions as they create and participate in informal social-media-based young Muslim women's groups. This section focuses on these young Muslim women's groups as representatives of female youth digital citizenship, and with the potential to create alternative publics in the usually male-dominated public cultures. While their male counterpart gained public attention for joining conservative Islamist groups and doing 'street politics' (Hasan, 2015), young Muslim women practise 'quiet' acts of citizenship, seemingly revolved only around mundane social practices. However, as this section will demonstrate, young women's digital literacies allow them to engage peers and garner political potential to participate in civic activities.

This section reports on an analysis of six popular young Muslim women's groups: Dunia Jilbab (DJ), Ukhti Sally (US), Peduli Jilbab (PJ), Hijabers Community (HC), Jogjakarta Muslimahpreneur (JMP), and Tasikmalaya Hijabers (TH). These groups have more than a million social-media followers combined. They are chosen because they represented the mushrooming of informal collectives organized by young Muslim women facilitated by the increasing access to the Internet and mobile phones. Started between 2010–2015, all the groups' founders were friends looking for a sense of community and expanded initially through young Muslim women peer networks. The groups had distinct characteristics, and some were critical of the others' interpretation of Islamic virtues. All of them, however, were committed to promoting their version of pious subjectivity (Mahmood, 2005) based on their interpretations of Islamic teachings for young Muslim women in Indonesia.

4.1. Method

This section draws data collected using the 'ethnography for the internet' approach (Hine, 2019). The Internet is understood here as multi-spatial, engaging users in different locations, temporalities, and mobility. Thus, the groups studied here are seen as the 'field' itself, requiring the ethnographer to follow their flexibility in using different platforms, locations, and tools online and offline. Specifically, it reports on the social media observation, participant observations of the groups' gatherings, and interviews with group members. Social media observation of the groups' accounts on Instagram was conducted from June 2015 to June 2016 and October 2016 to April 2017. Data collection also included participant observations of 24 offline gatherings organized by the young Muslim women's groups and unstructured interviews with 21 young Muslim women, including the organizers, followers, and lurkers of the groups.

The data was treated as a set of discourses or "a corpus of statements" (Kendall & Wickham, 1999, p. 42) analysed using Foucauldian Discourse Analysis or FDA (Kendall & Wickham, 1999; Worthman & Troiano, 2016). FDA investigates: (1) the rules of production of the statements; (2) the rules that determine the borders of the sayable and the visible; (3) the rules that allow the production of new statements, and; (4) the rules that ensure a social practice is material and discursive at the same time. The analysis below focuses on how young women's pious subjectivity is constructed through the discourses circulating online (social media accounts) and offline

[3] The Wear White movement is a multi-faith anti-LGBT coalition group in Singapore. Attendees wear white on the day of the Pink Dot celebration and gather around Hong Lim Park to protest LGBT pride.

(gatherings) (see Table 2 in Appendix for an overview of the young Muslim women's groups studied, their social media following, and the themes emerging from the analysis of their social media accounts).

4.2. Findings: Three Discourses on Young Muslim Women's Digital Citizenship

The analysis, following FDA, examines the ways discourses surrounding young Muslim women as digital citizens are constructed in their social media posts, their gatherings, and the interviews. The following paragraph explains three distinct discourses emerging in the analysis: (1) young Muslim women as feminine, pious, and obedient; (2) young Muslim women as ethical entrepreneurs; and (3) political young Muslim women. Before discussing these, it is necessary to briefly contextualise Indonesia's socio-political context that lays the foundation of the production of these discourses.

Indonesia was under an authoritarian regime called the New Order led by President Suharto for 32 years from 1966 to 1998. The regime eliminated any form of opposition to its patriarchal developmentalist project of state-building. Women's organizations critical of the regime were banned, and women's political expressions were framed as dangerous. The regime installed a new state programme called Guidance of Family Welfare (PKK) which located women's citizenship only in domestic sphere and in their obedience to their husbands, families, and the state (Suryakusuma, 2011; Wieringa, 2002). After the regime fell two decades ago, Islamic political power became increasingly influential, marking a conservative turn (Hasan, 2009; van Bruinessen, 2013). Despite freedom from authoritarian regime, traces of the New Order sexual politics remained and are now reconfigured by the increasingly pious public (Wieringa, 2009, 2015), creating a path of women's citizenship that now involves piety, as analysed below. In particular, they show how social media use help these groups cultivate pious subjectivity as part of everyday self-representation which allows the young Muslim women to make citizenship claims in the domains of the social, cultural, and economic.

4.3. Young Muslim Women as Feminine, Pious, and Obedient

One similarity across the groups' Instagram accounts show they deploy tropes based on the young Muslim women's piety and obedience to religious values. This is visually represented as stereotypically feminine, soft, and sweet on their posts. A sample of Instagram posts by PJ, DJ, US, TH, and HC on February 7, 2016, for instance, reveals these tropes (see Figure 1).

Although the posts are on different topics, they share similar visual language. TH and HC's posts are event announcements. TH's post (a) has a solid bright pink background announcing an event titled 'Becoming an Independent Muslimah,' which promotes Muslim women's entrepreneurship. HC's post (b) announces the 'Inspiring Love Stories'. PJ's post (c) promotes an event the group was organizing on the Valentine's Day 2016. US' post (d) is on the theme of love and relationship, particularly marriage proposal. The last image (e) is DJ's post on religious commentary, specifically the issue of *istiqomah* (the quality of being steadfast in one's faith) while donning the veil.

The posts demonstrate the imaginary of the ideal Muslim womanhood and the groups' strategies to maintain their following. With religious commentaries, discussions on veiling, love and relationship, and event invitations, these posts are important for their followers. One participant of HC's gathering, a fresh graduate, said: "It was difficult for me to find religious gatherings for young women. What [HC] discusses are interesting, and I get to meet women my age." Similarly, two university students claimed that they joined DJ to be able to meet "people with the same story." In other words, the young women are looking for a community that could help them learn about Islamic teachings with their peers. Digital citizenship is evident in the social practice of Instagram, first through pious female self-representation, and second, its attendant creation of online and offline communities.

4.4. Young Muslim Women as Ethical Entrepreneurs

These groups also use their social media accounts to promote entrepreneurship that does not focus only for economic gain. As one of the groups' chairwomen affirmed in an interview, it was important followers were interested in becoming entrepreneurs, specifically in *dakwah* (prosetylization) business (Nisa, 2018)—a kind of business that is based on promoting Islamic teachings and modesty. Two reasons support this emphasis. One is the story of the early lives of Prophet Muhammad and his wife, Khadijah, as merchants. This story had been used in different Islamic movement to encourage Muslims to become entrepreneurs (Hoesterey, 2016). Two is the economic liberalization of Indonesia in combination with the rise of Internet economy in the Southeast Asia region (Google & Temasek, 2017). In an interview in 2015, the chairperson of HC described she wanted HC to facilitate its members in improving themselves as good young Muslim women (by learning about Islamic virtuous behaviours) and in becoming productive (by organizing events that encouraged the members to be entrepreneurs). Similarly, the founder of JMP admitted that the group was created specifically to help fellow young Muslim women learn to build businesses from each other. The groups organized gatherings to teach the principles of ethical entrepreneurialism, how to build brands, and how to make use of online tools. The groups also maintain that a young woman's economic independence does not mean she forgets her religious obligations as a good (future) wife and mother. Digital citizenship is evident in the social practice of multiliteracies—cultural,

(a)

(b)

(c)

(d)

(e)

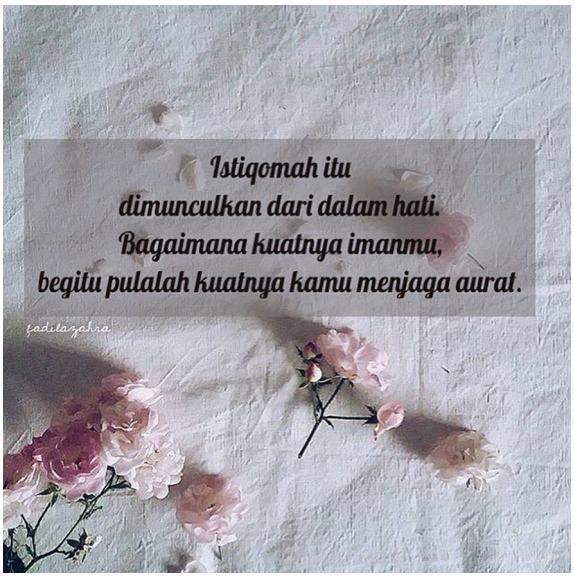


Figure 1. A set of images from the Instagram accounts of (a) Tasikmalaya Hijabers (TH), (b) Hijabers Community (HC), (c) Peduli Jilbab (PJ), (d) Ukhti Sally (US), and (e) Dunia Jilbab (DJ), posted on 7 February 2016.

social, economic—as young Muslim women gain better economic status while also cultivate their piety.

4.5. Political Young Muslim Women

These groups materialise digital citizenship as a social practice by creating alternative publics for civic activities. Evident is how the groups' consistent promotion of pious subjectivity has shaped the political leanings of the organizers and followers. The event of 2017 gubernatorial election in Jakarta, Indonesia's capital, is exemplary. The election had the incumbent, Basuki Purnama, in a tight race with another candidate, Anies Baswedan. Before the election began, Purnama, who is a Chinese-Indonesian and Christian—making him a double minority in Indonesia—was accused of religious blasphemy, a criminal offence under Indonesian law. Purnama's religious blasphemy case was made more intense as the Islamist groups organized rallies and protests against him in late 2016, called the '411' (4 November 2016) and '212' (2 December 2016). Reacting to the event, the groups use hashtag activism to actively promote #belaquran (defend the Quran) to support the '411' and '212' rallies. One of the groups, for instance, use terms such as '*aksi*' (action), 'people power', '*supremasi hukum*' (rule of law), and '*keadilan*' (justice). During the election, they also use #muslimvotemuslim—alluding to the fact that Purnama is a Christian and therefore not worthy of their followers' votes. Although political discussion very rarely appear on their Instagram feed, it could be argued that their consistency in promoting Islamic teachings and cultivating their followers' piety serve to ground their political leaning. Through hashtag activism, the space they carve online and offline allows them to create alternative expressions of civic concerns.

4.6. Summary

This section illustrates how digital citizenship can manifest in different forms. As gender and religious identities mark the political positioning of young Muslim women in Indonesia, we should therefore see that digital citizenship does not always require civic engagement as it is conservatively understood (participation in public debates or consistent claim-making in pursuit of social change). Rather, everyday self-representations on social media platforms *condition* the participation of young Muslim women as digital citizens, including their rise as female entrepreneurs and political actants.

5. Conclusion

This article has examined digital citizenship as a subfield of digital literacy research. It has drawn on digital literacy's features of critical literacy and social practice to highlight how digital citizenship is actualized through online engagement that results in civic participation. Further demonstrating digital citizenship through original empirical case studies with young people in Singapore and Indonesia, this article has de-Westernized digital literacy studies and elucidated Southeast Asian youth digital citizenship as a new mode of civic-making in conservative societies with high media and state controls.

In Singapore, social media such as Facebook has enabled young people to acquire information and form public opinion in decentralized and informal ways. They formed their perception of public opinion on LGBTs by drawing on global and social sources of information. Through sensing and sense-making, they evince a socially and critically literate practice of valuing and trusting information based not solely on state's agenda-setting, but in ways that resonated with the ideologies produced by their own life worlds and experiences.

In Indonesia where the political positioning of young Muslim women is shaped by gender and religious norms, digital citizenship is manifested in quotidian practices on Instagram through the everyday online self-presentation of a feminine and obedient form of pious subjectivity, and its attendant creation of online and offline communities that have also supported new female collectivities and entrepreneurship and women as political agents in the creation of alternate publics. Rather than engage the spectacle of activism and advocacy, these quiet acts of citizenship have also become influential to civic change.

Both case studies share similarities and differences. They show the ubiquity of social media platforms such as Facebook and Instagram to evince diverse creative civic inputs, ranging from the formation and reformation of public opinions, individual and group identities, and activism and commerce. These civic participations materialize the actioning of critical literacies into social practice: in Singapore, the ability to form public opinion by acquiring, blending, juxtaposing and decoding diverse information from multiple sources and via groups with shared and opposing values and identities; in Indonesia, the public visibility of women through self-representation and social expression via religion, politics and business. These practices, while collective in their public voices, further demonstrate civic participation as singular acts of individuations produced by convergent media and peer platforms. Central to both case studies is not just the spectrum of online participation, but how online participation is enculturated in embodiments that are physical, socio-cognitive and corporeal. It is through these embodied modes that literacy as the civic of citizen and city takes its optimal form as a mode of acting in and on the world.

Acknowledgments

The authors would like to acknowledge Rachel Goh Wen Li, Tamara Borovica, Gilbert Caluya and Wilson Koh Wee Kim for their intellectual contribution and research assistance. Early research for the conceptual framing of this article was funded through a grant from the Centre for Multicultural Youth in Melbourne, Australia.

Conflict of Interests

The authors declare no conflict of interests.

References

Abidin, C. (2016). Aren't these just young, rich women doing vain things online? Influencer selfies as subversive frivolity. *Social Media+Society*, *2*(2), 1–17.

Allport, F. H. (1937). Toward a science of public opinion. *Public Opinion Quarterly*, *1*(1), 7–23.

Australian Government. (2018). Digital citizenship. *Office of the eSafety Commissioner*. Retrieved from https://www.esafety.gov.au/education-resources/classroom-resources/digital-citizenship

Bakardjieva, M., Svensson, J., & Skoric, M. (2012). Digital citizenship and activism: Questions of power and participation online. *Journal of Edemocracy & Open Government*, *4*(1), i–v.

Bennett, W. L., Wells, C., & Freelon, D. (2011). Communicating civic engagement: Contrasting models of citizenship in the youth web sphere. *Journal of Communication*, *61*(5), 835–856.

Choi, M. (2016). A concept analysis of digital citizenship for democratic citizenship education in the Internet age. *Theory & Research in Social Education*, *44*(4), 565–607.

Coleman, S. (2006). Digital voices and analogue citizenship: Bridging the gap between young people and the democratic process. *Public Policy Research*, *13*(4), 257–261.

Couldry, N., Stephansen, H., Fotopoulou, A., MacDonald, R., Clark, W., & Dickens, L. (2014). Digital citizenship? Narrative exchange and the changing terms of civic culture. *Citizenship Studies*, *18*(6/7), 615–629.

D'Haenens, L., Koeman, J., & Saeys, F. (2007). Digital citizenship among ethnic minority youths in the Netherlands and Flanders. *New Media & Society*, *9*(2), 278–299.

De Vreese, C. H., & Boomgaarden, H. G. (2006). Media message flows and interpersonal communication. *Communication Research*, *33*(1), 19–37.

Donsbach, W., & Traugott, M. (2008). *Handbook of public opinion research*. Thousand Oaks, CA: SAGE.

Gayatri, G., Rusadi, U., Meiningsih, S., Mahmudah, D., Sari, D., Kautsarina, K., & Nugroho, A. C. (2015). Digital citizenship safety among children and adolescents in Indonesia. *Jurnal Penelitian dan Pengembangan Komunikasi dan Informatika*, *6*(1), 1–18.

Gilster, P. (1997). *Digital literacy*. New York, NY: Wiley Computer Pub.

Glynn, C. J., & Huge, M. E. (2008). Public opinion. In *The international encyclopedia of communication* (pp. 1–7). https://doi.org/10.1002/9781405186407

Glynn, C. J., Herbst, S., Shapiro, R. Y., Lindeman, M., & O'Keefe, G. L. (2015). *Public opinion* (3rd ed.). Boulder, CO: Westview Press.

Google, & Temasek. (2017). *e-Conomy SEA Spotlight*. Retrieved from http://www.temasek.com.sg/Documents/userfiles/files/e-Conomy%20SEA%20Spotlight%202017%20Full%20Report.pdf

Government of Canada. (2018). *Digital citizenship: Guide for parents*. Retrieved from https://www.getcybersafe.gc.ca/cnt/rsrcs/cmpgns/cmpgn-06/gd-prnts-en.aspx

Harris, A., Wyn, J., & Younes, S. (2010). Beyond apathetic or activist youth: 'Ordinary' young people and contemporary forms of participation. *Young: Nordic Journal of Youth Research*, *18*(1), 9–32.

Hasan, N. (2009). The making of public Islam: Piety, agency and commodification on the landscape of the Indonesian public sphere. *Contemporary Islam*, *3*(3), 229–250.

Hasan, N. (2015). Violent activism, Islamist ideology, and the Conquest of public space among youth in Indonesia. In K. Robinson (Ed.), *Youth identities and social transformations in modern Indonesia* (pp. 200–217). Leiden: Brill.

Hine, C. (2015). *Ethnography for the Internet: Embedded, embodied and everyday*. New York and London: Bloomsbury Academic.

Ho, S. S., Chen, V. H. H., & Sim, C. C. (2013). The spiral of silence: Examining how cultural predispositions, news attention, and opinion congruency relate to opinion expression. *Asian Journal of Communication*, *23*(2), 113–134.

Hoesterey, J. B. (2016). *Rebranding Islam: Piety, prosperity, and a self-help guru*. Redwood City, CA: Stanford University Press.

Isin, E., & Ruppert, E. (2015). *Being digital citizens*. London: Rowman & Littlefield International.

Jones, L. M., & Mitchell, K. J. (2016). Defining and measuring youth digital citizenship. *New Media & Society*, *18*(9), 2063–2079.

Katz, E., & Lazarsfeld, P. F. (1955). *Personal influence: The part played by people in the flow of mass communications*. Glencoe, IL: Free Press.

Kendall, G., & Wickham, G. (1999). *Using Foucault's methods*. London: SAGE.

Krueger, R. A., & Casey, M. A. (2000). *Focus groups: A practical guide for applied researchers* (3rd ed.). Thousand Oaks, CA: Sage.

Lankshear, C., & Knobel, M. (2006). Digital literacies: Policy, pedagogy and research considerations for education. *Digital Kompetence: Nordic Journal of Digital Literacy*, *1*(1), 12–25.

Lankshear, C., & Knobel, M. (2008). *Digital literacies: Concepts, policies and practices*. New York, NY: Peter Lang.

Lee, E. (2012). That's not the way it is: How user-generated comments on the news affect perceived media bias. *Journal of Computer-Mediated Communication*, *18*(1), 32–45.

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New Media & Society*, *9*(4), 671–696.

Loader, B. D., Vromen, A., & Xenos, M. A. (2014). The networked young citizen: Social media, political participation and civic engagement. *Information, Communication & Society*, *17*(2), 143–150.

Luke, A. (2017). Critical literacy, school improvement, and the four resources model. In P. Albers (Ed.), *Global conversations in literacy research: Digital and critical literacies* (pp. 1–13). New York, NY: Routledge.

Mahmood, S. (2005). *Politics of piety: The Islamic revival and the feminist subject*. Princeton, NJ: Princeton University Press.

McCosker, A., Vivienne, S., & Johns, A. (2016). Digital citizenship as fluid interface: Between control, contest and culture. In A. McCosker, S. Vivienne, & A. Johns (Eds.), *Negotiating digital citizenship* (pp. 1–18). London: Rowman & Littlefield International.

McGillivray, D., McPherson, G., Jones, J., & McCandlish, A. (2016). Young people, digital media making and critical digital citizenship. *Leisure Studies*, *35*(6), 724–738.

Metzger, M., Flanagin, A., & Medders, R. (2010). Social and heuristic approaches to credibility evaluation online. *Journal of Communication*, *60*(3), 413–439.

Morrison, M. A., & Morrison, T. G. (2003). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *Journal of Homosexuality*, *43*(2), 15–37.

Mossberger, K., Tolbert, C. J., & McNeal, R. S. (2008). *Digital citizenship: The internet, society, and participation*. Cambridge, MA: MIT Press.

Nekmat, E., & Gonzenbach, W. (2013). Multiple opinion climates in online forums: Role of website source reference and within-forum opinion congruency. *Journalism & Mass Communication Quarterly*, *90*(4), 736–756.

Neubaum, G., & Krämer, N. C. (2017). Opinion climates in social media: Blending mass and interpersonal communication. *Human Communication Research*, *43*(4), 464–476.

Nisa, E. F. (2018). Creative and lucrative Da□wa: The visual culture of Instagram amongst female muslim youth in Indonesia. *Asiascape: Digital Asia*, *5*, 1–32.

Nisbett, R., & Wilson, T. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*(3), 231–259.

Noelle-Neumann, E. (1974). The spiral of silence: A theory of public opinion. *Journal of Communication*, *24*(2), 43–51.

Noelle-Neumann, E. (1993). *The spiral of silence* (2nd ed.). Chicago, IL: University of Chicago Press.

Nyumba, T. O., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*, *9*(1), 20–32.

Poster, M. (2002). Digital networks and citizenship. *PMLA*, *117*(1), 98–103.

Rahim, S. A., Pawanteh, L., & Salman, A. (2011). Digital inclusion: The way forward for equality in a multiethnic society. *Innovation Journal*, *16*(3), 1–12.

Ribble, M. (2011). *Digital citizenship in schools*. Eugene, OR: International Society for Technology in Education.

Scheufele, D. A., & Moy, P. (2000). Twenty-five years of the spiral of silence: A conceptual review and empirical outlook. *International Journal of Public Opinion Research*, *12*(1), 3–28.

Schulz, A., & Roessler, P. (2012). The spiral of silence and the Internet: Selection of online content and the perception of the public opinion climate in computer-mediated communication environments. *International Journal of Public Opinion Research*, *24*(3), 346–367.

Stroud, N. J. (2008). Media use and political predispositions: Revisiting the concept of selective exposure. *Political Behavior*, *30*(3), 341–366.

Sunstein, C. (2001). *Echo chambers*. Princeton, NJ: Princeton University Press.

Suryakusuma, J. (2011). *State Ibuism: Appropriating and distorting womanhood in New Order Indonesia*. Depok: Komunitas Bambu.

Tajfel, H., & Turner, J. C. (2004). *The social identity theory of intergroup behavior*. New York, NY: Psychology Press.

Van Bruinessen, M. (2013). Introduction: Contemporary developments in Indonesian Islam and the "conservative turn" of the early twenty-first century. In M. van Bruinessen (Ed.), *Contemporary developments in Indonesian Islam: Explaining the "conservative turn"* (pp. 1–20). Singapore: Institute of Southeast Asian Studies.

van Dijk, J. (2004). Divides in succession: Possession, skills, and use of new media for societal participation. In E. P. Bucy & J. E. Newhagen (Eds.), *Media access: Social and psychological dimensions of new technology use* (pp. 233–254). Mahwah, NJ: Lawrence Erlbaum.

Walther, J. B., & Jang, J. (2012). Communication processes in participatory websites. *Journal of Computer-Mediated Communication*, *18*(1), 2–15.

Ward, J. (2013). Youth and websites: Exploring how young people use the internet for political participation. In R. Scullion, R. Gerodimos, D. Jackson, & D. Lilleker (Eds.), *The media, political participation and empowerment* (pp. 192–204). London: Routledge.

Watts, D. J., & Dodds, P. S. (2007). Influentials, networks, and public opinion formation. *Journal of Consumer Research*, *34*(4), 441–458.

Wieringa, S. E. (2002). *Sexual politics in Indonesia*. London: Palgrave Macmillan UK.

Wieringa, S. E. (2009). Women resisting creeping islamic fundamentalism in Indonesia. *Asian Journal of Women's Studies*, *15*(4), 30–56.

Wieringa, S. E. (2015). Gender harmony and the happy family: Islam, gender and sexuality in post-Reformasi

Indonesia. *South East Asia Research*, *23*(1), 27–44.
Worthman, C., & Troiano, B. (2016). A good student subject: A Foucauldian discourse analysis of an adolescent writer negotiating subject positions. *Critical Studies in Education*, *1*(3), 1–18.
Yun, G. W., & Park, S.-Y. (2011). Selective posting: Willingness to post a message online. *Journal of Computer-Mediated Communication*, *16*(2), 201–227.
Yuniarni, S. (2018, February 19). Indonesia dad 143m Internet users in 2017: APJII. *Jakarta Globe*. Retrieved from https://jakartaglobe.id/business/indonesia-143m-internet-users-2017-apjii
Zillmann, D., & Brosius, H. (2000). *Exemplification in communication: The influence of case reports on the perception of issues*. New York, NY: Routledge.

About the Authors

Audrey Yue is Professor of Media, Culture and Critical Theory, and Head of Communications and New Media at the National University of Singapore. She researches on Asian media cultures, cultural policy and sexuality studies.

Elmie Nekmat is Assistant Professor of Communications and New Media at the National University of Singapore. He researches media effects, focused on the social psychology of computer-mediated communication in public opinion formation and expression, collective action, strategic communication, and digital credibility evaluation.

Annisa R. Beta is a Postdoctoral Fellow in the Department of Communications and New Media, National University of Singapore. Her work focuses on young women, social media, and political subjectivity in Southeast Asia.

Appendix

Table 1. Themes and questions in focus group and data analysis.

Themes	Questions
Ideological positioning	• How important are issues related to LGBT to you personally? • What do you the people you know in real life *and* on social media think about the issue?
Opinion climate estimation	• Do you feel most Singaporeans (in real life/on social media) are supportive of LGBT?
Opinion climate indicators	• Can you elaborate on the types of information in social media that give you an idea of what majority of Singaporeans think about LGBT? • Do you seek for such information on social media? • How important are the different types of information to you when you are trying to find out what majority of Singaporeans feel about LGBT?
Mass media cues	• Can you elaborate on the types of information from mass media (e.g., news, articles, pictures, etc.) that had enabled you to get an idea of what majority of Singaporeans think about LGBT?
Interpersonal cues	• On the overall, are the people in your social media networks generally supportive or not supportive of LGBT? • Can you elaborate on the types of information your social media networks (e.g., comments, news, reactions, videos, etc.) that helped give you an idea of whether Singaporeans are generally supportive of LGBT or not.
Opinion accuracy and evaluation	• Based on the different types of information from mass media and social sources on social media that you had mentioned earlier, please share how much do you trust and believe the information coming from them.

Table 2. Lists the young Muslim women's groups studied, their popularity, and the themes emerging from their Instagram posts.

Name of group	City	Number of local chapters[a]	Active online	Active offline	Number of followers on Instagram[b]	Average number of posts monthly[c]	Themes of Instagram posts
Dunia Jilbab (DJ)	Jakarta	0	Yes	No	1,000,000	1,158	a) Religious commentary b) Productivity c) News related to Muslims d) Veiling e) Love and relationship f) Family g) Announcement of events h) Advertorial
Ukhti Sally (US)	Bekasi	0	Yes	Rarely	400,000	143	a) Religious commentary b) Productivity c) News related to Muslims d) Veiling e) Love and relationship f) Family g) Announcement of events h) Advertorial
Peduli Jilbab (PJ)	Depok	44	Yes	Yes	280,000	116	a) Religious commentary b) Productivity c) News related to Muslims d) Veiling e) Love and relationship f) Family g) Announcement of events h) Advertorial
Hijabers Community (HC)	Jakarta	8	Yes	Yes	100,000	42	a) Announcement of events b) Religious commentary c) Advertorial d) News related to Muslims
Jogjakarta Muslimahpreneur Community (JMP)	Yogyakarta	0	Yes	Yes	7,000	27	a) Announcement of events b) Religious commentary c) Advertorial d) News related to Muslims
Tasikmalaya Hijabers (TH)	Tasikmalaya	0	Yes	Rarely	1,500	5	a) Announcement of events b) Advertorial

Notes: a) As of 2018. b) The count is approximate in 2018 based on each account's profile page. c) Average of posts from 1 June to 31 December 2015.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 115–127
DOI: 10.17645/mac.v7i2.1959

Article

Digital Literacies Learning in Contexts of Development: A Critical Review of Six IDRC-Funded Interventions 2016–2018

Michelle Schira Hagerman

Faculty of Education, University of Ottawa, Ottawa, ON K1N 6N5, Canada; E-Mail: m.s.hagerman@uottawa.ca

Submitted: 9 January 2019 | Accepted: 10 March 2019 | Published: 11 June 2019

Abstract
As global development agencies and governments seek to address the United Nations' Sustainable Development Goal 4 for Universal Education, evidence of the real impacts of digital literacies interventions in local contexts are needed. This critical review of the designs, impacts and markers of quality of six literacies interventions offers new insights into the strengths and weaknesses of *fixed* and *open* approaches to literacies learning in contexts of development. Open interventions offered greater promise for learning a range of digital literacies practices than fixed interventions, even though fixed interventions, based on mobile and web-based apps were inherently digital. This raises important questions about the ways literacies have been conceptualised in development research.

Keywords
digital learning; digital literacies; development; SDG4; Sustainable Development Goals; universal quality education

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

The United Nations' sustainable development agenda (2015) focuses on seventeen fundamental and interconnected goals that include the eradication of poverty and hunger, gender equality, and environmental stewardship. Framed by ambitious action plans, the realization of these sustainable development goals (SDGs) will mean a safer, healthier, more equitable, and prosperous world by 2030.

The SDGs inform priority development investments by governments, NGOs, and development agencies including Canada's International Development Research Centre (IDRC). Between 2016 and 2018, the IDRC supported research on more than forty initiatives that respond to Sustainable Development Goal 4 (SDG4)—the call for universal quality education.

Defined in the *Education 2030 Incheon Declaration and Framework for Action for the Implementation of SDG 4* (UNESCO, 2016), *quality education* is understood to be equitable, inclusive, and accessible by design. According to the Incheon Declaration, quality education fosters, "creativity and knowledge, and ensures the acquisition of the foundational skills of literacy and numeracy as well as analytical, problem solving, and other high-level cognitive, interpersonal and social skills" (UNESCO, 2016, p. 8). The declaration describes the importance of digital and information communication technology (ICT) literacies for working and living in economies that are increasingly "knowledge-based and technology driven" (p. 22) and it advocates for systems of schooling that serve these fundamental needs. The declaration identifies the potential for ICTs to strengthen education systems, and encourages their use for knowledge dissemination, for the provision of access to quality learning, and for effective service provision (p. 36). However, as Prinsloo and Krause (in press) write, digital media should be viewed as "translocal resources that operate in local contexts and offer particular kinds of located agency and engagement to young children in ways that are tied up with where they are and who they are" (p. 2). Any evaluation of digitally-mediated learning interventions, including digital literacies interventions, must therefore consider the ways that context will shape meaning-making. A tablet

computer placed in a refugee settlement in Jordan and in a school in rural Cambodia will mean different things and enable different meaning-making activities because, as Prinsloo and Krause suggest, the context and the experiences of the children also differ. This focus on the local situatedness of technology use stands in tension with broad concerns for access, efficiency, and scalability in education development initiatives (Lim, Tinio, Smith, & Bhowmik, 2018). To address the ambitious goals of SDG4 globally, solutions that give more and better access to quality learning at scale are required. However, in a scoping review of digital learning initiatives in seven developing countries, Gaible, Mayanja, and Michelazzi (2018) question whether "standardised tools" are the answer, given that roll-outs of software can "lead to unexpected and unbudgeted costs" and require massive human resources investment to manage and make sense of data gathered with these tools (p. 50). In this research, I question whether there is a middle ground rooted in the complexities of local contexts and learning with technologies, while also moving more youth toward the broader goals of quality learning identified in the Incheon Declaration (UNESCO, 2016).

Part of a larger thematic analysis of forty-four digital learning reports funded by Canada's IDRC (Hagerman & Hagerman, in press) the current analysis focuses specifically on the literacies-oriented research in this broader agenda, and the ways that digital literacies have and have not been conceptualised, supported, and practiced in five different global development contexts.

2. Conceptions of Digital Literacies

Literacies are ways of making, transforming, negotiating, and communicating meaning (New London Group, 1996). Literacies are socially situated (Gee, 1992; Heath, 1983), framed by purpose (Britt, Rouet, & Durik, 2018; RAND Reading Study Group, 2002) and require the activation of diverse and multiple skills, strategies, practices, and dispositions that are also shaped by the nature of the text being read, created or shared (Cho & Afflerbach, 2017; Leu, Kinzer, Coiro, Castek, & Henry, 2013; Mills, 2015). Literacies practices, including digital literacies practices such as blogging, social media participation, or digital video production (Lankshear & Knobel, 2011) also depend on students' interests and motivations (Curwood, Magnifico, & Lammers, 2013; Guthrie et al., 1996; Moje, Overby, Tysvaer, & Morris, 2008).

Digital literacies, in particular, are situated in digital contexts—for example, the Internet—and as such, include ways of making, transforming, negotiating, and communicating meaning that are inherently multimodal (Kress, 2003; Rowsell, 2013), deictic (Leu et al., 2013), and require skills, strategies, and dispositions that both include and extend those required for reading and writing print (Coiro, 2011; Spires, Bartlett, Garry, & Quick, 2012).

Increasingly, scholars recognize digital tools and literacies as *placed* resources (Prinsloo, 2005; Rowsell, Saudelli, Scott, & Bishop, 2013) that take on and enable the creation of meaning in relation to where they are used, when they are used, how they are used, by whom and for what situated purposes (Prinsloo & Rowsell, 2012). This view of digital tools and digital literacies practices as situated or *placed* is a core theoretical assumption underpinning the current analyses. In this way, context is seen as central, and something to work with rather than to work against or control (cf. Selwyn, 2010). A "strong contextual analysis" has also been advanced as a key recommendation by the World Bank (2016) for designing use of ICTs to support learning among children living in conflict in the Middle East and North Africa (MENA) region (p. 12).

3. Digital Literacies Teaching and Learning

Much of the theory and research on digital literacies teaching in contexts of schooling has been generated by scholars trained in, living, and working in advanced global economies (e.g., Leu et al., 2013; Mills, 2015; New London Group, 1996; Rowsell et al., 2016, Spires et al., 2012). In very broad terms, this scholarship has emphasized the importance of disciplinary problem-based inquiry and digital media production in school as promising approaches for learning digital skills and for developing foundational critical and evaluative dispositions for making media with, and from, digital texts (e.g., Coiro, Castek, & Quinn, 2016; Dwyer, 2016; Miller, 2013; Spires, Kerkhoff, & Graham, 2016; Stornaiuolo & Thomas, 2018). Several studies suggest that projects driven by students' interests and experiences, that invite collaboration, and that incorporate the use of multimodal digital composition and participatory practices can enable exploration of culture and identity, support student agency development, and digital literacies learning concomitantly (e.g., Garcia, Mirra, Morrell, Martinez, & Scorza, 2015; Hughes, 2008; Kafai, Fields, & Searle, 2014; Santoy, 2013). In sum, digital literacies instructional practices defined, developed, theorized, and researched in the Global North centralize student voice, choice, and action, while also supporting development of digital skills for particular purposes that go beyond decoding and using information. Digital literacies include knowing how to create digital texts, and how to participate in digital conversations (International Literacy Association Literacy Research Panel, 2018). Digital tools are rarely the starting point for digital literacies instructional design. Rather, teachers, who are also viewed as designers, facilitators, collaborators, and supporters, integrate technologies that advance learning goals, often in collaboration with students (Bekker, Bakker, Douma, van der Poel, & Scheltenaar, 2015; Hagerman, 2017; Spires et al., 2016).

In comparison, there is little published scholarship documenting similar approaches taking root in schools located in the Global South (Byrne & Burton, 2017; Carlson & JBS International, 2013; Gaible et al., 2018). Gaible and colleagues (2018) note that small educational

technology interventions led by NGOs or private sector investors rarely include research, which limits understanding of the local conditions under which interventions may or may not be successful (p. 49). Recent surveys conducted by GlobalKidsOnline in Ghana (UNICEF Ghana, 2017) and Montenegro (Logar, Anzelm, Lazic, & Vujacic, 2016) show that children age 9–17, use the Internet to search for information, to share photos and videos, to chat online, and to play online games at home, but at school, Internet use is mostly for practicing skills or finding information. Blogging, video production, or social media participation for learning are rarely reported as school-based activities. There could be several reasons for this, including infrastructure and teacher training—issues that have been identified in reviews of what works to support student learning more broadly in contexts of development (e.g., Evans & Popova, 2016). However, given the fundamental role that digital composition, creation, and participation are understood to play in personal, social, economic, academic, and professional activities today (e.g., International Literacy Association Literacy Research Panel, 2018; Jenkins, Ito, & boyd, 2016) research on digital creation, digital participation, online inquiry, and communication in schools in the Global South is urgently needed as a point of reference to inform the design of locally grounded digital literacies teaching interventions. As governments, NGOs, and development agencies work toward universal education for all, research is needed to inform the design of effective, contextually-grounded, digital literacies learning that prepares learners for digitally-networked and knowledge-oriented futures.

4. Research Questions

Given this need, the current study asks: How do digital learning interventions funded by the IDRC between 2016–2018 advance understandings of literacies learning, and in particular the digital literacies learning and practices of children and youth in contexts of development? To address this overarching question, the study is framed by three subquestions:

a) How have literacies interventions been designed in this set of studies?
b) How, if at all, have these interventions been shown to support digital literacies practices such as participation in social networks, composing digital texts, finding information, or critically evaluating digital information?
c) What markers of quality, as defined in the Incheon Declaration, are evident in these interventions?

5. Method

This study uses methods of descriptive analysis and thematic analysis to respond to the research questions (Braun & Clark, 2006; Miles, Huberman, & Saldaña, 2014).

5.1. Sample and Inclusion Criteria

Studies included for analysis in the current research were selected from a corpus of 44 reports supported by the IDRC between 2016–2018 (Hagerman & Hagerman, in press). Studies included for the current analysis were (a) empirical in their design and included primary data collection, (b) conducted in a school or education centre, (c) included children and youth as primary participants, (d) focused on children's literacies learning with digital applications or through interactions with digital devices. The six studies retained for analysis are summarized in Table 1.

5.2. Data Analysis

Memoing framework. To answer each of the research subquestions, I read the reports of research and used a framework informed by the research questions to guide my process of information gathering and open memoing (Miles, Huberman, & Saldaña, 2014). The criteria and definitions of markers of quality, in particular, align with the Incheon Declaration (UNESCO, 2016) and its definitions of quality education. I read for the following information across the studies:

How are the interventions designed? (descriptions)

- Stated purpose of the instructional intervention?
- Literacies learning and teaching goals?
- What digital tools are used?
- What is the role of the teacher?
- Contextual challenges?

What measured impacts on literacies are reported? (summary of findings)

Markers of quality? (with definitions)

- Equitable? Do boys and girls participate and perform equally?
- Inclusive? Do all students, including those with special learning needs, participate and benefit?
- Encourage creativity? Are children making meaning through digital creation? Are they crafting or producing new things or solving novel problems in new ways?
- Content Knowledge acquisition? Does the intervention focus on learning the core knowledges, strategies, and skills of a discipline, such as how to decode strings of letters for young learners, or how to create a program using SCRATCH for older youth?
- Analytical, problem-solving skills? Does the intervention require application of disciplinary knowledge to solve meaningful problems?
- Interpersonal and social skills? Does the intervention enable learners to collaborate, share, negotiate, work toward a common goal?

Table 1. Summary of studies retained for analysis.

Authors	Country & Context	Participants	Digital Tools
Cheung and Guo (2018)	China (Hunan)	Grades 1–3 Children	*ABRACADABRA (A Balanced Approach for Reading Always Designed to Achieve the Best Results for All)* Early literacy web-based application
Koval-Saifi and Plass (2018a)	Jordan (refugee camps)	Syrian children & their parents	*Antura & the Letters* early literacy mobile app
Koval-Saifi and Plass (2018b)	Jordan (refugee camps)	Syrian children & their parents	*Feed the Monster* early literacy mobile app
Metni (2018)	Lebanon (Beirut and rural contexts)	High School Students and their Teachers	*Raspberry Pi microcomputer, Python & Scratch programming languages*, Internet, & physical materials for projects
Oakley, Pegrum, Kheang and Seng (2018)	Cambodia in Grades 1–3	Primary Students	*Aan Khmer (Read Khmer)* early literacy mobile app
So, Shin, Wong and Lee (2018)	Mongolia	Grade 6 and Grade 10 Students & their Teachers	Mobile phones, Facebook social media platform

Once these data were curated, I read across memos to identify common and divergent trends, to categorize the design structures of the interventions, to identify themes (Braun & Clarke, 2006), and judge markers of quality. Inductive thematic analysis was used to understand the types of challenges reported in these studies. To visualize and revise the challenge themes, I used a web-based tool called Mindup. For the markers of quality, I used the definitions listed above and a simple yes/no/not clear from report framework, to evaluate each study. I discussed my analyses with the co-author of a larger study (Chris Hagerman), a historian whose expertise in the fields of international relations and education in colonial contexts, surfaced a range of critical insights. He helped me to revise and strengthen the thematic analyses so that they closely aligned with our shared understandings of the data. Together we settled on categories, themes, and judgment of quality markers.

6. Results

6.1. Design of Literacies Interventions

Fixed interventions. Four studies focused on digital software applications and their impact on young children's concepts of print and emergent reading skills (Cheung & Guo, 2018; Koval-Saifi & Plass, 2018a, 2018b; Oakley et al., 2018). Although digital in delivery, these interventions did not intentionally support or develop digital literacies skills such as website navigation or information finding. I characterized these interventions as *fixed* because the applications lead children through practice activities in pre-determined sequences engineered to support the development of foundational literacies skills such as memorizing letter names and learning letter sounds. All applications include game-based elements such as levels or rewards for particular learning achievements. There is some choice within these games; however, learners can not modify the substance of their learning because it is bounded by the design constraints of the applications and the devices used for access.

Role of the teacher. All fixed interventions were designed to minimize or eliminate the need for a teacher because in these contexts, class sizes can be large (e.g., Cambodia and China), teachers may have had limited training in how to teach literacies (e.g., Cambodia and China) or there are simply no teachers available (e.g., refugee camps).

In Table 2, I summarize the literacies learning purposes of each application and the skills practiced by participants in these four studies.

Open interventions. I characterize the studies conducted by Metni (2018) in Lebanon and So et al. (2018) in Mongolia as *open interventions*.

The Coder Maker project (Metni, 2018) was designed to "improve the quality and accessibility of learning for refugees and host communities in and outside the classroom in Lebanon using digital innovations" (p. 2). The influx of Syrian youth who have experienced trauma and/or missed many years of schooling has placed enormous pressures on Lebanese schools and raised important questions about how to build cohesive school communities. According to the observations of teachers in this study, Syrian students tend to lack confidence, often demonstrate violent behaviours, and drop out of school to work (pp. 13–15). Students in the study reported feeling disconnected and unmotivated at school. This intervention builds on principles of maker-centred learning for empowerment (Agency by Design, 2018). Teachers and students learn to code using SCRATCH (scratch.mit.edu) or Python on Raspberry Pi (https://www.raspberrypi.org). Then, as integrated

Table 2. Summary of fixed design applications, their purposes and emergent literacies skills practiced.

Application	Language	Purpose	Literacies Skills Practiced
Antura & the Letters	Arabic	Build foundational literacies skills in Arabic and improve the psychosocial well being of Syrian refugee children	Letter recognition and naming Letter sounds Sound-letter matching Sight word recognition Sight word meanings
Feed the Monster	Arabic	Build foundational literacies skills in Arabic and improve the psychosocial well being of Syrian refugee children	Letter recognition and naming Letter sounds Sound-letter matching Sight word recognition Sight word meanings
ABRACADABRA	English	To help the reading literacy proficiency of children	Letter recognition Letter sound recognition Word segmenting Modelled reading to support fluency Writing event sequences Listening comprehension Reading comprehension
Aan Khmer	Khmer	Improve the reading competencies of early grade children in Khmer	Letter recognition and naming Letter sounds Sound-letter matching Sight word recognition Sight word meanings Listening/reading comprehension (mini-stories)

teams, Syrian and Lebanese students, with teacher support, collaborate to identify and solve a problem of meaning in their community. One team, for example, designed a pair of glasses with integrated sensors to help a visually impaired girl move more safely in her world.

The mobile, gamified, participatory language learning intervention developed and tested in Mongolia (So et al., 2018) aimed to "investigate how gamification and social media can be incorporated into the design of an effective mobile-assisted language learning program in Mongolian public schools, in order to promote effective contextualized learning experiences" (p. 3). Changing climate has forced significant migration from rural areas to the capital city of Ulaanbaatar in Mongolia, putting stress on public schools. Children often attend school for half days so that two shifts of students can share the same school buildings (So et al., p. 3). The mobile, hybrid nature of this learning intervention meant that students with internet at home could continue learning English after hours. At school, and for homework, students completed participatory activities for diverse purposes on Facebook including creating videos, and role-playing shopping for clothing as their teacher served as salesperson. One teacher said, "It definitely changed my teaching styles....I realized that I could use time outside of class for student learning. I think that time should be used wisely, so I am giving students some homework to do after class" (p. 25). Digital literacies were not explicitly theorized in this study but digital literacies practices such as digital video creation and social media participation were leveraged to support English language learning.

As with the fixed interventions, the open interventions were also designed in response to situated needs. In the Lebanese context, the digital tools were placed to support social cohesion and disciplinary learning in science and computer science; in Mongolia, mobile phones and Facebook were placed to make English language learning and communication accessible beyond the very short school day. Digital literacies practices such as online reading and research, writing computer programs, creating videos, and sharing posts on Facebook were part of these intervention designs, although neither study situated these practices in digital literacies theory or research.

Role of teachers. Open interventions positioned teachers as "co-designers" who supported their students in meaningful, purposeful communication and problem-solving. Unlike the fixed interventions, and more in line with current conceptions of digital literacies teaching (e.g., Coiro et al., 2016; Spires et al., 2016), open interventions positioned teachers as dynamic experts, able to shift supports in response to learners' needs, and in ways that gradually moved learners toward complex disciplinary and digital literacies practices. For example, one teacher in the Coder Maker study said:

> Here, I am a learner too and I am discovering my students and how they are thinking, how I can do

> things in a new way....It is a shift in thinking, before I needed to control and tell students what to do in the projects....I have followed their thinking progression. It has given space for conversation, for listening, for hearing for communication. There is so much more I can and will do as a teacher. (Metni, 2018, p. 21)

Contextual challenges. Across all studies, I constructed five cross-cutting themes from the contextual challenges reported. Presented in Table 3, these themes offer a more nuanced framework for understanding the situatedness of digital literacies interventions in contexts of development. As placed resources (Prinsloo, 2005) digital tools and interventions designed for these complex realities may offer more promising pathways to learning.

Design Summary. Although fixed and open interventions were all designed to address complex constellations of local challenges in contexts of development, they were built for learners of different ages and developmental stages, and on different assumptions about technologies, teachers, and methods of supporting literacies learning. In fixed interventions, technologies were used

Table 3. Thematic analysis of contextual challenges.

Theme	Subthemes
Infrastructure	Internet Infrastructure • Unreliable electricity (Koval-Saifi & Plass, 2018a, 2018b) • No internet; spotty wifi (all six studies) • No wifi or mobile device at home for students (So et al., 2018) • Server failure (Cheung & Guo, 2018) Human Infrastructure • Someone needs to charge tablets (Oakley et al., 2018) • No safe place to keep tablets in schools. Teachers take them home and/or devise creative ways of distributing tablets so they are not all stored together (Oakley et al, 2018) Physical Infrastructure • Remedial education centres in refugee settlements sometimes used for other purposes, therefore reducing access to the apps (Koval-Saifi & Plass, 2018a, 2018b)
Time Constraints	Related to School Schedules • Need more time to build projects (Metni, 2018) • Only four hours/day at school (So et al., 2018) • Conflicts between planned workshops and school schedules (Metni, 2018) • Very short break times for peer tutoring (Oakley et al., 2018) Related to Use of Application • Less time spent learning with app than recommended (Cheung & Guo, 2018; Koval-Saifi & Plass, 2018a, 2018b; Oakley et al., 2018)
Teachers	Teacher Knowledges • Teachers need training in phonics and application use (Cheung & Guo, 2018) • Lack of technical knowledge in the school among teachers and support staff (Oakley et al., 2018) • Teacher perceptions of struggling readers as "lacking in focus" may interfere with app use for students who need the practice most (Oakley et al., 2018) Teacher Investment • Teacher facilitation required to keep language learning and online participation going on Facebook (So et al., 2018) • Coder-Maker required a great deal of time and teacher buy-in (Metni, 2018). • Additional burden to use Aan Khmer without additional compensation (Oakley et al., 2018)
Contexts in crisis	War and Trauma • Itinerant nature of life in refugee camps impacted access to the apps (Koval-Saifi & Plass, 2018a, 2018b) • "The crisis itself is putting major demands on school administrators" (Metni, 2018) Climate change • Extreme climate and economic crisis means that people in rural areas are abandoning nomadic lifestyle and moving to the city (So et al., 2018)
Systems and cultures of schooling	• Bureaucracy of permissions, scheduling, payment and reimbursement in schools (Metni, 2018) • Schools ban mobile phones (So et al., 2018) • "The majority of teachers in my school are old. While I want to bring new ideas to teaching, I often feel constrained due to the hierarchical system in my school." (So et al., 2018)

to replace or minimize the role of teachers. Digital applications were used for independent practice of discrete emergent literacies skills, but not emergent digital literacies skills. In open interventions, designed for middle-school and high-school students, teachers were empowered to design active, collaborative learning that leveraged the affordances of particular tools for particular learning purposes. Although the Incheon Declaration (UNESCO, 2016) identifies ICT literacies as fundamental for participation in knowledge-based economies, and participants in all studies used digital tools to learn disciplinary content, none of these IDRC-funded designs included conceptualizations of digital literacies learning as central research concerns.

6.2. How, If All, Have These Interventions Supported Digital Literacies Learning?

Fixed interventions. All studies of fixed interventions measured literacies outcomes with standardized early reading measures. Three of the studies (Koval-Saifi & Plass 2018a, 2018b; Oakley et al., 2018) used pre-post designs with the Early Grade Reading Assessment (RTI International, 2015), a test developed specifically for use in contexts of development. One study (Cheung & Guo, 2018) compared treatment and control participants' performance on the Group Reading Assessment and Diagnostic Evaluation (GRADE; Pearson Education, 2014) and on the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; University of Oregon Centre on Teaching and Learning, 2018).

These tests measure performance on indicators understood to predict reading comprehension, such as letter naming, familiar word recognition, non-word reading (decoding), and sound-letter matching; none of them measure foundational digital literacies, or make reference to the ways that the foundational literacies skills developed with these tools might correlate with foundational digital literacies skills, such as web navigation, information search, and sharing. Given research that has shown offline reading comprehension ability predicts online reading comprehension ability (Coiro, 2011) emergent literacies skills learned via digital applications may also support emergent digital literacies skills, but this cannot be known from these studies.

That said, ABRACADABRA improved treatment participants' phonemic awareness, phonological awareness, segmenting, non-word reading, and initial sound fluency (Cheung & Guo, 2018). The composite indices on the GRADE and DIBELS tests were also statistically significantly higher for the treatment participants in this study relative to the control group. Evidence suggests that this application, more than the others, had widespread and positive effects on early literacies skills that it aimed to improve for English language learners.

The results for the other three applications were less clear. With Aan Khmer, app use was associated with gains on some predictive literacies measures for high-use participants vs. low-use participants, but a regression model showed that 34.9% of the variance in participants' reading comprehension scores was explained by eight other variables: student gender (girls did better), grade level (older children did better), parental support (more was better), ability to borrow books from the library (positive correlation), the school director's level of education (higher level was better), the presence of multi-grade classes (positive correlation), the number of tablets provided (positive correlation), and the number of peer tutors (fewer was better). This finding suggests that human and environmental factors were important determinants of reading development. Older children with access to library books and to adults who were able to create affirmative, supportive learning opportunities, did better on the literacies measures. The enabling effects of these non-app-related variables offer counterpoints to the underlying assumption that the applications alone suffice for adequate literacies learning.

For children learning Arabic with Antura and the Letters, statistically significant gains appeared at posttest on measures of non-word reading (decoding) and oral reading fluency. Similar to the findings for Aan Khmer, older children and children with some literacies knowledge at pretest showed the largest absolute gains on all measures. For Antura, boys outperformed girls on all measures. Data from the Feed the Monster study were similar. Boys generally outperformed girls on tests of letter sound knowledge and syllable reading. Yet, the rate of change for girls was higher on all tasks, suggesting that girls showed more progress in the same amount of time from their baseline levels after using this application, even though in absolute terms, they did not score as high at posttest. Older children who had some literacies knowledge before using the app performed best on comprehension measures. The application may, therefore, have been most useful as a review for children who already knew how to read.

It is important to note that the measured, positive impacts of these four applications on predictive measures does not mean that children who use these applications will become capable readers—much less digitally literate—if, for example, they lack access to rich and varied experiences with diverse printed and multimodal texts at school and at home, or if contexts limit access to rich and varied models of oral language production (Duke & Carlisle, 2011).

Open interventions. Both open intervention studies used student and teacher survey data and focus group discussions to describe the learning impacts of the intervention. The Gamified Social Media study in Mongolia (So et al., 2018) measured treatment and control group performance on tests of listening comprehension, reading comprehension, and writing skills. At posttest, reading comprehension skills had improved significantly, relative to the control group, suggesting a treatment effect for active, creative, social media participation. This was supported by student perceptions of learning gains.

One student said, "Facebook helps us to understand English topics better and to express better ideas because [Facebook] is like a continuing class" (p. 26).

In terms of the digital literacies practices reported in the Coder-Maker study, coding skills in SCRATCH and Python were not explicitly measured, although, during focus group sessions, teachers did comment on the ways students learned to integrate disciplinary and digital literacies learning. "The program...enhances all the disciplines together, it is more than just math or IT, or coding...or Rpi [Raspberry Pi] or science or language. Putting them together in Real Life this way makes it all stronger" (Metni, 2018, p. 16). Another teacher said, "We gained logic, computational thinking and basic programming skills which enables us to take our learning to the next level;...we value how technology fits together in our subjects, in math, in physics, language" (Metni, 2018, pp. 16–17). Teachers also judged students' digital learning projects on criteria such as quality of code, use of information, integration of information, collaboration, sharing knowledge, communication, and quality of the digital creation. Teachers judged the work on these criteria to be good or excellent in most cases (p. 43).

In the Social Media study, the strongest evidence for improved digital literacies practices came from students' reports of their activities. One student said, "I liked making videos with friends. It was difficult but we really enjoyed it. We spend hours to make 30-second video" (p. 26). Students also reported greater confidence with social media and a preference for its multimodal affordances for literacies-learning purposes over textbooks.

Summary of reported impacts. All of the interventions seemed to support literacies learning in some way. In terms of digital literacies learning specifically, however, only open interventions included diverse digital literacies practices designed to support disciplinary science and English language learning. Despite significant contextual challenges, these interventions offer strong models for digital literacies learning that work, in part because they embrace local needs and empower local teachers and students.

6.3. Markers of Quality

In Table 4, I synthesize reported evidence related to six key markers of quality across all six studies.

In interpreting these judgments, it is important to note that all of the interventions were intended to give access to learners who might not otherwise experience digital learning opportunities. In this way, all of the interventions are meant to advance equity and inclusion. However, it is clear that when held up to defnitions of quality, as framed by SDG4, there is variability. Judgments of equity, as presented in Table 4, were based on the relative participation and performance of boys and girls. With ABRACADABRA, boys and girls participated and performed at similar levels. With Aan Khmer, boys and girls participated equally, but girls out-performed boys on literacies measures. With the Antura and Monster apps, boys generally outperformed girls, suggesting that boys may have had more hands-on time with the application, or that the designs may have aligned with boys' interests or learning processes. For Coder-Maker, boys were more likely to participate in classroom-based projects than girls (75% boys; 25% girls), perhaps reflecting teacher biases because teachers selected the participants for workshop participation. At the community-based events in this study, more than half the participants were girls, so gender equity findings here are mixed. The Mongolia study reported no clear evidence of gender-based participation and performance.

In terms of inclusion, Aan Khmer was used by some struggling readers for extra literacies practice, but for many children, the instructions were difficult to follow and the time allotted for extra practice limited (Oakley et al., 2018, p. 95). None of the other studies reported explicitly on the participation or involvement of children with particular literacies learning needs; so, although children with reading or writing differences may have been included in these studies, it is not clear whether these children benefitted. This is a significant gap in these reports of research.

Table 4. Summary of quality markers.

	Fixed Interventions				Open Interventions	
	ABRA	**Aan Khmer**	**Antura**	**Monster**	**Coder-Maker**	**Social Media**
Equitable?	✓	✗	✗	✗	✗	⊙
Inclusive?	⊙	⊙	⊙	⊙	⊙	⊙
Creativity?	✗	✗	✗	✗	✓	✓
Content Knowledge Learning?	✓	✓	✓	✓	✓	✓
Analytical & Problem-solving skills?	✗	✗	✗	✗	✓	✓
Interpersonal & Social Skills?	✗	✓	✓	✓	✓	✓
Total Markers	2	2	2	2	4	4

Note: ✓ = Yes; ✗ = No; ⊙ = Not clear from report of research.

Regarding creativity, only the open interventions met the definition of creativity and problem-solving as building new things or solving new or meaningful problems.

In terms of interpersonal and social skills, open interventions included collaborative, communicative literacies practices in their designs. Where fixed interventions surfaced interpersonal activities, they tended to evolve organically as children shared what they learned with one another. This suggests that even if an application is designed for independent use, children may prefer to interact around it because of the situated agency such interactions afford them (Prinsloo & Krause, in press). This may be a place-based design consideration important to future work on literacies learning, including digital literacies learning, in the most challenging contexts of development. In the absence of teachers, app designs that intentionally centralize peer-to-peer sharing, interaction, questioning, and collaboration may be an important middle-ground between the independently oriented fixed applications seen in this set of reports, and open applications that require investment in teachers, teacher training, wifi, and physical spaces for learning.

Taken together, all of the interventions reviewed align with some markers of quality education as defined by UNESCO (2016). Open interventions, however, offer an advantage for creativity and problem-solving.

7. Discussion

Based on these analyses, how have digital learning interventions funded by the IDRC between 2016–2018 advanced understandings of literacies learning, and in particular the digital literacies learning and practices of children and youth in contexts of development? The analysis of these six studies offer four essential insights on which to build future research.

First, this work shows that for young children, priority investment in literacies learning in contexts of development has been directed toward fixed interventions—mobile, game-based applications that minimize the need for human teachers because they are too few or entirely absent in particular contexts. Although one application, ABRACADABRA (Cheung & Gho, 2018) supported all of the emergent literacies skills it targeted for English language learners in China, the other three applications proved less effective. When effective, gains were modest and tended to show that older children (aged 7+) and children with the strongest literacies skills at pre-test benefitted most. This suggests that independent, self-contained app use, particularly in very challenging contexts of development such as refugee camps, may not be justified for younger children. Arguably, learning letter names and sounds via mobile app is better than no literacies learning of any kind, but it seems important, given the mixed effects, to question the return on investment for this approach. Would the same level of investment in local teachers offer more literacies benefits? In a rigorous review of six syntheses of educational-intervention research conducted in diverse contexts of development globally, Evans and Popova (2016) found that "pedagogical interventions that match teaching to students' learning, and individualized, repeated teacher training associated with a specific method or task are effective at improving student learning" (p. 22). Carolson and JBS International (2013) also note that in contexts of extreme crisis, "human ware" is more important than the technologies. What really matters for student learning seems to be well-trained teachers. To find an effective middle ground, the design of digital literacies interventions should begin with a thorough contextual analysis of how to place not just devices and apps in children's hands, but also teachers who can help youth make meaning from and with these tools.

Some of the learning benefits with fixed applications seemed to come from peer interactions around app use. In the Aan Khmer study (Oakely et al., 2018) nearly 35% of the variance in reading comprehension was attributable to a constellation of non-app related factors, including access to library books and adults who were able to create opportunities for learning, suggesting that mobile and web-based applications can support some young learners in some contexts, but greater gains may be expected from interventions that emphasize peer-to-peer collaboration and include more opportunities for children to interact with diverse text genres, and to create texts through play (Marsh, 2004; Wohlwend, 2009). Funders of fixed interventions should consider a more diverse constellation of supports, including human supports, that together, might better advance the emergent literacies of young children. Conceptions of literacies must include digital literacies skills and knowledges so that investments help children to use and create all of the types of texts they are likely to encounter in their lives.

This leads to a second significant insight. Although digital in modality, none of the fixed interventions considered how digital environments interact with the early literacies skills of focus, or how these applications might be (re)designed to support early digital literacies learning in contexts of development. This is a significant limitation and deserves research attention, particularly if development agencies continue to invest in digital applications. As Leu et al. (2013) note, printed-literacies learning and digital-literacies learning are not isomorphic processes. Given the ways that digital media, tools, and networks shape literacies activities at school, at work, and in personal lives, digital literacies learning must become a priority focus for quality educational interventions globally if SDG4 is to be realized by 2030 (ILA Literacy Research Panel, 2018).

Third, the open interventions reviewed in this analysis offer promising models for integrated disciplinary and digital literacies learning in contexts of development for teens. In contexts where challenges from infrastructures to human security might be viewed as insurmountable barriers, these studies show how digital literacies practices can be integrated with disciplinary learning

practices in schools. These designs emphasized (a) student agency and choice, (b) teachers and students as co-learners and collaborators, and (c) disciplinary learning through interaction and collaborative problem-solving with digital tools. In brief, these interventions seem to align with research on what works in schools in the Global North (e.g., Agency by Design, 2018; Spires et al., 2016). Although neither study measured improvement in digital literacies skills or practices quantitatively, students and teachers perceived improvements in their coding, digital video production, and social media skills, and expressed a preference for these approaches over other types of learning.

Finally, as the global development community works toward SDG4, and considers the role of ICTs for school improvement and their potential for student learning, this set of six studies shows that both fixed and open interventions can address markers of quality education as defined in the Incheon Declaration (2016). However, only open interventions created opportunities for creative production with digital tools, for the application of digital skills to solve meaningful problems, and for long-term collaborations that allowed students to construct their own meanings with and through digital tool use (Prinsloo & Krause, in press). Researchers and funding partners should consider how to mobilize systems and resources to scale open interventions, and to explore similar designs for young children, who also deserve opportunities to create, to play, to solve meaningful problems and to leverage digital tools in ways that empower them to become fully literate. Moreover, it seems that development research agencies such as the IDRC could leverage expanded conceptions of literacies to inform funding decisions, and require strong, nuanced evidence of the ways that digital literacies interventions have been designed to reflect place.

8. Limitations

Findings are limited by the small number of empirical, literacies-oriented studies included in the original corpus of IDRC-funded research. Interventions were conducted in only five different contexts of development, and may not be applicable in parts of South America or Africa, neither of which are represented in the studies reviewed. Although I invited critical feedback from knowledgeable others, I must also recognize that my own perspectives may have occluded the importance of ideas germane to this analysis.

9. Conclusion

As governments, NGOs and development agencies work toward universal education for all (UNESCO, 2016) this study offers new insights based on six empirical studies of literacies learning with digital tools funded by Canada's IDRC. Two types of literacies interventions were identified—fixed and open. For digital literacies learning, open interventions offer the clearest promise. Even in extremely challenging contexts, these studies show that when interventions are designed for local contexts with local teachers, and when students are encouraged and supported to create diverse digital artifacts, they learn digital skills, disciplinary knowledges, and build more socially cohesive communities. To provide more youth with quality literacies education, development research agencies could require expanded conceptions of literacies learning that include creation, composition, and participation, while also funding research that centralizes social interactions, teachers, and teacher training as part of any digital learning initiative.

Acknowledgments

The author would like to thank Matthew Smith, Laurent Elder, Cristóbal Cobo, Eliane Metni, Vicki Tinio, Cher Ping Lim, Philip Abrami, Laryssa Lysenko, Glenda Cox, Michelle Willmers and Marwan Tarazi for their critical commentary on the larger report from which this research article emerged. She also thanks Chris Hagerman and three anonymous reviewers whose comments supported important revision to this manuscript.

Conflict of Interests

The author declares no conflict of interest.

References

Agency by Design. (2018). *The framework for maker-centred learning*. Retrieved from http://www.agencybydesign.org/explore-the-framework

Bekker, T., Bakker, S., Douma, I., van der Poel, J., & Scheltenaar, K. (2015). Teaching children digital literacy through design-based learning with digital toolkits in schools. *International Journal of Child-Computer Interaction*, *5*, 29–38. https://doi.org/10.1016/j.ijcci.2015.12.001

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*, 77–101. https://doi.org/10.1191/1478088706qp063oa

Britt, A., Rouet, J.-F., & Durik, A. (2018). Representations and processes in multiple source use. In J. L. G. Braasch, I. Bråten, & M. McCrudden (Eds.), *Handbook of multiple source use* (pp. 17–33). New York, NY: Routledge.

Byrne, J., & Burton, P. (2017). Children as Internet users: How can evidence better inform policy debate? *Journal of Cyber Policy*, *2*(1), 39–52. https://doi.org/10.1080/23738871.2017.1291698

Carlson, S., & JBS International. (2013). *Using technology to deliver educational services to children and youth in environments affected by crisis and/or conflict*. Washington, DC: USAID. Retrieved from https://www.usaid.gov/sites/default/files/documents/2155/ICTs

%20in%20Conflict%20Compendium%20FINAL.pdf
Cheung, A. C. K., & Guo, X. (2018). *Examining the effects of ABRACADABRA, a web-based literacy program for primary school students in rural China*. Quezon City: Foundation for Information Technology Education and Development, Inc. Retrieved from http://dl4d.org/portfolio-items/examining-the-effects-of-abracadabra
Cho, B.-Y., & Afflerbach, P. (2017). An evolving perspective of constructively responsive reading comprehension strategies in multilayered digital text environments. In S. E. Israel (Ed.), *Handbook of research on reading comprehension* (2nd ed., pp. 109–134). New York, NY: Guilford Press.
Coiro, J. (2011). Predicting reading comprehension on the Internet: Contributions of offline reading skills, online reading skills, and prior knowledge. *Journal of Literacy Research*, *43*(4), 352–392. https://doi.org/10.1177/1086296X11421979
Coiro, J., Castek, J., & Quinn, D. J. (2016). Personal inquiry and online research. *The Reading Teacher*, *69*(5), 483–492. https://doi.org/10.1002/trtr.1450
Curwood, J. S., Magnifico, A. M., & Lammers, J. C. (2013). Writing in the wild: Writers' motivation in fan-based affinity spaces. *Journal of Adolescent & Adult Literacy*, *56*(8), 677–685.
Duke, N. K., & Carlisle, J. (2011). The development of comprehension. In M. L. Kamil, P. D. Pearson, E. B. Moje, & P. P. Afflerbach (Eds.), *Handbook of reading research* (4th ed., pp. 199–228). New York, NY: Routledge. https://doi.org/10.4324/9780203840412.ch10
Dwyer, B. (2016). Teaching and learning in the global village: Connect, create, collaborate and communicate. *Reading Teacher*, *70*(1), 131–136. https://doi.org/10.1002/trtr.1435
Evans, D., & Popova, A. (2016). What really works to improve learning in developing countries? An analysis of divergent findings in systematic reviews. *The World Bank Research Observer*, *31*(2), 242–270. https://doi.org/10.1093/wbro/lkw004
Gaible, E., Mayanja, M., & Michelazzi, A. (2018). *Transforming education through technology: Second-stage report*. London: The Health Education Advice & Resource Team (HEART). Retrieved from https://www.heart-resources.org/assignment/a-scoping-study-transforming-education-through-technology
Garcia, A., Mirra, N., Morrell, E., Martinez, A., & Scorza, D. A. (2015). The council of youth research: Critical literacy and civic agency in the digital age. *Reading and Writing Quarterly*, *31*(2), 151–167. https://doi.org/10.1080/10573569.2014.962203
Gee, J. P. (1992). *The social mind: Language, ideology, and social practice*. New York, NY: Bergin & Garvey.
Guthrie, J. T., Van Meter, P., McCann, A. D., Wigfield, A., Bennett, L., Poundstone, . . . Mitchell, A. M. (1996). Growth of literacy engagement: Changes in motivations and strategies during concept-oriented reading instruction. *Reading Research Quarterly*, *31*(3), 306–332. https://doi.org/10.1598/RRQ.31.3.5
Hagerman, M. S. (2017). Les Bricoscientifiques: Exploring the intersections of disciplinary, digital, and maker literacies instruction in a Franco-Ontarian School. *Journal of Adolescent & Adult Literacy*, *61*(3), 319–325. https://doi.org/10.1002/jaal.699
Hagerman, M. S., & Hagerman, C. A. (in press). A synthesis of 44 digital learning for development reports: Lessons learned and implications for future research. Retrieved from https://docs.google.com/document/d/1fNnr7E8x78rYYUsbBh2FGQiCf_oQ_6h5jSo-7TftqIE/edit
Heath, S. B. (1983). *Ways with words: Language, life and work in communities and classrooms*. Cambridge: Cambridge University Press.
Hughes, J. (2008) The 'screen-size' art: Using digital media to perform poetry. *English in Education*, *42*(2), 148–164. https://doi.org/10.1111/j.1754-8845.2008.00012.x
International Literacy Association Literacy Research Panel. (2018). *Improving digital practices for literacy, learning and justice: More than just tools* [Literacy leadership brief]. Newark, NJ: International Literacy Association. Retrieved from https://www.literacyworldwide.org/docs/default-source/where-we-stand/ila-improving-digital-practices-literacy-learning-justice.pdf
Jenkins, H., Ito, M., & boyd, d. (2016). *Participatory culture in a networked era*. New York, NY: Polity.
Kafai, Y., Fields, D., & Searle, K. A. (2014). Electronic textiles as disruptive designs: Supporting and challenging maker activities in schools. *Harvard Educational Review*, *84*(4), 532–557. https://doi.org/10.17763/haer.84.4.46m7372370214783
Koval-Saifi, N., & Plass, J. (2018a). *Feed the monster: Impact and technical evaluation*. Washington, DC: World Vision and Foundation for Information Technology Education and Development. Retrieved from http://dl4d.org/publications-index/
Koval-Saifi, N., & Plass, J. (2018b). *Antura and the letters impact and technical evaluation*. Washington, DC: World Vision and Foundation for Information Technology Education and Development. Retrieved from http://dl4d.org/publications-index
Kress, G. (2003). *Literacy in the new media age*. New York, NY: Routledge.
Lankshear, C., & Knobel, M. (2011). *New literacies: Everyday practices and social learning* (3rd ed.). Maidenhead: Open University Press McGraw Hill Education.
Leu, D. J., Kinzer, C. K., Coiro, J., Castek, J., & Henry, L. A. (2013). New literacies: A dual-level theory of the changing nature of literacy, instruction, and assessment. In D. Alvermann, N. Unruh, & R B. Ruddell (Eds.), *Theoretical models and processes of reading* (8th ed., pp. 1150–1181). Newark, NJ: International Reading Association.
Lim, C. P., Tinio, V., Smith, M., & Bhowmik, M. K. (2018).

Digital learning for developing Asian countries: Achieving equity, quality, and efficiency. In K. J. Kennedy & J. C.-K. Lee (Eds.), *Routledge international handbook of schools and schooling in Asia* (pp. 369–381). New York, NY: Routledge. Retrieved from https://www.routledgehandbooks.com/doi/10.4324/9781315694382-35

Logar, S., Anzelm, D., Lazik, D., & Vujacic, V. (2016). *Global kids online Montenegro: Opportunities, risks and safety*. London: GlobalKidsOnline. Retrieved from http://globalkidsonline.net/montenegro-report

Marsh, J. (2004). The techno-literacy practices of young children. *Journal of Early Childhood Research*, *2*(1), 51–66. https://doi.org/10.1177/1476718X0421003

Metni, E. (2018). *Digital learning innovation for host communities (Lebanon and Jordan) and Syrian refugees (CoderMaker) project*. Retrieved from http://www.iea.org.lb

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook*. Thousand Oaks, CA: Sage.

Miller, S. M. (2013). A research metasynthesis on digital video composing in classrooms: An evidence-based framework toward a pedagogy for embodied learning. *Journal of Literacy Research*, *45*(4), 386–430. http://doi.org/10.1177/1086296X13504867

Mills, K. A. (2015). *Literacy theories for the digital age: Social, critical, multimodal, spatial, material and sensory lenses*. Bristol: Multilingual Matters.

Moje, E. B., Overby, M., Tysvaer, N., & Morris, K. (2008). The complex world of adolescent literacy: Myths, motivations, mysteries. *Harvard Educational Review*, *78*(1), 107–154.

New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, *66*(1), 60–92.

Oakley, G., Pegrum, M., Kheang, T., & Seng, K. (2018). *An evaluation of integration of m-learning in total reading approach for children plus (TRAC+): Enhancing literacy of early grade students in Cambodia*. Retrieved from http://dl4d.org/portfolio-items

Pearson Education. (2014). *Group reading assessment and diagnostic evaluation*. San Antonio, TX: Pearson. Retrieved from https://images.pearsonassessments.com/images/products/grade/grade_manual.pdf

Prinsloo, M. (2005). The new literacies as placed resources. *Perspectives in Education*, *23*(4), 87–98. Retrieved from https://www.learntechlib.org/p/99356

Prinsloo, N., & Krause, L. (in press). Translanguaging, place and complexity. *Language and Education*, *33*(2). Retrieved from http://www.education.uct.ac.za/edu/staff/academic/mprinsloo

Prinsloo, M., & Rowsell, J. (2012). Digital literacies as placed resources in the globalised periphery. *Language and Education*, *26*(4), 271–277. https://doi.org/10.1080/09500782.2012.691511

RAND Reading Study Group. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: Rand Education. Retrieved from http://www.rand.org/pubs/monograph_reports/MR1465.html

Rowsell, J. (2013). *Working with multimodality: Rethinking literacy in a digital age*. New York, NY: Routledge.

Rowsell, J., Saudelli, M. G., Scott, R. M., & Bishop, A. (2013). iPads as placed resources: Forging community in online and offline spaces. *Language Arts*, *90*(5), 351–360.

Rowsell, J., Burke, A., Flewitt, R., Liao, H. T., Lin, A., Marsh, J., . . . Wohlwend, K. (2016). Humanizing digital literacies: A road trip in search of wisdom and insight. *Reading Teacher*, *70*(1), 121–129. http://doi.org/10.1002/trtr.1501

RTI International. (2015). *Early grade reading assessment (EGRA) toolkit* (2nd ed.) Washington, DC: United States Agency for International Development. Retrieved from https://www.globalreadingnetwork.net/resources/early-grade-reading-assessment-egra-toolkit-second-edition

Santoy, J. J. (2013). Chicana bloggers: Creating diversity online via participation. *Journal of Adolescent & Adult Literacy*, *56*(5), 361–367. https://doi.org/10.1002/JAAL.155

Selwyn, N. (2010). Looking beyond learning: Notes towards the critical study of educational technology. *Journal of Computer Assisted Learning*, *26*(1), 65–73. https://doi.org/10.1111/j.1365-2729.2009.00338.x

So, H. J., Shin, C., Wong, L. S., & Lee, S. (2018). *Mobile gamification-based language learning in Mongolia: Toward a participatory learning model*. Quezon City: Foundation for Information Technology Education and Development, Inc. Retrieved from http://dl4d.org/publications-index

Spires, H., Bartlett, M. E., Garry, A., & Quick, A. H. (2012). *Literacies and learning: Designing a path forward*. Raleigh, NC: Friday Institute for Educational Innovation at North Carolina State University. Retrieved from https://www.fi.ncsu.edu/wp-content/uploads/2013/05/digital-literacies-and-learning.pdf

Spires, H. A., Kerkhoff, S. N., & Graham, A. C. K. (2016). Disciplinary literacy and inquiry: Teaching for deeper content learning. *Journal of Adolescent and Adult Literacy*, *60*(2), 151–161. http://doi.org/10.1002/jaal.577

Stornaiuolo, A., & Thomas, E. E. (2018). Restorying as political action: Authoring resistance through youth media arts. *Learning, Media and Technology*, *43*(4), 345–358. https://10.1080/17439884.2018.1498354

UNESCO. (2016). *Education 2030 Incheon declaration and framework for action for the implementation of sustainable development goal 4*. Paris: UNESCO. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000245656

UNICEF Ghana. (2017). *Risks and opportunities related to children's online practices: Ghana country report*. London: GlobalKidsOnline. Retrieved from http://

globalkidsonline.net/wp-content/uploads/2018/10/child-online-practices-Full-report-Final-Sept-10.pdf

United Nations. (2015). *Sustainable development goals*. Retrieved from https://www.un.org/sustainabledevelopment

University of Oregon, Center on Teaching and Learning. (2018). *Understanding the research behind DIBELS® 8th Edition (Technical Report 1801)*. Eugene, OR: University of Oregon, Center on Teaching and Learning. Retrieved from https://dibels.uoregon.edu/research#dibels

Wohlwend, K. E. (2009). Early adopters: Playing new literacies and pretending new technologies in print-centric classrooms. *Journal of Early Childhood Literacy*, *9*(2), 117–140. https://doi.org/10.1177/1468798409105583

World Bank. (2016). *ICT and the education of refugees: A stocktaking of innovative approaches in the MENA region—Lessons of experience and guiding principles*. Washington, DC: World Bank. Retrieved from https://openknowledge.worldbank.org/handle/10986/25172

About the Author

Michelle Schira Hagerman is Assistant Professor of Educational Technology at the University of Ottawa. Through her research, she explores the complexities of digital literacies learning and teaching. She is particularly interested in pedagogies that support synthesis of multiple Internet texts, and in the literacies that children practice during interdisciplinary Maker projects at school. An Ontario Certified Teacher, she also taught French as a Second Language for ten years in Canadian schools.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 128–136
DOI: 10.17645/mac.v7i2.1912

Article

Empowering English Language Learners through Digital Literacies: Research, Complexities, and Implications

Chang Yuan *, Lili Wang and Jessica Eagle

Teacher Education and Learning Sciences, North Carolina State University, Raleigh, NC 27695, USA; E-Mails: cyuan@ncsu.edu (C.Y.), lwang52@ncsu.edu (L.W.), jleagle@ncsu.edu (J.E.)

* Corresponding author

Submitted: 15 December 2018 | Accepted: 31 January 2019 | Published: 11 June 2019

Abstract
In the context of an increasingly global society and rapidly changing technology, English Language Learners (ELLs) need support to develop digital literacies to prepare for a future in which learning new technology is an intuitive process. In the past few decades, technological advances have been shifting how information is produced, communicated, and interpreted. The Internet and digital environments have afforded a broader range of opportunities for literacy practices to take place. Technology has transformed the social practices and definitions of literacy, which leads to transformative implications for the teaching and learning environments facing ELLs. Despite immigrants' attraction to the US, the tension between the public school system and emergent bilingual students has garnered broad attention. There is a need for a more appropriate teaching pedagogy that embraces the cultural identities of ELLs, and empowers ELLs as critical consumers and producers of information. Though complex, the authors advocate for examining this issue using an asset perspective rather than a deficit lens. Using the sociocultural perspective of learning and critical theory, this paper aims to define and conceptualize ELL learning, establish a shared vision of digital literacies, and review the literature on how practices of digital literacies empower ELLs to become active learners. In the final section, implications and future research directions are articulated in order to move the digital literacy field forward.

Keywords
critical theory; digital divide; digital literacies; English language learners

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

In the context of an increasingly global society and rapidly changing technology, English Language Learners (ELLs) need support to develop digital literacies to prepare for a future in which learning new technology is an intuitive process. Technological advances are perpetually shifting how information is produced, communicated, and interpreted. In classrooms of the past, teachers and students relied on tangible tools to access information, and practice reading, writing, speaking, and listening; in the 21st century classroom, the Internet and digital environments have afforded a broader range of opportunities for literacy practices to take place.

This emerging phenomenon has influenced how stakeholders perceive what it means to be literate in the 21st century. In the US, the Common Core State Standards Initiative (CCSS) depicts 21st century learners as strategic and capable users in the digital environment within their social practice of literacy. Students must proficiently synthesize online and offline information and wisely select digital tools (National Governors Association Center for Best Practices, 2010). Similarly, the International Society for Technology in Education (ISTE) con-

siders a student an "empowered learner, digital citizen, knowledge constructor, innovative designer, computational thinker, creative communicator, and global collaborator" (2016). Thus, technology has transformed the social practices and definition of literacy.

According to the National Center for Education Statistics ([NCES], 2018), the population of ELLs in public school increased from two million in 1990 to 4.8 million in 2015 and is expected to represent a quarter of total learners in 2025 (Capps et al., 2005). Despite immigrants' attraction to the US, the tension between the public school system and emergent bilingual students has garnered broad attention (Gándara, 2015). Data reveals that a consistent achievement gap exists between ELLs and their non-ELLs peers on standardized test scores (NCES, 2017a). Attributing this to systemic inequity, many sociocultural and critical theorists note that the "white privilege pedagogy" (Margolin, 2015, p. 1), slowly responsive teacher education programs, and the shortage of teachers of color are interwoven dynamically and therefore contribute to the status quo of ELLs (Haddix, 2016).

There is a need for a more appropriate teaching pedagogy that embraces the cultural identities of ELLs, and empowers ELLs as critical consumers and producers of information. Though complex, the authors advocate for examining this issue using an asset (Hakuta & Garcia, 1989) perspective rather than a deficit lens (Eller, 1989). Accordingly, this article proposes digital teaching pedagogies that promote digital literacies as most urgent and necessary for ELLs.

Using the sociocultural perspective of learning and critical theory, this paper aims to define and conceptualize ELL learning, establish a shared vision of digital literacies, and review the literature on how practices of digital literacies empower ELLs to become active learners. In the final section, implications and future research directions are articulated for researchers in order to move the digital literacy field forward.

2. English Language Learners in the United States

Since the end of the Cold War, the United States has become a top destination of international immigrants. As a result, in the past decades, millions of emergent bilingual students entered the US public school system and were taught by teachers who are predominantly white, English-monolingual, middle-class females (NCES, 2017b). With an intent to fuse these newcomers in the "melting pot," English-only programs are broadly implemented in the K-12 classrooms (García & Kleifgen, 2018). However, as García and Kleifgen argued, the monolingual way of teaching is leading to and reinforcing inequity in education in that emergent bilinguals are not only deprived of their cultural and linguistic assets (Boykin, Tyler, & Miller, 2005) but also encounter marginalized identities (Norton, 2016). As the achievement gap persists in the United States, finding effective ways to address the tension is emergent and urgent.

2.1. Definition of English Language Learners

Generally speaking, the term English language learners refers to learners of English as a new language or an additional language. For the purpose of discussing the disparities of academic achievement between ELLs and their native English speakers in the United States, we adopted the definition that the US Department of Education (2016) provided: English language learners are those students who are:

> Age 3–21, enrolled in elementary or secondary education, born outside of the United States or speaking a language other than English in their homes, and whose difficulties in speaking, reading, writing, or understanding the English language may be sufficient to deny the individual 1) the ability to meet the challenging State academic standards; 2) to successfully achieve in classrooms where the language of instruction is English; or 3) the opportunity to participate fully in society. (US Department of Education, 2016, p. 43)

With this "academic English" (García & Kleifgen, 2018, p. 4) focused definition, we are now able to understand, explore, and interrogate the achievement gap that occurs in classrooms locally and nationally.

2.2. The Achievement Gap between ELLs and Native English Speakers

Despite frequent discourse on the academic achievement gap in US education (Ladson-Billings, 2006), the enrollment of the K-12 ELL population continues to increase and contribute to tensions between ELLs and their native English speaking peers. According to the National Governors' Association (2017), the achievement gap is "a matter of race and class. Across the US, a gap in academic achievement persists between minority and disadvantaged students and their white counterparts" (p. 1). In a US national study quantifying the achievement gap for reading proficiency, 30.4 percent of students scored at the level of proficient or better, whereas the percentage dropped to just 5.6 among ELLs (National Assessment of Educational Progress, 2009). Although students' standardized exam scores across all races and ethnicities have steadily increased since 2015, the gaps between ELLs and non-ELLs were not eliminated (Musu-Gillette et al., 2017).

2.3. Sociocultural Perspective of Learning and Language

Prevailing in the 1960s, the deficit theory suggested that students' low achievements are due to their "pathological lifestyles [which] prohibits the study of children of color" (Coleman et al., 1966, p. 43). This early perspective was later challenged by sociocultural theorists (e.g., Cummins, 1996; Delpit, 1988; Heath, 1983) who con-

tended that the achievement gap is in fact a result stemming from complex social interactions between individuals and their surroundings such as communities, families, social institutes subjected on education. Criticizing scholars who solely view students learning and attainment as a process and result of individual cognitive ability, sociocultural researchers claim that the context and the interactive relationship between learners and the social situations are central to learning.

Rooted in Russian psychologist Lev Vygotsky's constructivist theory (1978), the sociocultural perspective of learning views social engagements as the essence which "provides the most effective and appropriate context for curriculum learning to take place" (Gibbons, 2006, p. 22). Based on this understanding, Lantolf and Thorne (2007) tailored the sociocultural theory to the field of second language acquisition (SLA) in which how to develop language learners' academic participation and interaction in the culture of schools becomes the major issue.

Many researchers and educators have studied and explored the affordances of culturally inclusive teaching in education, to whom, the multicultural background of minority learners is in fact the funds of knowledge (Moll, Amanti, Neff, & Gonzalez, 1992). Heath's longitudinal ethnographic work *Ways with Words* (1983) revealed how historical roots and social and cultural practices contributed to the so-called academic failures of the students coming from two communities, and how these failures were addressed through culturally related pedagogy (Au & Jordan, 1981; Gay, 2002) in the classroom.

2.4. Critical Theory and Its Application in English Language Learning

Maintaining "an emphasis on the social," critical lens moves further to "analyse, interrogate, challenge, and change forms of oppression and privileging of certain groups in society" (Mills, 2016, p. 36). Developed by the Frankfurt School, critical theory is an "approach to cultural criticism and social philosophy" (p. 46) that focuses on the superstructure particularly including the ideologies that shape social action, the role of dialogue and reason in social life, and a greater reflection on the system of constraints and the dialectical critique of political economy (Mills, 2016). In education, a critical orientation focuses on disrupting the reproduction of inequity in the school system, advocates the necessity of critiquing "neutrality" (Apple, Au, & Gandin, 2009), and argues for an education reconstruction (Fairclough, 1989).

From critical perspectives, ELLs are systemically positioned as the oppressed through the discourse and interactions in the English monolingual classroom. Given the power relations in schools where ELLs are "members of particular discipline-related discourse communities, and learn to control the specific registers and genres of curriculum-related subjects" (Gibbons, 2006, p. 44), researchers noticed some ELLs "participate in a…disempowered manner" (Toohey, 1999, p. 34) and argued that it is necessary to "nurture both intellect and identity equally in ways that challenge coercive power relations" (Cummins, 1996). Digital literacy practice in the classroom holds its promise in empowering ELLs.

3. Digital Literacies

3.1. An Evolving Terminology in the Context of a Digital World

It is well-acknowledged that digital literacy has become increasingly essential for individuals to be successful in living, learning and working in the context of the far-reaching digitalization of society. As a recent UNESCO Broadband Commission for Sustainable Development ([BCSD], 2017) report stated:

> Digital technologies now underpin effective participation in key areas of life and work. In addition to technology access, the skills and competencies needed to make use of digital technology and benefit from its growing power and functionality have never been more essential. (p. 4)

The field of digital literacy is continuously evolving, in response to technological advancements and the corresponding social and cultural impacts (Dore, Geraghty, & O'Riordan, 2015). Various domains contributing to the concept have resulted in a variety of terms proposed in the literature, yet reaching no consensus. Most commonly used terminology refers to digital "skills," "competencies," "aptitudes," "knowledges," "understandings," "dispositions," "thinking" (BCSD, 2017, p. 23), "fluency," "capacities," "intelligence" (Brown, 2018, p. 52), and literacies. Among these terms, skills, literacies, and competencies are most relevant and appropriate in the discussions of education in the digital landscape (Dore et al., 2015), being used interchangeably.

Literacy or literacies has been established as the most frequently used term (Dore et al., 2015) that involves the multiplicity of "knowledge, attitudes and skills" (p. 12). Taking over "online," "networked," or "computer-based" (p. 11), "digital" is used to denote information and media technology featured in many social and cultural aspects of life (Dore et al., 2015). The notion of digital literacies incorporates "basic functional digital skills" to access and use digital devices and applications, "generic digital skills" that enable users to use digital technologies in "meaningful and beneficial ways" (p. 27), alongside the "critical information literacies" (p. 32) which is part of "high level skills" (p. 30) emphasizing the capacity to critically consume information (BCSD, 2017).

The current concept of digital literacies, depending on various contributing domains and contexts, encompasses several overlapping elements of ICT literacy (ETS, 2007), information literacy (Zurkowski, 1974), media literacy (Dore et al., 2015), and visual literacy (Fransecky & Debes, 1972; Lemke, 2002).

The fluid and evolving nature of digital literacies has generated a range of definitions attempting to clarify what it means to be digitally literate since the term was conceived. For this reason, we present a brief chronology for definitions of digital literacies and highlight a framework that situates our argument for ELL empowerment.

3.2. Definitions of Digital Literacies

Paul Gilster (1997), in his book *Digital Literacy*, first published the term "digital literacy" and provided a definition as the "ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers" (p. 1). Rather than merely focusing on basic technical skills, Gilster's notion emphasized reflective competence as an essential element of digital literacy.

Digital literacies have been continuously reconceptualized as new waves of digital innovations arose with new digital features that shaped all aspects of our lives. Ferrari (2012) stated:

> Being digitally literate implies the ability to understand media (as most mediums are digitalized), to search and think critically about retrievable information (with the widespread use of the Internet) and be able to communicate with others through a variety of digital tools and applications. (p. 16)

The Battelle for Kids (2019) has described what students should develop in order to live in a technology and media-driven environment:

> People in the 21st century live in a technology and media-driven environment, marked by various characteristics, including 1) access to an abundance of information, 2) rapid changes in technology tools, and 3) the ability to collaborate and make individual contributions on an unprecedented scale. Effective citizens and workers of the 21st century must be able to exhibit a range of functional and critical thinking skills related to information, media and technology. (p. 5)

3.3. Authentic Digital Literacy Practice Within and Outside ELL Classrooms

Rooted in the "cultural heritage" and "media" ecosystem, digital literacy frameworks in the United States tend to foreground educational empowerment, enabling learners to "become more effective students, better creators, smarter information consumers, and more influential members of their community" (Alexander, Becker, Cummins, & Giesinger, 2017, p. 11).

American scholars Spires and Bartlett (2012) developed a framework that categorizes the cognitive and social processes associated with digital literacies into three components: (a) locating and consuming digital content, (b) creating digital content, and (c) communicating digital content. This framework, however, does not mean a user only focus on one component in a digital literacy activity; "in authentic digital literacy contexts, however, users traverse among these practices in a recursive manner" (p. 9). Another overarching theme is that learners should develop skepticism toward digital content, so as to proactively locate, create and communicate digital content that is credible and reliable, rather than passively receive digital information.

The characteristics of digital literacies (critical, multimodal and participatory) enable an authentic learning environment that empowers ELLs to be active participants who take student autonomy and ownership of learning, as well as developing English competencies within and outside the classroom. For instance, research by Tour (2012) revealed how the cultural contexts, critical thinking, and the operational English competencies (3D model; Durrant & Green, 2000) along with technoliteracy manifested themselves in the instruction in ELL classrooms. The study has shown that ELLs do not learn technoliteracy automatically while learning English, calling for promoting digital literacy acquisition of ELLs.

Consequently, the integration of digital literacies, as part of innovative teaching pedagogies, can be leveraged to disrupt the power dynamics of a traditional English monolingual classroom, bringing cultural inclusiveness and closing the gaps between ELLs and their native English-speaking counterparts. Drawing upon a combined framework of the aforementioned concept of educational empowerment (Alexander et al., 2017) and categorization (Spires & Bartlett, 2012) of digital literacies, the next section examines the literature on how digital literacies effectively empower ELLs in their learning and living.

4. Empowering ELLs in the United States Through Digital Literacies

For ELLs, digital literacies provide unique conditions for increasing literacy in general and is therefore an important consideration for educational equity. Barone (2006) suggested literacy gaps have a direct influence on the academic achievement gap. Digital literacies are a mediator for participation in a global technology economy. School systems have responded to such mandates by investing in the use of technology for instruction and assessment in core content areas. To ensure that students are afforded adequate classroom opportunities to acquire digital literacies, teachers are often evaluated on the extent to which they implement technology in their daily instruction. In this section, we examine how practices of digital literacies empower ELLs to become active participants in the co-creation of knowledge alongside their native English speaking peers.

4.1. Locating and Consuming Digital Content

Being able to locate and consume digital content is key to success in navigating the Internet. Part of the allure

of digital literacies is from the autonomy students are experiencing when they are navigating the wealth of information accessed using the digital interface; it is empowering to know how to and independently utilize methods for facilitating one's own inquiries. With access to the Internet, digitally literate ELLs are in a particularly powerful position to transgress the traditional roles of their native-speaking instructors and peers as authority and transmitters of information. Through the process of sifting through unreliable or irrelevant information and discerning which resources complement their purposes, language learners are also inherently free to choose to work with texts that are most appropriate for their current language proficiency (Silc, 1998). By having the ability to self-select texts, ELLs can rely less on hearsay knowledge (e.g., explanations from teachers and other students about what the text means) and, instead, have a more genuine interaction with the texts. When ELLs do not have to attend to decoding texts, they are more easily able to focus on the more complex and necessary goals of authentic academic writing: clear communication about the meanings critically derived from and synthesized across texts.

Consider how a minor change in lesson design to include digital literacy practice can foster student writing success: Al-Jarf (2002) examined writing samples of ELLs who received non-traditional writing instruction that demanded and increased digital literacies. These students were tasked with independently exploring a multitude of online resources as evidence for academic writing and were compared to students who did not. Compared to the control, treatment students became more proficient, made fewer mistakes, and communicated more easily and fluently in post-instruction essays (2002). This demonstration suggests the possibility for digital literacies to function as a key component of authentic ELL participation in the academic inquiry and writing process. While we generally understand collaboration as positive, for ELLs who do not have autonomy in navigating and selecting texts online, it may be disheartening to face a teacher-selected text and have to rely on someone else for a translation. Digital literacies can help ELLs develop independence and take ownership of their understandings.

4.2. Creating Digital Content

It is important to recognize that ELLs who are skilled at navigating sources online and selecting appropriate tools must also be supported in order to continually progress with vocabulary acquisition and command. Language, a constituent of social interaction, is necessarily used for and cultivated through veritable communication. According to Brown (2007), technology facilitates ELLs opportunities to have "genuine, meaningful communication" (p. 54) in the target language. Although an analog classroom activity incorporating only pencil-and-paper might be an appropriate platform for sharing student illustrations and orally communicating design rationales in the target language, digital communication is more likely to reflect the social environment ELLs encounter outside of school and is thus, inherently more meaningful. In two studies on the effects of the integration of Facebook to encourage writing in secondary ELL classes, the research teams concluded that the online space was highly engaging for students and provided a supportive community to facilitate positive peer reinforcement of English use (Bigelow, Vanek, King, & Abdi, 2017; Vanek, King, & Bigelow, 2018). Moreover, writers on social media platforms are typically not governed by traditional demands for adherence to formal language usage. Consequently, by using these platforms, ELLs may become more confident in their command of English and may transfer this confidence to reading and writing English in other contexts.

By bringing the digital world essential to ELL daily lives, these students can "strengthen the connections between the English language and [their own] experiences and needs" in the real world (McClanahan, 2014, p. 24). Perhaps teachers can teach digital literacies to encourage language learners to locate and safely connect with online communities centered around personally relevant topics outside of school (Omerbašić, 2015). Students are empowered as media producers as well as critical viewers, who develop their English proficiency as well as self-identity in the collaborative, contextualized, and culturally inclusive learning environment. In Danzak's (2011) study, English learners in middle school created graphic stories that explored their family identities, cultural heritage, and immigration stories. This multimedia literacy project incorporated reading graphic novels, making journals, conducting interviews, as well as combining texts with family photos and other images using computer software.

4.3. Communicating Digital Content

Educators are using Web 2.0 tools to provide new modes of communication among teachers, ELLs, and the community. Doing so engages ELLs both within and outside the classroom in authentic, intellectual projects that support and deepen understandings. Effective use of mobile devices such as cell phones and tablets affords instant communication between teachers and ELLs. Moreover, it allows ELLs to share their products with a broad audience in the online community and to have their voices heard. This authenticity in their learning process serves as a motivator for ELLs to polish and publish their work.

Considerations when selecting instructional tools and creating assignments should also be made for software capabilities. Teachers and students should locate available software online that optimizes collaboration and reduces publishing overhead. Examining the relationship of English language learners' literacy skills (reading and writing) to online and offline content producing programs, Rahimi and Yadollahi (2017) found that

the use of online software for digital storytelling was positively associated with higher Reading-Writing English test scores. Researchers selected software that helped students focus on their actual writing rather than requiring them to spend time searching for multimedia enhancements for aesthetic purposes. Thus, the online experience allows students to continuously collaborate to work through arising challenges that may present when creating content. Because of the ease in online peer-sharing, students are able to receive much more timely feedback than students who are working offline, in isolation.

Creating and sharing digital content can encourage students to develop a greater sense of pride in their work. For elementary students, digital storytelling can increase motivation by enhancing creativity (Liu, Tai, & Liu, 2018). For older students, publishing student-authored blog posts is an effective pedagogical strategy that motivates language-learners to take greater care in proofreading their writing before submission and to feel excited about others' accessing their posts (Al-Qallaf & Al-Mutairi, 2016). Experiencing positive affective responses to assignments is an incentive for students to learn.

Digital spaces that facilitate product sharing can also be a source of social empowerment for ELLs. ELLs who are digitally literate may be in a position to assist their native-speaking peers with internet navigation and software usage and may experience increased confidence. Blog posts used as a means to display academic writing knowledge can also serve language learners as a way to construct new relationships with one another and increase social capital through critical consideration of linguistic choices in anticipation of audience perceptions (Shin, 2014).

Teachers can teach digital literacies to encourage language learners to locate and safely connect with online communities centered around personally relevant topics outside of school. To illustrate, students who enjoy science fiction novels in their native language may scaffold their own target-language development by joining a wiki devoted to fan fiction. Therefore, communicating as members of an interesting online space can help facilitate students' confidence in using the lesser-known language to convey more complex ideas.

5. Complexities of the Digital Divide

Digital literacies offer unprecedented possibilities for ELLs to not only survive but thrive in the general classroom but can be limited, in practice, by the digital divide. This term has been traditionally understood as uneven "access to devices and Internet connectivity" (p. 17), but is now defined as "the disparity between students who use technology to create, design, build, explore, and collaborate and those who simply use technology to consume media passively" (Thomas, 2016, p. 18). This trend is evident in a 2018 PISA report, which suggested since 2012, with Internet access being commonplace, "socio-economically advantaged" students on average across most OECD countries reportedly spent equal or even less time online compared to disadvantaged students (Echazarra, 2018, p. 3); the traditional digital divide no longer remains.

Merely increasing the amount of the latest digital tools and digital media in classroom instruction does not guarantee effective use and quality learning outcomes. Echoed by the 2016 Pew Research Center report, digital literacies cannot empower students who merely have access to technology and digital spaces (Horrigan, 2016). In order to become digitally literate, ELLs must be expected to develop a high level of digital fluency that can provide a basis for educated discernment about how to "use technology as a tool to engage in creative, productive, lifelong learning rather than simply consuming passive content" (Thomas, 2016, p. 18). This requires effective usage guidance for classroom teachers, school curriculum, and school leadership and administration, calling for more research and actions in narrowing the digital use divide between ELLs and their native English speaking counterparts.

6. Discussion and Future Research Directions

We have established how digital literacy skills are necessitated for all by modern expectations and for ELLs in the United States by the autonomous learning and educational empowerment (Alexander et al., 2017) that results from their accessing the full potential of the Internet in order to critically evaluate information, as well as creating and communicating digital content (Spires & Bartlett, 2012). Using the sociocultural perspective of second language acquisition (Lantolf & Thorne, 2007) and an asset lens (Hakuta & Garcia, 1989), practicing digital literacies in the classroom engages ELLs to develop as active participants who gain ownership of learning and the command of English through connecting school literacy with their funds of knowledge (Moll et al., 1992). This innovative teaching pedagogy is promising in addressing tensions between an English monolingual public school system in the United States and an increasing population of K-12 ELLs the system has been facing with (Gándara, 2015) by closing the achievement gaps between ELLs and their counterparts.

To ensure all students are able to take advantage of this learning, we suggest that teachers must also possess the knowledge and skills of digital literacies. Accordingly, educational researchers should examine factors that support teachers' utilization of digital literacies. For example, scholars might consider how teachers of ELLs can engage in ongoing professional development to secure knowledge of and guidance with emerging digital tools and contexts that can be used for both content instruction and literacy learning. Moreover, how to assess multiliteracies in a meaningful way that goes beyond the evaluation of operational skills needs to be addressed in the literature (Jacobs, 2013). Additionally, it may also be beneficial to

understand the relationship of psychological characteristics, such as teacher self-efficacy and its contextual factors, with the effective deployment of online content.

At the school level, it is critical that leadership and administration can offer a supportive digital environment for both teachers and students. The ISTE Standards have foregrounded a framework for education leaders (2018) and administrators (2009) respectively when rethinking and creating "innovative" digital age learning environments. However, much research remains to be done in examining to what extent school leadership and administration 1) are aware of the importance of using technology to support teachers and ELLs; and 2) take actions to empower ELLs through digital literacies.

Conflict of Interests

The authors declare no conflict of interests.

References

Al-Jarf, R. (2002). Effect of online learning on struggling ESL college writers. *Foreign Language Annals*, *37*(1), 46–56.

Al-Qallaf, C. L., & Al-Mutairi, A. S. R. (2016). Digital literacy and digital content supports learning: The impact of blogs on teaching English as a foreign language. *The Electronic Library*, *34*(3), 522–547. https://doi.org/10.1108/EL-05-2015-0076

Alexander, B., Becker, S. A., Cummins, M., & Giesinger, C. H. (2017). *Digital literacy in higher education, part II: An NMC horizon project strategic brief* (Vol. 3/4, pp. 1–37). Austin, TX: The New Media Consortium. Retrieved from https://www.learntechlib.org/p/182086

Apple, M. W., Au, W., & Gandin, L. A. (2009). Introduction: Mapping critical education. In M. W. Apple, W. Au, & L. A. Gandin (Eds.), *The Routledge international handbook of critical education* (pp. 3–19). New York, NY: Routledge.

Au, K., & Jordan, C. (1981). Teaching reasoning to Hawaiian children: Finding a culturally appropriate solution. In *Culture and the bilingual classroom: Studies in classroom ethnography* (pp. 139–152). Rowley, MA: Newbury House.

Barone, D. (2006). *Narrowing the literacy gap: What works in high-poverty schools*. New York, NY: Guilford.

Battelle for Kids. (2019). *Framework for 21st century learning definitions*. Retrieved from http://www.battelleforkids.org/networks/p21/frameworks-resources

Bigelow, M., Vanek, J., King, K., & Abdi, N. (2017). Literacy as social (media) practice: Refugee youth and native language literacy at school. *International Journal of Intercultural Relations*, *60*, 183–197. https://doi.org/10.1016/j.ijintrel.2017.04.002

Boykin, A. W., Tyler, K. M., & Miller, O. A. (2005). In search of cultural themes and their expressions in the dynamic life. *Urban Education*, *40*, 521–549.

Broadband Commission for Sustainable Development. (2017). *Working group on education: Digital skills for life and work*. Paris: UNESCO. Retrieved from http://unesdoc.unesco.org/images/0025/002590/259013e.pdf

Brown, H. D. (2007). *Teaching by principles: An interactive approach to language pedagogy* (3rd ed.). White Plains, NY: Pearson Education.

Brown, M. (2018). Mind the gap: A critical guide to digital literacies. In G. Ubachs & L. Konings (Eds.), *The envisioning report for empowering universities* (2nd ed., pp. 52–55). Maastricht: EADTU. Retrieved from https://tinyurl.com/envisioning-report

Capps, R., Fix, M., Murray, J., Ost, J., Passel, J. S., & Herwantoro, S. (2005). *The new demography of America's schools: Immigration and the no child left behind act*. Washington, DC: Urban Institute.

Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. L. (1966). *Equality of educational opportunity*. Washington, DC: Department of Health, Education and Welfare.

Cummins, J. (1996). *Negotiating identities: Education for empowerment in a diverse society*. Los Angeles, CA: Association for Bilingual Education.

Danzak, R. L. (2011). Defining identities through multiliteracies: EL teens narrate their immigration experiences as graphic stories. *Journal of Adolescent & Adult Literacy*, *55*(3), 187–196.

Delpit, L. (1988). The silenced dialogue: Power and pedagogy in educating other people's children. *Harvard Educational Review*, *58*(3), 280–298.

Dore, L., Geraghty, A., & O'Riordan, G. (2015). *Towards a national digital skills framework for Irish higher education: Review and comparison of existing frameworks and models*. University of Limerick. Retrieved from https://www.teachingandlearning.ie/wp-content/uploads/NF-2016-Towards-a-National-Digital-Skills-Framework-for-Irish-Higher-Education.pdf

Durrant, C., & Green, B. (2000). Literacy and the new technologies in school education: Meeting the l(IT)eracy challenge? *Australian Journal of Language and Literacy*, *23*(2), 89–108.

Echazarra, A. (2018). *How has Internet use changed between 2012 and 2015? PISA in focus No. 83*. Paris: OECD Publishing. https://doi.org/10.1787/1e912a10-en

Eller, R. G. (1989). Johnny can't talk, either: The perpetuation of the deficit theory in classrooms. *The Reading Teacher*, *42*(9), 670–674.

Fairclough, N. (1989). *Language and Power*. London: Longman.

Ferrari, A. (2012). *Digital competence in practice: An analysis of frameworks*. Seville: Institute for Prospective Technological Studies, European Commission. Retrieved from http://www.ifap.ru/library/book522.pdf

Fransecky, R. B., & Debes, J. L. (1972). *Visual literacy: A way to learn—A way to teach*. Washington, DC: AECT Publications.

Gándara, P. (2015). Charting the relationship of English learners and the ESEA: One step forward, two steps back. *The Russell Sage Foundation Journal of the Social Sciences*, *1*(3), 112–128.

García, O., & Kleifgen, J. (2018). *Educating emergent bilinguals: Policies, programs, and practices for English learners*. New York, NY: Teachers College Press.

Gay, G. (2002). Preparing for culturally responsive teaching. *Journal of Teacher Education*, *53*(2), 106–116.

Gibbons, P. (2006). *Bridging discourse in the ESL classroom*. New York, NY: Continuum.

Gilster, P. (1997). *Digital literacy*. New York, NY: Wiley and Computer Publishing.

Haddix, M. (2016). *Cultivating racial and linguistic diversity in literacy teacher education: Teachers like me*. New York, NY: Routledge.

Hakuta, K., & Garcia, E. E. (1989). Bilingualism and education. *American Psychologist*, *44*(2), 374–379.

Heath, S. (1983). *Ways with words: Language, life and work in communities and classrooms*. Cambridge: Cambridge University Press.

Horrigan, J. B. (2016). Digital readiness gaps. *Pew Research Center*. Retrieved from http://www.pewinternet.org/2016/09/20/2016/Digital-Readiness-Gaps

International ICT Literacy Panel. (2002). *Digital transformation: A framework for ICT literacy*. Retrieved May 1, 2007, from Educational Testing Service website: http://www.ets.org/Media/Tests/Information_and_Communication_Technology_Literacy/ictreport.pdf

International Society for Technology in Education. (n.d.). *ISTE standards*. Eugene, OR: International Society for Technology in Education. Retrieved from https://www.iste.org/standards

Jacobs, G. E. (2013). Designing assessments: A multiliteracies approach. *Journal of Adolescent & Adult Literacy*, *56*(8), 623–626.

Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in US schools. *Educational Researcher*, *35*(7), 3–12.

Lantolf, J., & Thorne, S. L. (2007). Sociocultural theory and second language learning. *Theories in second language acquisition* (pp. 201–224). Mahwah, NJ: Lawrence Erlbaum.

Lemke, C. (2002). *enGauge 21st Century Skills: Digital Literacies for a Digital Age*. Naperville, IL: North Central Regional Educational Laboratory.

Liu, K., Tai, S. D., & Liu, C. (2018). Enhancing language learning through creation: The effect of digital storytelling on student learning motivation and performance in a school English course. *Educational Technology Research and Development*, *66*(4), 913–935. https://doi.org/10.1007/s11423-018-9592-z

Margolin, L. (2015). Unpacking the invisible knapsack: The invention of white privilege pedagogy. *Cogent Social Sciences*, *1*(1), 1–9.

McClanahan, L. (2014). Training using technology in the adult ESL classroom. Journal of Adult Education, 43(1), 22-27.

Mills, K. (2016). *Literacy theories for the digital age: Social, critical, multimodal, spatial, material and sensory lenses*. Tonawanda, NY: Multicultural Matters.

Moll, L., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory into Practice*, *31*(2), 132–141.

Musu-Gillette, L., de Brey, C., McFarland, J., Hussar, W., Sonnenberg, W., & Wilkinson-Flicker, S. (2017). *Status and Trends in the Education of Racial and Ethnic Groups 2017* (NCES 2017-051). Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved from https://nces.ed.gov/pubs2017/2017051.pdf

National Assessment of Educational Progress. (2009). *NAEP gaps*. Retrieved from https://nces.ed.gov/nationsreportcard/studies/gaps

National Center for Education Statistics. (2017a). *Status and trends in the education of racial and ethnic groups 2017*. Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2017051

National Center for Education Statistics. (2017b). *Characteristics of public elementary and secondary school teachers in the United States: Results from the 2015–16 national teacher and principal survey*. Retrieved from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2017072rev

National Center for Education Statistics. (2018). *English language learners in public schools*. Retrieved from https://nces.ed.gov/programs/coe/indicator_cgf.asp

National Governors Association Center for Best Practices. (2010). *Common Core State Standards*. Washington, DC: Common Core State Standards Initiative. Retrieved from http://www.corestandards.org/wp-content/uploads/ELA_Standards1.pdf

National Governors' Association. (2017). *Understanding the gaps: Who are we leaving behind—And how far?* Washington, DC: NEA Education Policy and Practice & Priority Schools Departments and Center for Great Public Schools. Retrieved from https://www.nea.org/assets/docs/18021-Closing_Achve_Gap_backgrndr_7-FINAL.pdf

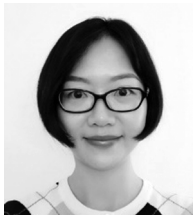
Norton, B. (2016). *Identity and language learning: Back to the future*. Vancouver: University of British Columbia.

Omerbašić, D. (2015). Literacy as a translocal practice: Digital multimodal literacy practices among girls resettled as refugees. *Journal of Adolescent and Adult Literacy*, *58*, 472–481.

Rahimi, M., & Yadollahi, S. (2017). Effects of offline vs. online digital storytelling on the development of EFL learners' literacy skills. *Cogent Education*, *4*(1).

https://doi.org/10.1080/2331186x.2017.1285531
Shin, D. (2014). Web 2.0 tools and academic literacy development in a US urban school: A case study of a second-grade English language learner. *Language and Education*, *28*(1), 68–85. https://doi.org/10.1080/09500782.2013.771653
Silc, K. F. (1998). *Using the world wide web with adult ESL learners. Center for adult English language acquisition*. Retrieved from http://www.cal.org/caela/esl_resources/digests/WWW.html
Spires, H., & Bartlett, M. (2012). *Digital literacies and learning: Designing a path forward* (Friday Institute white paper series). Raleigh, NC: The William and Ida Friday Institute for Educational Innovation.
Thomas, S. (2016). *Future ready learning: Reimagining the role of technology in education*. Washington, DC: US Department of Education.
Toohey, S. (1999). *Designing courses for higher education*. Philadelphia, PA: Open University Press.
Tour, E. (2012). Rethinking technology use in ESL education. In B. Green & C. Beavis (Eds.), *Literacy in 3D: An integrated perspective in theory and practice*. Camberwell: ACER Press.
US Department of Education. (2016). *Non-regulatory guidance: English learners and title III of the elementary and secondary education act (ESEA), as amended by the every student succeeds act (ESSA)*. Washington, DC: US Department of Education.
Vanek, J., King, K., & Bigelow, M. (2018). Social presence and identity: Facebook in an English language classroom. *Journal of Language, Identity & Education*, *17*(4), 236–254. https://doi.org/10.1080/15348458.2018.1442223
Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
Zurkowski, P. G. (1974). *The information service environment relationships and priorities* (Report no. NCLIS-NPLIS-5). Washington, DC: National Commission on Libraries and Information Science. Retrieved from https://files.eric.ed.gov/fulltext/ED100391.pdf

About the Authors



Chang Yuan is a fourth-year Doctoral Student in the TELS Literacy program in the College of Education at North Carolina State University. She received a bachelor's degree in economics from University of Western Ontario in Canada and a Master of Arts in teaching from North Carolina State University in the U.S. Her research interests include disciplinary literacy, ELL instruction, project-based inquiry, and the flipped classroom. Previously, Chang taught English and AP Economics in Beijing, China for four years.

Lili Wang is a second-year Doctoral Student in the TELS Literacy program in the College of Education at North Carolina State University. She received a bachelor's degree in Administrative Management from Ningbo University in China and a Master of Arts in English Literature from Blekinge Institute of Technology in Sweden. Her research interests include technology use in English language learning classrooms, digital literacy, new literacies, and second language acquisition. Previously, Lili taught Business English at Wenzhou University for 10 years.

Jessica Eagle is a first-year Doctoral Student in the TELS Literacy program at North Carolina State University. Her research interests include the teaching of writing, new literacies, and student affect/emotion in the literature classroom. Previously, Jessica taught English Language Arts in a North Carolina public high school. She received bachelor's degrees in English and Psychology from the University of North Carolina at Chapel Hill and a Master of Arts in English Education from Teachers College, Columbia University.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 137–147
DOI: 10.17645/mac.v7i2.1902

Article

They Need More Than Technology-Equipped Schools: Teachers' Practice of Fostering Students' Digital Protective Skills

Priscila Berger * and Jens Wolling

Department Empirical Media Research and Political Communication, Technische Universität Ilmenau, 98693 Ilmenau, Germany; E-Mails: priscila.berger@tu-ilmenau.de (P.B.), jens.wolling@tu-ilmenau.de (J.W.)

* Corresponding author

Submitted: 14 December 2018 | Accepted: 6 February 2019 | Published: 11 June 2019

Abstract
The intense use of digital media among children and adolescents raises concerns about online risks. In response, digital literacy frameworks for formal education usually include a set of protective skills. Considering that teachers have the responsibility to implement such frameworks, this study investigates factors associated with teachers' practices of fostering students' digital protective skills. Therefore, data from a survey conducted with 315 teachers in the state of Thuringia, Germany, was analyzed. The findings indicate positive associations between the importance teachers attribute to digital protective skills, the knowledge they have about guidelines for media education, their formal media training, and their media and technology use in class. Besides, the analysis revealed associations with school type, subject taught, and teacher age. Conversely, the factors of human and technological resources did not yield significant effects in the regression model. The final model explained 48% of the variance in the teachers' practices of fostering protective skills.

Keywords
digital literacy; digital skills; media education; online risk; protection of the private sphere; protective skills; teaching

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

The concept of media education developed mainly due to the perceived necessity to protect children and adolescents from potentially harmful and offensive media content. The responsibility for children's consumption of traditional media, such as television, fell mainly on parents (Buckingham, 1996; Hogan, 2001). However, new media, which is consumed primarily through handheld devices, permits a high level of individualization. Therefore, youngsters can establish contacts and consume and produce media privately. In addition to challenging regulation, the use of digital media among young people raises a myriad of concerns about online risks, such as, pedophilia, invasion of privacy, bullying, commercial exploitation, and disclosure of personal information (Livingstone, Van Couvering, & Thumim, 2004). Considering these new challenges, digital literacy frameworks for primary and secondary education have incorporated a set of protective skills, such as data protection and preservation of online identity (e.g., Ferrari, 2013; KMK, 2016).

In Germany, media education is compulsory, and its implementation is the responsibility of the federal states (KMK, 2012). The German state of Thuringia launched a media literacy program in 2009 called *Kursplan Medienkunde* to be implemented in the schools starting from the fifth grade. The program consists of a set of media-related competencies that students should develop in each school year. In an evaluation study of the *Kursplan Medienkunde*, six competency areas were identified, namely: (1) personal media use, (2) information

use, (3) media influence in society, (4) practical technology use, (5) communication, and (6) protection of the private sphere (Wolling & Berger, 2018).

Guidelines and curricula, such as the *Kursplan Medienkunde*, are usually developed at the policy level; however, the teacher has the most responsibility to implement the policies and promote media education (Brüggemann, 2013; Dias-Fonseca & Potter, 2016; UNESCO, 2008). As media educators, teachers have been recognized as influential mediators of children's safe Internet use (Kalmus, Feilitzen, & Siibak, 2012; Shin & Lwin, 2017), which suggests that it is relevant to understand the practice of fostering protective skills among young people in the classroom. In this sense, we find two central relevant topics in the existent literature: (1) the roles that teachers assume in mediating youngsters' safe Internet use, and (2) teachers' pedagogical practices involving digital technologies. In relation to the latter, several studies have investigated factors associated with teachers' adoption of technology for instruction (e.g., Agyei, & Voogt, 2011; Ertmer, 2005; Knezek & Christensen, 2016; Petko, 2012); however, there is limited research on factors associated with teachers' fostering of digital literacy education, i.e., the pedagogical practice in which digital media is the subject-matter rather than a tool. The few studies that tackle this topic aim attention at the fostering of different areas of digital skills, such as computer and information literacy (Lorenz, Endberg, & Bos, 2019; Siddiq, Scherer, & Tondeur, 2016), evaluation of digital information (Hatlevik & Hatlevik, 2018), and mediation of students' use of digital technology (Karaseva, Siibak, & Pruulmann-Vengerfeldt, 2015). To the best of our knowledge, no study has investigated the factors associated with teaching digital protective skills specifically.

Considering this research gap, this study investigates factors associated with teachers' practice of fostering students' competency in the area of "protection of the private sphere." Therefore, we analyze data collected from 315 teachers who participated in a survey on teachers' opinions and practices regarding the *Kursplan Medienkunde*. Based on these findings, this study discusses how teachers can be better prepared to foster digital competency among their students.

2. Teachers' Mediation in Safe Internet Use

When it comes to fostering youngsters' protective media skills, research has explored the roles of socialization agents in regulating and mediating children and adolescents' Internet use, especially to avoid risky behavior. For instance, based on a literature review, Tejedor and Pulido (2012) examined the risks that children were exposed to on the Internet and discussed the involvement of teachers and parents in actions that could support children's online safety. Throughout the study, the responsibilities of teachers were emphasized more than those of the parents': "the figure and role of the teacher is crucial for minors to reach a critical, analytical and qualitative use of the Internet" (p. 67). Nevertheless, Livingstone Haddon, Görzig and Ólafsson (2011) showed that online safety advice is received primarily from parents, followed by teachers, and then from peers, based on a survey of children between nine and 16 years of age and their parents in 25 European countries. However, this rank changes according to demographics. For example, older teenagers and children with lower socioeconomic status reported receiving advice primarily from teachers. Using the same data, Kalmus, Feilitzen, and Siibak (2012) showed a positive relationship between teacher mediation and children's digital literacy and safety skills. However, teachers' mediating practice of helping children with something that bothered them on the Internet correlated negatively with skills, suggesting that less-skilled children might rely more on teachers for online safety guidance.

Jiménez-Iglesias, Garmendia-Larrañaga, and Casado-del-Río (2015) also found that parents and teachers are the main mediation agents for children's Internet use. In their qualitative analysis of focus groups and in-depth interviews with children aged nine to 16 years in Spain, the authors found that teachers are perceived as regulatory agents similar to parents and are expected to intervene in conflicts that happen at school. Similarly, Shin and Lwin (2017) showed that teachers were perceived to share a similar role to that of parents in certain types of mediations. In a survey of 746 adolescents between the ages of 12 and 18 years in Singapore, parents and teachers were considered influential agents in terms of advising on the adequacy of websites, what can and cannot be shared online, and how to proceed when someone bothers them on the Internet. However, teachers were perceived as the primary agent when it comes to suggesting ways to use the Internet safely.

These studies, conducted from the perspective of students, show that teachers play a meaningful role in guiding youngsters on how to use the Internet safely. However, to the best of our knowledge, there is a lack of research from the perspective of teachers, which would help to clarify the practice of fostering students' digital protective skills.

3. Teaching Practices with Digital Technologies

Among the teaching practices with digital technologies, the use of information and communication technologies (ICT) for instruction has received the most attention from researchers. While the use of ICT in class can be associated with a teacher's engagement in the fostering of media-related literacies (Hatlevik & Hatlevik, 2018; Lorenz et al., 2019; Siddiq, Scherer, & Tondeur, 2016), the two practices are not always synonyms. The adoption of ICT in class can facilitate learning about media, but it does not automatically correspond with a teacher's intention to foster media literacy. In most cases, the adoption of ICT in class aims to enhance the learning goals of other subjects (John, 2005), although students might develop media skills as a side effect. In the particular case

of digital protective skills, it is unreasonable to assume that the mere use of ICT would lead to the development of such competency. The practice of fostering students' digital protective skills goes beyond the adoption of technology for teaching. Therefore, this study aims to answer the following research question:

> RQ: How can teachers' practice of fostering students' digital protective skills be explained?

3.1. Explaining the Practice of Fostering Digital Skills

To develop a research model to answer our research question, we referenced studies that investigated teaching practices that used technology, especially the ones that revealed factors associated with promoting ICT skills among young people. As described below, we identified potential predictors and generated hypotheses from the results of these studies.

3.1.1. Beliefs and Attitudes

Teachers' beliefs about teaching and learning are one of the most influential factors affecting their decision to use ICT in the classroom (Ertmer, 2005) because "acceptance of the value and worth of technology is a critical component" of the adoption of technology (Knezek & Christensen, 2016, p. 311). Research indicates that a favorable perception of the use of ICT in class is also an influential factor of teachers' efforts to promote digital skills among their students (Karaseva, Siibak, & Pruulmann-Vengerfeldt, 2015; Lorenz et al. 2019; Siddiq et al., 2016). Our study does not measure the perceived relevance of ICT use in general, but rather focuses on teachers' perception of the importance of learning protective skills. Therefore, if a teacher believes in the importance of fostering protective skills among their students, we hypothesize:

> H1. The level of importance teachers attribute to student learning of protective skills is positively associated with the practice of fostering students' protective skills.

3.1.2. Knowledge of Media Education Guidelines

Studies show that a teacher's self-efficacy in ICT is positively related to fostering students' digital skills (Hatlevik & Hatlevik, 2018; Siddiq et al., 2016). ICT self-efficacy was not measured in the survey of teachers in Thuringia. However, we assume that understanding the state and national guidelines for media education, including the *Kursplan Medienkunde*, gives teachers a more solid idea of the topics that are involved in media literacy and what skills students should develop. Therefore, we hypothesize that these guidelines contribute to teachers feeling more prepared to foster students' digital skills in their practice:

> H2. Teachers' knowledge of plans and guidelines for media education is positively associated with their practice of fostering students' protective skills.

3.1.3. Training

In order for media literacy initiatives to be successful in schools, it is necessary for teachers to prepare via pre-service and in-service training (UNESCO, 2008; Wilson, Grizzle, Tuazon, Akyempong, & Cheung, 2011). It is assumed that receiving pre-service and in-service training for teaching with and about media has positive effects on the practice of fostering students' digital skills. However, until now, neither universities nor institutions in Germany that offer in-service training have included media-related topics sufficiently in their curricula (Tiede & Grafe, 2016). Consequently, only a minority of teachers are prepared to teach media competency through their studies or by official institutions. Due to the lack of formal preparation, most teachers must acquire the needed knowledge and skills autonomously. It remains unclear whether teachers' autonomous learning of media-related issues has positive effects on the practice of media education. Contrarily, it seems plausible that instructors who rely predominantly or even completely on autonomous learning feel less confident and have a less solid idea of how to teach media-related subjects than those who receive formal preparation. Therefore, we assume:

> H3. Teachers who must rely on autonomous learning foster students' protective skills less, while teachers with formal training on how to teach with and about media engage more in fostering digital protective skills among their students.

3.1.4. School Resources

It is important to consider that official and autonomous trainings are not the only ways that teachers can develop their digital capabilities. For instance, exchanging knowledge and ideas with colleagues can help teachers shape their practices with digital technologies (Ertmer, 2005). Lorenz et al. (2019) found that school support had a positive effect on teachers' fostering of students' computer and information skills by encouraging collaboration with colleagues and providing materials to develop ICT-based lessons. Even though Hatlevik and Hatlevik (2018) did not find a significant direct association between collegial collaboration and fostering students' skills in terms of evaluating digital information, collaboration between colleagues was significantly associated with teachers' ICT use in class, as well as their confidence in doing so.

We believe that other resources, aside from collaboration, could affect teachers' efforts to teach digital protective skills. For example, Lorenz, Endberg and Eickelmann (2016) found that having time to prepare lessons that integrate ICT was a positive predictor of

technology integration in class. We believe that having the time to adapt lessons to accommodate the instruction about media could be an especially valuable resource for teachers in Thuringia, considering that the German guidelines for media education determine that the instruction about digital protective skills must happen within the realm of traditional school subjects (KMK, 2012). Moreover, research has indicated that the availability of sufficient ICT resources at school is a fundamental condition for teachers to involve digital technologies in their practices (Gil-Flores, Rodríguez-Santero, & Torres-Gordillo, 2017; Lorenz et al., 2019; Petko, 2012). Although it is possible to promote students' protective skills without the presence of ICT in class, we argue that teachers can identify more opportunities to foster students' media literacy when they have the necessary ICT resources available at the school. Considering the human and technological resources mentioned above, we hypothesize that:

> H4: Teachers' evaluation of school resources is positively related to their practice of fostering students' protective skills.

3.1.5. ICT Use

Besides the availability of resources, it is relevant to consider the extent to which teachers use them in their instruction. Studies have found that teachers' ICT use in class is positively associated with their practice of fostering digital skills (Hatlevik & Hatlevik, 2018; Lorenz et al., 2019; Siddiq et al., 2016). Therefore, we expect that ICT use will be associated with the practice of promoting protective skills:

> H5. The intensity of teachers' use of ICT in class is positively related to their practice of fostering students' protective skills.

3.1.6. Subject, Age, and School Type

Considering that the *Kursplan Medienkunde* should be integrated into traditional school subjects, it is reasonable to argue that the teaching of protective skills might fit better within the content of certain subjects. John (2005) elaborated on the integration of technology-related innovations in teachers' practice, indicating a complex negotiation process between their specific subject pedagogy and using ICT. While the integration of ICT generates changes and adaptations in the pedagogy, the original goals established in the subject shape, accommodate, and limit innovations during instruction. Regarding subject areas, studies have shown that science teachers tend to exhibit more positive pedagogical practices and attitudes toward technology than other teachers (Claro et al., 2018; Karaseva, Siibak, & Pruulmann-Vengerfeldt, 2015), whereas Siddiq et al. (2016) found that humanities, languages, and arts teachers put greater emphasis on fostering students' computer and information literacy. In our analysis, we explore the possible relationships between various subjects and teachers' practices of fostering students' protective skills. We also include age in an exploratory character. Finally, we explore the relationship between the type of school and the extent to which teachers promote protective skills. Therefore, we state the following sub-research question:

> SRQ: What are the associations between teachers' school types, subjects taught, ages, and practices in terms of fostering students' protective skills?

4. Methods

4.1. Sample

We tested our hypotheses using data collected from a teacher survey conducted in Thuringia, a federal state of Germany, in the summer of 2017. The sample was recruited through a random selection of 88 schools out 448 in which the *Kursplan Medienkunde* applies. We contacted the heads of the schools and asked them to distribute the questionnaire among the teachers in their schools, making it possible to reach more than 2700 teachers. The teachers had the option to fill out the questionnaire online via a link to the survey or by paper and pencil since copies of the questionnaire were sent to the schools along with a pre-stamped return envelope. Astonishingly, only 40% of the teachers answered online. After several reminder e-mails, 315 teachers participated in the survey (response rate of 12%). The analysis of the data shows that the majority of the participating teachers (84%) were directly engaged in teaching aspects of the *Kursplan Medienkunde*, while based on the information that we got from the head of the schools, an average of only 40% were involved with media education. Therefore, a self-selection process took place, and the sample consisted of teachers who were somehow involved or at least interested in the topic of media education. Nevertheless, the sample is quite similar to the population of teachers in Thuringia in terms of socio-demographic and structural characteristics. Table 1 shows that the percentage of female teachers is considerably higher in the sample and the general population. The distribution of age is quite similar, as well. Moreover, the proportion of teachers distributed throughout different school types in the sample is close to the teaching staff in the state. Therefore, the sample can be considered representative of teachers in Thuringia.

4.2. Measures

As mentioned in the introduction, this paper explains what associates with teachers' practice of the competency area "protection of the private sphere" in the *Kursplan Medienkunde*. To achieve this goal, we developed items based on the descriptions of the competency

Table 1. Comparison of sample characteristics and distributions in the basic population (Statistisches Informationssystem Bildung, 2019).

Characteristics		Sample	Basic Population (Teachers in Thuringia)
Age	Up to 34 years	16%	11%
	35 to 44 years	10%	8%
	45 to 54 years	37%	39%
	55 years and older	38%	41%
Gender	Female	72%	78%
	Male	28%	22%
School type	Gymnasium	36%	33%
	Standard school	41%	32%
	Other schools	22%	35%

areas provided by the *Kursplan Medienkunde*. Four indicators measured the dimension of protective skills. The teachers were asked to report how frequently (1 = never to 5 = often) they had instructed their students over the past year on the following topics: (1) how to handle cyber-bullying appropriately, (2) how to surf the Internet safely, (3) how to protect their data and private sphere effectively, and (4) how to detect when personal data has been collected and processed in network-media. These four items are strongly correlated (between $r = 0.56$ and 0.80) and comprise an exceptionally reliable scale ($\alpha = 0.89$).

The first explanatory factor is the perceived importance of the competency. The same four items as the outcome variable were applied to operationalize this factor, but with different introductory questions and answers. The teachers were asked to judge the importance of the four aspects on a scale from 1 (not important) to 5 (particularly important). The four items that measure importance were less correlated (between $r = 0.27$ and 0.53) and the reliability of the scale was lower ($\alpha = 0.70$) compared to the variable that represents fostering protective skills.

The second explanatory factor is topic-related knowledge and the preparation of each teacher. Media education includes a broad field of skills and knowledge. On that account, measuring the respective knowledge of the teachers is a demanding task that cannot be thoroughly addressed by simple indicators. All measures are only rough approximations. Therefore, we decided to apply two approaches: The first refers to teachers' knowledge of media literacy education, as it relates to the syllabus. In Thuringia, this syllabus is comprised of four documents with various levels of concreteness. To measure this concept, we asked teachers how familiar they were with these documents on a scale from 1 (not at all) to 5 (very well). The four variables compose a reliable scale ($\alpha = 0.77$).

The second knowledge indicator relates to sources of topic-related skills. We asked teachers how they obtained the necessary skills to teach media literacy. We differentiated between formal preparation (pre-service studies and in-service training) and autonomous acquisition of skills. Four different competencies were considered: (1) critical deliberation of media use, (2) teaching students how to use media deliberately, (3) teaching students how to use media competently, and (4) dealing appropriately with cyber-bullying. Based on these four measures, we created a scale from −4 (teacher obtained all four skills autonomously) to +4 (teacher obtained all four skills through formal training).

The third influence factor refers to the resources available at the school. Once more, we considered two different approaches. First, we asked teachers how they would evaluate the quality and quantity of the resources available in their schools. A scale from 1 (not existent) to 6 (very good) was applied. Ten aspects were evaluated, six of which referred to human resources (e.g., support by colleagues and school principal, available time for further education and preparation) and four related to technological resources (e.g., quality and quantity of technical hardware, software, and Internet access). A factor analysis confirmed that the two aspects were discriminable dimensions of evaluation and both scales showed high reliability (human resources: $\alpha = 0.88$, technological resources: $\alpha = 0.92$).

The ICT use indicator operationalizes the intensity of digital media use during instruction. On a scale from 1 (never) to 5 (several times per week), the instructors reported how frequently they used four different types of computer programs (word processing, spreadsheets, presentations, and serious games), four different types of online resources (websites, search engines, online videos, and online communication), and four different types of hardware (computer-labs, interactive whiteboards, data projectors, and laptops) in the classroom. These twelve variables were averaged to build a composite scale ($\alpha = 0.89$).

Concerning school type, we differentiated between gymnasium, which is a secondary school in Germany that focuses on preparation for entering university (score of 1), and all other schools (score of 0). Regarding the

subject areas, we asked the teachers to identify the subject areas where they have integrated media-related topics. It is unreasonable to address the "protection of the private sphere" in all subjects, and while this topic involves ethical, legal, and social concerns, it also requires technical understanding. Therefore, we identified the following 10 subjects in the areas of humanities, languages and informatics that might be relevant to this competency: (1) German, (2) geography, (3) history, (4) ethics, (5) economy and law, (6) economy and environment, (7) informatics, (8) religion, (9) social studies, and (10) humans, nature, and technology. Teachers who instruct at least one of these subjects were coded as 1, and the others were coded as 0.

5. Findings

The descriptive findings of our analysis already reveal some important insights (Table 2). The dependent variable measures how frequently teachers address the topic of "protection of the private sphere" in the classroom. The index indicates that the mean activity of teachers in this area was 3.3 (SD = 0.95) on a scale from 1 (never) to 5 (often). In contrast to the reported practice, the attributed relevance of competency is much higher. On a scale from 1 (not important) to 5 (particularly important), it achieved a value of 4.5.

Concerning the indicators for knowledge and formal preparation, the results show that teachers in Thuringia rely mostly on the autodidactic acquisition of media education competency since formal education does not offer many opportunities in this area. A mean of −1.5, on a scale from −4 (teacher obtained all four skills autonomously) to +4 (teacher obtained all four skills through formal training) indicates that autodidactic acquisition plays a more prominent role than formal training (SD = 1.8). Furthermore, the results show that on average, the teachers perceived their knowledge on the relevant documents to be better than regular (M = 3.2, on a scale from 1 to 5).

The teachers also rated the perceived availability of human and technological resources as regular. Human resources were evaluated better (M = 3.8) than technological resources (M = 3.6), on a scale from 1 (not existent) to 6 (very good). Moreover, the level of digital media use was an average of 2.8 (SD = 0.89), which is close to the middle of the scale (1–5).

Regarding the other control variables, we found that 36% of instructors in our sample work at a gymnasium and 67% teach subjects that have at least some potential to address aspects related to the "protection of the private sphere."

Bivariate correlations and hierarchical regression analyses were conducted to test the five hypotheses and to answer the sub-research question concerning the influence of school-type, subject, and age of the teachers. The correlation analysis shows significant relationships between all independent variables and the target variable (Table 3). Therefore, all variables were included in the regression analysis (Table 3, Model 1). The results from the first regression model confirm the bivariate relationships with two exceptions. The positive effect of human and technological resources vanished when we controlled for the other factors. Therefore, these two factors were excluded, and the regression was calculated again (Table 3, Model 2). After eliminating these two variables, the final model contained only significant factors and successfully explained a considerable part of the variance (almost 50%).

The first hypothesis (H1)—the level of importance that teachers attribute to student learning of protective skills is positively associated with their practice of fostering students' protective skills—was strongly supported by the data. The teachers perceived this skill to be important, and it had a significant and positive effect on their practice. Likewise, the second hypothesis (H2) that assumed a positive relationship between the teachers' knowledge of plans and guidelines for media education was also confirmed by the data. However, the impact of knowledge was considerably lower compared with attitudes. Also the second hypothesis related to knowledge (H3), which predicts a positive relationship between teachers' formal training in media, was also proven by the analysis; while formal training strength-

Table 2. Descriptive results.

	Scale	M/%	SD	n
Dependent variable				
Protection of the private sphere (Index: four items)	1 to 5	3.29	0.95	314
Independent variables				
Importance given to competency (Index: four items)	1 to 5	4.51	0.45	313
Knowledge of plans (Index: four items)	1 to 5	3.24	0.88	313
Formal vs. autonomous training (Index: four items)	−4 to +4	−1.47	1.80	315
Technological resources (Index: six items)	1 to 6	3.63	1.17	307
Human resources (Index: six items)	1 to 6	3.82	1.10	310
ICT use in class (Index: 12 items)	1 to 5	2.81	0.89	313
Type of school (gymnasium yes/no)	1/0	36%		307
Relevant subjects (yes/no)	1/0	67%		315

Table 3. Results of bivariate correlations and hierarchical regression analyses.

Predictors	Bivariate Correlation	Model 1	Model 2
Competency area: protection of the private sphere	*r*	*beta*	*beta*
Importance given to competency	0.38***	0.30***	0.30***
Knowledge of plans	0.47***	0.16**	0.16**
Formal vs. autonomous training	0.12*	0.11*	0.11*
Technological resources	0.13*	(–0.02)	—
Human resources	0.23***	(0.03)	—
ICT use in class	0.46***	0.35***	0.35***
Kind of school: gymnasium	–0.23***	–0.17***	–0.17***
Relevant subjects	0.25***	0.09#	0.10*
Age	0.24***	0.14*	0.15**
R^2		0.49	0.48
F		27.57***	35.73***
Durbin-Watson		1.94	1.94
N		272	275

Notes: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; # $p < 0.10$.

ened teachers' engagement in fostering protective skills, we found that relying on autonomous learning had the opposite effect.

The fourth hypothesis (H4) assumed that the better the teachers evaluated the school resources, the more they would foster students' protective skills. However, the data did not support this assumption: neither human nor technological resources seem to be associated with teachers' engagement when the model includes other predictors. However, the indicator that represents the use of resources had the strongest effect (*beta* = 0.35) on the outcome variable. Therefore, the last hypothesis (H5) "the intensity of teachers' use of ICT in class is positively related to their practice of fostering students' protective skills" was confirmed. In terms of our sub-research question, we found that instructors teaching in gymnasium placed less emphasis on fostering students' protective skills, and the subjects identified as relevant for fostering protective skills yielded a small positive and significant effect. Finally, the findings suggest that older teachers invest more in fostering students' digital protective skills.

6. Discussion

This study aimed to determine what factors were associated with teachers' practice of fostering students' digital protective skills. The findings of our analysis supported most of our hypotheses. The exception was the positive relationship that we expected to exist between resources and fostering protective skills, which was rejected. Considering only bivariate correlations, it is possible to see a small but significant positive association, especially with human resources. However, when controlling for other factors, resources lost their significance. Similarly, in Hatlevik and Hatlevik's (2018) work, collegial collaboration was found to have no direct effect on fostering students' digital information skills. However, their analysis showed that collegial collaboration was significantly associated with self-efficacy and ICT use, which had a significant effect on teaching digital skills. Therefore, we do not discredit the importance of school support for teachers' practice of fostering protective skills among their students. We believe these findings suggest a more complex relationship exists between the following three elements: (1) external conditions for teachers' practice, such as resources, (2) teachers' agency (i.e., attitudes, ICT adoption, and confidence), and (3) teachers' practice of fostering digital skills. Moreover, the area of digital literacy emphasized in the teaching might mediate the effect of teachers' perception of school resources on their practice of teaching media-related skills. For instance, Lorenz et al. (2019) identified a direct relationship between school support and teachers' practice of fostering skills in the area of computer and information literacy. Meanwhile, Hatlevik and Hatlevik (2018), who analyzed the area of evaluating digital information, and our study that focused on the area of digital protective skills found no direct associations with school resources.

Regarding technological resources specifically, teachers' actual use of available resources yielded the strongest effect, even though the perceived availability of resources did not deliver a significant result in our analysis. When teachers employ the available technologies in their activities, the probability that they will also engage in teaching protective skills rises significantly. Obviously, teachers cannot use what they do not have available. Nonetheless, it is possible that resources provided at school go unused (Knezek & Christensen, 2016). In this sense, while the availability of resources is a fundamental condition for use, teachers' engagement with technology has a stronger effect on teaching about digital protective skills.

According to previous research, teachers' beliefs about the relevance of ICT for teaching and learning determine whether teachers will use the resources provided at their schools (Ertmer, 2005; Lorenz et al., 2016;

Petko, 2012; Siddiq et al., 2016). Our findings show that teachers' attitudes are a relevant factor for teaching digital protective skills, as well. When teachers consider "protection of the private sphere" to be important, they make a stronger effort to foster it. The descriptive findings showed that the perceived relevance of protective skills is already high among the sample. However, some teachers still do not attribute high relevance to the subject. Therefore, it is imperative to make teachers conscious of the importance of digital protective skills, as well as of their roles as mediators of youngsters' safe Internet use (Kalmus, Feilitzen, & Siibak, 2012; Shin & Lwin, 2017).

Concerning the role of knowledge, we found that it is meaningful to inform teachers about the goals of media education because those who know about the guidelines tend to integrate the issue into their classroom activities. In terms of teacher training, we must acknowledge that it is problematic to expect teachers to obtain the necessary knowledge and skills through autodidactic means. The findings show that only formal preparation has a positive effect on teaching practice. Guidelines and official training (pre-service and in-service) might help teachers understand the priorities of media education, what content should be taught, and how media-related topics could be integrated into traditional school subjects. In-service and pre-service training would also show teachers how to incorporate ICT into the classroom meaningfully and encourage its use, while simultaneously promoting the importance of teaching protective skills.

In addition to the stated hypotheses, this study explored relationships between the type of schools where teachers work, the subjects they teach, their ages, and the practice of fostering students' protective skills. The results show a lower incidence of practice among gymnasium teachers. The reason for this result could be that gymnasium focuses on preparing students for university; therefore, teachers tend to have a more focused curriculum with little room for topics that do not fall under the criteria for admission. Moreover, high social selectivity has been demonstrated in the German school system (Müller & Ehmke, 2013). Students who live in high socioeconomic conditions are five times more likely to be recommended to attend gymnasium than children from lower-income families (Wernstedt & John-Ohnesorg, 2008). Moreover, previous studies show that children with lower socioeconomic status tend to rely more on teachers for advice on safe Internet use (Livingstone et al., 2011); therefore, teachers who work in non-gymnasium schools might assume higher responsibility for fostering students' protective skills.

The findings also showed that protective skills were facilitated through specific school subjects. Our analysis showed that subjects in the areas of languages, humanities, and informatics were more favorable for integrating media protective skills. This result is partly in line with the findings of Siddiq, Scherer and Tondeur (2016), but does not coincide with the results of Claro et al. (2018) who found that science teachers had greater ability to instruct students on digital tasks. However, it is crucial to highlight that Claro et al. analyzed the ability of teachers to convey digital tasks rather than their actual teaching practices. When it comes to practice, specific subjects and characteristics of the school curriculum facilitate the practice and others hinder it, even if the teacher has the ability to teach digital skills.

The difference between ability and practice also appears in the aspect of age. Our findings indicate that older teachers tend to foster students' protective skills more, while in the study by Claro et al. (2018), younger teachers showed more skills in teaching digital literacy. However, Claro et al. also reveal that teachers with more experience exhibit higher ability. In this sense, the positive association that we found between age and fostering protective skills might be related to the time they have spent in service rather than their age. Moreover, it is valid to consider the specific characteristics of teachers in Thuringia, which is the population of our study. First, the average age of teachers in this German federal state for the 2017–2018 school year was 50.3 years (Statistisches Informationssystem Bildung, 2019). Second, most of these teachers were born and raised in the former German Democratic Republic. Therefore, it is plausible to assume that the topic of "protection of the private sphere" could be especially sensitive for older teachers who lived under constant observation by the state. This sensitivity could affect the importance they give to protective skills in the digital context.

Our findings show that the practice of fostering students' digital protective skills is connected mainly to teachers' agency, i.e., their attitudes toward the importance of the topic and their use of technology. Therefore, to stimulate teachers in their roles as mediators for safe online practices among young people, investments should promote and facilitate these factors. Germany is currently considering a digital pact ("*DigitalPakt Schule*") that would increase investments in technological equipment and infrastructure in schools. Our findings suggest that the mere existence of technology is not enough for teachers to promote digital protective skills. However, guidelines for media education and teacher training about media have the potential to shape and stimulate this practice. We believe that training could successfully raise teachers' awareness about the relevance of the topic and their roles as media educators. Therefore, it is imperative that the investments planned within the German digital pact enhance teacher training and provide guidelines, goals, and regulations for media education. Furthermore, instead of expecting or demanding that all teachers promote digital protective skills, it is reasonable to direct efforts to teachers in subjects and types of schools that are more relevant to this practice. Thus, the training initiative should prioritize specific subjects, such as humanities and informatics, as well as schools that have a higher concentration of students with lower socioeconomic status.

6.1. Limitations and Future Research

While our study included predictors that have not been analyzed in previous literature, namely knowledge of guidelines and training, our analysis might not have analyzed sufficiently the complexity of factors that surround teaching practices that foster digital skills. A path analysis and structural equation modeling might be more suitable for identifying the direct and indirect relationships between factors.

Previous studies identified the role that teachers' self-efficacy plays in fostering digital skills. While we offered a unique perspective of skills, including knowledge of plans and guidelines of media education, as well as in-service and pre-service training, we had no available measures of how prepared teachers feel to convey digital protective skills. This is a shortcoming of our study, especially considering that 60% of our sample chose to answer the survey with pen and paper instead of the online version, which might suggest a lack of confidence with digital tools. Future studies should include measures of self-efficacy, knowledge of guidelines, and level of training to investigate the relationships between these factors, as well as how their interactions affect the practice of fostering digital skills.

Moreover, our study took place in a specific context, which was the federal state of Thuringia, Germany. Since the federal states are responsible for media education in Germany, it is important to conduct studies that compare the practice of digital literacy in different states. Moreover, the study has a self-selection bias. Although the survey was aimed at all teachers, 84% of respondents reported fostering at least one of the six areas of the *Kursplan Medienkunde*. Therefore, we need to consider that our results come predominantly from a biased sample of teachers who are involved in the topic of media literacy. Consequently, our results might have shown a more negative picture regarding resources, attitudes, and all other components, if more teachers unrelated to media education had participated.

Most results of this study are in line with previous studies that investigated other areas of digital skill, confirming factors that play a role in the practice of fostering digital competency. On the other hand, it also identified associations between factors that have not been investigated before. Therefore, this study contributes to the development of a more comprehensive model that explains teachers' practice of media literacy. Future studies should test the model presented in this paper with other competency areas to identify factors that apply to the practice of fostering students' digital literacy in general, and factors that are specific to particular competency areas.

Acknowledgments

The project was financed and supported by the Ministry of Education, Youth and Sports of Thuringia (*Thüringer Ministerium für Bildung, Jugend und Sport*). We acknowledge support for the Article Processing Charge by the German Research Foundation (DFG) and the Open Access Publication Fund of the Technische Universität Ilmenau.

Conflict of Interests

The authors declare no conflict of interests.

References

Agyei, D. D., & Voogt, J. M. (2011). Exploring the potential of the will, skill, tool model in Ghana: Predicting prospective and practicing teachers' use of technology. *Serious Games*, *56*(1), 91–100. https://doi.org/10.1016/j.compedu.2010.08.017

Brüggemann, M. (2013). *Digitale Medien im Schulalltag: eine qualitativ rekonstruktive Studie zum Medienhandeln und berufsbezogenen Orientierungen von Lehrkräften* [Digital media in the school reality: A qualitative reconstructive study of media management and teachers' professional orientation]. München: Kopaed.

Buckingham, D. (1996). *Moving images: Understanding children's emotional responses to television*. Manchester: Manchester United Press.

Claro, M., Salinas, A., Cabello-Hutt, T., San Martín, E., Preiss, D. D., Valenzuela, S., & Jara, I. (2018). Teaching in a digital environment (TIDE): Defining and measuring teachers' capacity to develop students' digital information and communication skills. *Computers & Education*, *121*, 162–174. https://doi.org/10.1016/j.compedu.2018.03.001

Dias-Fonseca, T., & Potter, J. (2016). Media education as a strategy for online civic participation in Portuguese schools. *Comunicar*, *24*(49), 9–17. http://dx.doi.org/10.3916/C49-2016-01

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, *53*(4), 25–39. https://doi.org/10.1007/BF02504683

Ferrari, A. (2013). *DIGCOMP: A framework for developing and understanding digital competence in Europe* (JRC Scientific and Policy Reports No. EUR 26035). Luxembourg: Publications Office of the European Union.

Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J.-J. (2017). Factors that explain the use of ICT in secondary-education classrooms: The role of teacher characteristics and school infrastructure. *Computers in Human Behavior*, *68*, 441–449. https://doi.org/10.1016/j.chb.2016.11.057

Hatlevik, I. K. R., & Hatlevik, O. E. (2018). Students' evaluation of digital information: The role teachers play and factors that influence variability in teacher behavior. *Computers in Human Behavior*, *83*, 56–63. https://doi.org/10.1016/j.chb.2018.01.022

Hogan, M. J. (2001). Parents and other adults: Models

and monitors of healthy media habits. In D. Singer & J. Singer (Eds.), *Handbook of children and the media* (pp. 663–680). London: Sage Publications.

Jiménez-Iglesias, E., Garmendia-Larrañaga, M., & Casado-del-Río, M. A. (2015). Percepción de los y las menores de la mediación parental respecto a los riesgos en Internet [Kids' perceptions of parental mediation concerning internet risks]. *Revista Latina de Comunicación Social*, *70*, 49–68.

John, P. (2005). The sacred and the profane: Subject sub-culture, pedagogical practice and teachers' perceptions of the classroom uses of ICT. *Educational Review*, *57*(4), 471–490. https://doi.org/10.1080/00131910500279577

Kalmus, V., von Feilitzen, C., & Siibak, A. (2012). Effectiveness of teachers' and peers' mediation in supporting opportunities and reducing risks online. In S. Livingstone & L. Haddon (Eds.), *Children, risk, and safety on the Internet: Research and policy challenges in comparative perspective* (pp. 245–256). London: Policy Press.

Karaseva, A., Siibak, A., & Pruulmann-Vengerfeldt, P. (2015). Relationships between teachers' pedagogical beliefs, subject cultures, and mediation practices of students' use of digital technology. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, *9*(1). http://dx.doi.org/10.5817/CP2015-1-6

KMK. (2012). *Medienbildung in der Schule—Beschluss der Kultusministerkonferenz vom 8. März 2012* [Media education at school—Resolution of the Kultusministerkonferenz from 8. March 2012]. Retrieved from http://www.kmk.org/fileadmin/Dateien/veroeffentlichungen_beschluesse/2012/2012_03_08_Medienbildung.pdf

KMK. (2016). *Bildung in der digitalen Welt: Strategie der Kultusministerkonferenz* [Education in the digital world: Strategy of the Kultusministerkonferenz]. Berlin: Sekretariat der Kultusministerkonferenz.

Knezek, G., & Christensen, R. (2016). Extending the will, skill, tool model of technology integration: Adding pedagogy as a new model construct. *Journal of Computing in Higher Education*, *28*(3), 307–325. https://doi.org/10.1007/s12528-016-9120-2

Livingstone, S., Haddon, L., Görzig, A., & Ólafsson, K. (2011). *Risks and safety on the Internet: The perspective of European children*. Full Findings. London: EU Kids Online.

Livingstone, S., Van Couvering, E., & Thumim, N. (2004). *Adult media literacy: A review of the research literature*. London: Ofcom.

Lorenz, R., Endberg, M., & Bos, W. (2019). Predictors of fostering students' computer and information literacy—Analysis based on a representative sample of secondary school teachers in Germany. *Education and Information Technologies*, *24*(1), 911–928. https://doi.org/10.1007/s10639-018-9809-0

Lorenz, R., Endberg, M., & Eickelmann, B. (2016). Unterrichtliche Nutzung digitaler Medien von Lehrkräften der Sekundarstufe I in Deutschland und im Bundesländervergleich [Teachers' classroom use of digital media in secondary school in Germany and the federal states in comparison]. In W. Bos, R. Lorenz, M. Endberg, B. Eickelmann, R. Kammerl, & S. Welling (Eds.), *Schule digital—Der Länderindikator 2016: Kompetenzen von Lehrpersonen der Sekundarstufe I im Umgang mit digitalen Medien im Bundesländervergleich* [Digital school—The Länderindikator 2016: Teachers' competencies in use of digital media in secondary school in the federal states] (pp. 80–109). Münster: Waxmann.

Müller, K., & Ehmke, T. (2013). Soziale Herkunft als Bedingung der Kompetenzentwicklung [Social background as condition for the development of competencies]. In M. Prenzel, C. Sälzer, E. Klieme, & O. Köller (Eds.), PISA 2012. *Fortschritte und Herausforderungen in Deutschland* [PISA 2012. Progress and challenges in Germany] (pp. 245–275). Münster: Waxmann.

Petko, D. (2012). Teachers' pedagogical beliefs and their use of digital media in classrooms: Sharpening the focus of the 'will, skill, tool' model and integrating teachers' constructivist orientations. *Computers & Education*, *58*(4), 1351–1359. https://doi.org/10.1016/j.compedu.2011.12.013

Shin, W., & Lwin, M. O. (2017). How does "talking about the Internet with others" affect teenagers' experience of online risks? The role of active mediation by parents, peers, and school teachers. *New Media & Society*, *19*(7), 1109–1126. https://doi.org/10.1177/1461444815626612

Siddiq, F., Scherer, R., & Tondeur, J. (2016). Teachers' emphasis on developing students' digital information and communication skills (TEDDICS): A new construct in 21st century education. *Computers & Education*, *92/93*, 1–14. https://doi.org/10.1016/j.compedu.2015.10.006

Statistisches Informationssystem Bildung. (2019). *Statistik im Schulbereich: Thüringen im Schuljahr 2017/18*. [Statistics of the school sector: Thuringia in the school year 2017/18] Retrieved from http://www.schulstatistik-thueringen.de/pdf/Statistikplakat_A3g.pdf

Tejedor, S., & Pulido, C. (2012). Retos y riesgos del uso de Internet por parte de los menores. ¿Cómo empoderarlos? [Challenges and risks of kids' internet use. How to empower them?] *Comunicar*, *20*(39), 65–72. https://doi.org/10.3916/C39-2012-02-06

Tiede, J., & Grafe, S. (2016). Media pedagogy in German and U.S. teacher education. *Comunicar*, *24*(49), 19–28. http://dx.doi.org/10.3916/C49-2016-02

UNESCO. (2008). *ICT competency standards for teachers*. Paris: UNESCO.

Wernstedt, R., & John-Ohnesorg, M. (2008). *Soziale Herkunft entscheidet über Bildungserfolg. Konsequenzen aus IGLU 2006 und PISA III*. [Social background decides about success in education. Consequences from the IGLU 2006 and the PISA III] Berlin:

Friedrich-Ebert-Stiftung. Retrieved from http://library.fes.de/pdf-files/stabsabteilung/05314.pdf

Wilson, C., Grizzle, A., Tuazon, R., Akyempong, F., & Cheung, C. K. (2011). *Media and information literacy curriculum for teachers*. Paris: UNESCO. Retrieved from http://unesdoc.unesco.org/images/0019/001929/192971e.pdf

Wolling, J., & Berger, P. (2018). *Die Vermittlung von Medienkompetenz in allgemeinbildenden Schulen: Zentrale Ergebnisse eines Evaluationsprojekts* [Fostering media literacy in general education schools: Central results of an evaluation project]. Ilmenau: Ilmenau Universitätsverlag.

About the Authors

Priscila Berger is a Research Assistant and PhD Candidate in the Department of Empirical Media Research and Political Communications at the TU Ilmenau (Germany). Her academic background consists of a bachelor's degree in Communication Studies (UFSM, Brazil), a vocational teaching degree (UFSM, Brazil) and a master's degree in Media and Communication Science (TU Ilmenau). Her main research interests are digital media in educators' practices and media literacy education.

Jens Wolling is a Professor of communication research and political communication at the TU Ilmenau (Germany). He has studied communication science and history at the Freie Universität Berlin and has worked as a researcher at the TU Dresden and as a Professor at the Ludwig-Maximilians-Universität (Munich). He has conducted research on a large variety of issues related to political communication and media.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 148–159
DOI: 10.17645/mac.v7i2.1922

Article

Self-Efficacy in Multimodal Narrative Educational Activities: Explorative Study in a Multicultural and Multilingual Italian Primary School

Monica Banzato * and Francesca Coin

Department of Linguistics and Comparative Cultural Studies, Ca' Foscari University of Venice, 30123 Venice, Italy; E-Mails: banzato@unive.it (M.B.), francesca.coin85@unive.it (F.C.)

* Corresponding author

Submitted: 15 December 2018 | Accepted: 28 February 2019 | Published: 11 June 2019

Abstract
The international migration changed the situation in the Italian school system: it is asked to update educational practices with new pedagogical models of narration and expression (multiliteracies and multimodality) and to promote digital skills from childhood. Self-efficacy, more than the actual performance, influences the will to try again and not give up. Few studies are available on how narrative self-efficacy affects expressive development, especially in school contexts characterized by multilingualism and multiculturalism. This exploratory survey aims to investigate the narrative self-efficacy of eighteen 8-year-old children attending primary school, with a significant presence of international migrant children (two out of three). For three months, these students were involved in multimodal narrative learning activities through gestural/mime languages (theatre), visual languages (drawings), verbal languages (oral and written) and digital languages (digital video narration). The research questions were: (1) Does the multimodal workshop influence the self-efficacy beliefs of the narrative skills perceived by Italian students (L1) and international migrant students (L2)? (2) Does the most influence come from the mime/gestural, the digital video or the entire multimodal narrative activities? (3) In which aspects of the narrative is the self-efficacy most influenced by the multimodal workshop for L1 and L2 groups?

Keywords
international migrant students; multicultural; multilingualism; multiliteracies; multimodality; narrative skills; primary school; self-efficacy

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

For some years, students with migratory origins have represented the dynamic component of the Italian school system. They contribute by their numerical growth to containing the decline in the overall school population, which results from the continuing decline of Italian students. In the five years from 2011/2012 to 2015/2016, Italian students decreased by 193,000, from 8,205,000 to 8,012,000 (−2.3%), while foreign students increased by 59,000 (+7.8%), going from 756,000 to 815,000 (Ministero dell'Istruzione dell'Università e della Ricerca [MIUR], 2017).

The data on literacy (Santagati & Ongini, 2016) reveals that foreign students get systematically lower results than their Italian peers, even if the gaps between Italian and second-generation foreign students are smaller than those recorded for first generation students. The difference is more pronounced for the expressive disciplines such as Italian (about 10 percentage points) than the logical-mathematical disciplines (about 6 points). This gap tends to increase by another 4 points in Italian and 1 point in mathematics in secondary schools (OECD–PISA, 2012).

Many public and private projects are being implemented for the acquisition of the Italian language by

newly arrived students, but they are sufficient to teach them only basic skills. Expressive literacy, therefore, is considered one of the emergency areas in which investment from primary school on is required, both for the purposes of social, cultural and digital inclusion of foreign students and to contain the growing dropout rate that afflicts secondary schools. The higher schools, indeed, show a school dropout rate—especially for foreign students (34.4% against 14.8% of Italian students)—higher than comparable European schools (22.7% and 11% respectively; OECD–PISA, 2012).

At the same time, teachers are challenged (1) by international educational and pedagogical research and (2) by European Union (Redecker, 2017) and national education policies (MIUR, 2016) to update their teaching methods. They are required to move from monoliteracy to multiliteracy educational practices, starting with primary school classes. The pedagogical approach of multiliteracies, a term coined by the New London Group (NLG, 1996), begins with a critique of traditional education based on a single literacy (i.e., centred on a single language, a single national form of language and culture). This approach requires rethinking education goals and teaching methods, with the aim of incorporating a wide range of literacies (plural) in order to bring together forms of creation and meaning based on a plurality of languages and modalities. This requirement is based on two premises: (1) the growing importance of cultural and linguistic diversity due to the effects of international migration at the global level and (2) the increasing variety of languages and ways of thinking, creating and communicating meaning available in digital environments. As Wilber (2010) states new literacies are multimodal (Jewitt, 2009; Kress, 2000; Walsh, 2010), or composed of multiple modalities—"configurations of images, gesture, gaze, body posture, sound, writing, music, speech, and so on" (Jewitt, 2008, p. 243). The digital text is different from the printed page. This means that thinking, reading and writing have also changed because readers (in receiving) and writers (in producing) must make sense of the multiple modes of communication (video, images, etc.). It is proposed that the use of multimodal languages could help to reduce the communication disadvantages that hold back foreign students. This proposition challenges the common, and still widespread, understanding of school literacy: the focus shifts from written text to multimodal structures which are created, understood, shaped and reshaped (in the case of remixing).

Multimodal learning had already been studied in the pre-digital era (Stoll-Lillard, 2005), as for example in the works developed by Montessori according to which "motor behaviour and cognition are closely intertwined and physical movement can improve thought and learning" (Massaro, 2012, p. 2378). Today, when multimodal digital environments envelop/surround the development of children from birth, they are embedded in an "embodied learning, involving multiple sensory systems and systems of action of the learner" (Massaro, 2012, p. 2378). The true challenge for teachers is to develop expressive literacies, while keeping the children's self-efficacy high for as long as needed to learn multicultural and multimodal languages. In this complex context, there is an important gap in the research on the self-efficacy of skills developed through multimodal narrative academic activities promoted at primary school. In fact, (1) narrative plays a central role in literacy in primary school for the development of the child's verbal skills (oral and written). However, the potential of multimodal narrative practices still seems to be little explored and diffused in Italian schools, which generally favour activities centred on written verbal modes, and where international students leave with inevitable disadvantages (see data above); (2) little is known about how multimodal teaching practices influence self-efficacy (see Section 2) in multicultural and multilingual classes. Self-efficacy is considered a crucial factor for school adaptation and success. The term refers to "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances" (Bandura, 1986, p. 391). Self-efficacy beliefs are found to be related to students' academic motivation, self-conception, goal orientation, performance levels and anxiety, as well as success and risk of drop out (Caprara et al., 2008; Usher & Pajares, 2008; Zimmerman, 2002). More than the performance itself, the perception of one's self-efficacy determines the tenacity with which individuals make greater or lesser effort to improve their learning.

Narration is a fertile ground on which to train the aforementioned skills. For this reason, the exploratory survey presented in this article aims to investigate the self-efficacy of narrative skills of students in a third-grade class of 18 children (age 8) of a primary school with a strong presence (60%) of international migrants (group L2) and 40% Italian students (group L1) involved in activities of multimodal narrative learning through mime/gestural languages (realized through shadow theatre), visual languages (drawings that narrate theatrical scenes realized by the children) and verbal languages (spoken/written to narrate the drawn scenes), assembled at the end into a digital video narration (see Figure 1 in the Appendix).

2. Related Work: Self-Efficacy, Multimodality, and Multicultural and Multilingual School Contexts in Primary School

Very little research has tried to understand the relationships between these four themes: (1) self-efficacy, (2) activities of multimodal narrative learning, and (3) multicultural and multilingual school contexts in the (4) primary school.

In the literature, much of the research focuses mainly on academic self-efficacy (reading, writing and mathematics; Bandura, 1997); such research is usually limited to English-speaking North American monolinguals (Gwénaëlle & Usher, 2011). Research in Europe, and par-

ticularly in Italy, is mostly limited to monolingual schools (Caprara et al., 2008) and is even more limited in multilingual schools. Most of the research regarding self-efficacy in academic literacy is directed at middle schools onwards, while the number of inquiries investigating the sources of self-efficacy, particularly among primary school students, decreases significantly; although this is the period in which children are particularly receptive and begin to develop the first phases of this important construct (Usher & Pajares, 2008). Moreover, the research of the last forty years has mainly investigated school self-efficacy developed through educational transmission (i.e., teacher centred; OECD, 2009) approaches (for reasons of historical contingency; Caprara et al., 2008; OECD, 2009). The research gap increases if we take into account the variable multilingual and multicultural school contexts. There are research studies but they are concentrated mainly in North America, and they investigate high school age students and English speaking cohorts. From this research, we learn that there is a correlation between low self-efficacy beliefs and the high risk of early school leaving among foreign students (e.g. Afro-American, Hispanic and Caucasian; Pajares, 2003). The performance of foreign students decreases as they continue their studies. Moreover, once negative perceptions are rooted in student beliefs, they become resistant to change even in the face of obvious improvements (Bandura, 1986; Nisbett & Ross, 1980). However, Klassen and Georgiou (2008; Klassen, 2002; Klassen, 2004) observe that perceptions of self-efficacy are still investigated in too isolated a way in homogeneous and heterogeneous racial studies.

Restricting our research on self-efficacy to multimodal narrative practices in multicultural and multilingual primary schools by means of databases such as ERIC, PsycINFO, SCIENCEDIRECT, SAGE and SCOPUS has not yielded satisfactory results.

There is research on multimodal narrative activities, but it is mainly developed with qualitative methods (in particular the semiotic approach) for adolescent students (Binder & Kotsopoulos, 2011; Jewitt, 2008), sometimes in the presence of foreigners (Honeyford, 2014; Ntelioglou, Fannin, Montanera, & Cummins, 2014), but it does not specifically take into account psychometric constructs such as self-efficacy. There is research that takes into account self-efficacy in the context of the educational method of digital storytelling, but this focuses in particular on the digital skills of the students (Ballast, Stephens, & Radcliffe, 2008; Banaszewski, 2005; Heo, 2009; Yoon, 2013) or on the effectiveness of a particular digital environment used to build digital storytelling (Dogan, 2015; Ibanez, Aylett, & Ruiz-Rodarte, 2003; Scaffidi & Chambers, 2012; Shin, & Park, 2008). We did not consider this research because our exploratory study is not focused on the use of "digital" + "storytelling", but on the multimodal narrative learning processes in reception and production that start from narrative activities/gestural expressions (analogical modality) to visual and verbal activities (both analogical and digital modalities) and to digital videos (digital modality).

We have verified the existence of a research gap on self-efficacy beliefs developed through multimodal narrative activities, promoted since childhood in class contexts characterized by multilingualism and multiculturalism. Given the nature of the experimental activities proposed in our work and the diversity of the contexts of origin, we decided not to compare the results of our students with those obtained from the literature mentioned above.

3. Aim of the Study

The exploratory survey presented in this article aims to investigate self-efficacy regarding the narrative skills of 18 eight-year-old children. They attend the third grade class in a primary school with a strong presence (60%) of international migrant students (11 pupils) and 40% Italian students (7 pupils). We investigated the children's self-efficacy regarding narration, as that is a central activity in the development of a literacy curriculum in primary schools. This type of study provides an opportunity to document the delicate transition phases from the traditional school comprised of pupils with a similar background to the current ones (with a strong presence of international migrants, bearers of different literacies and languages). It also encourages reflection on the strengths and weaknesses of these learning modalities in relation to the self-confidence perceived by children who speak Italian as their mother tongue (L1) and as their second language (L2). The goal is to provide results that serve as a starting point for further investigation of multimodality teaching. Multimodal narrative activities are presented here as a relevant educational/pedagogical inquiry on the passage from monoliteracy to multiliteracies. The children were involved in multimodal narrative learning activities through mime/gestural languages (in this case, shadow theater), visual languages (drawings for theatrical scenes) and verbal languages (spoken/written sentences to narrate the plot). These varied activities were assembled at the end into a digital video narration. The experimentation, which was developed over three months through a total of 40 hours of training, was initially based on an adaptation for children of Shakespeare's play The Merchant of Venice (Tosi, 2015). The phases of the workshop alternated between passive and active narrative forms: (1) listening to an oral version of The Merchant of Venice; (2) reading aloud the story accompanied by illustrations; (3) interpreting the scenes through mime and gestural language realized in a shadow theater; (4) identification of the scenes by the children viewing them as spectators; (5) narration by the children of the main scenes of The Merchant of Venice through drawings and short descriptions, first oral and then written; (6) digitization of drawings and short written narratives; (7) assembly of the materials produced by

the children to create a short narrative video; (8) finally, sharing of the end products with the children's parents.

Four research questions guided the study (see Figure 1 in the Appendix):

RQ1: Does the multimodal laboratory influence the self-efficacy beliefs about their narrative skills perceived by Italian students (L1) and international migrant students (L2)?
RQ2: Does the mime/gestural narrative influence the self-efficacy beliefs about their narrative skills perceived by Italian students (L1) and international migrant students (L2)?
RQ3: Does the digital video narrative influence the self-efficacy beliefs about their narrative skills perceived by Italian students (L1) and international migrant students (L2)?
RQ4: In which aspects of the narrative is self-efficacy most influenced by the multimodal workshop for Italian (L1) and international migrant (L2) students?

3.1. Participants

Eighteen eight-year-old students participated in the educational project. The class group consisted of 7 Italian students, 6 females and 1 male (L1 group) and 11 international migrant students, 8 females and 3 males (L2 group). The L2 group comes from seven different countries: Albania, Bangladesh, China, Egypt, Macedonia, Moldova, Philippines. Among the eleven foreign pupils in our class, six were born in Italy. The other five arrived in Italy before the age of three, so the majority of them attended three years of preschool. They speak Italian at school and the family language at home. All foreign pupils can speak Italian at a level sufficient for daily communication. Three of them show poor lexicon and syntax. Seven of them can read with the same fluency as their Italian classmates, whereas four read slower and make more mistakes. Only four children have a written production comparable with Italian peers. Seven use shorter sentences, poorer lexicon and make a greater number of orthographical mistakes. From the point of view of socialization, the class group appears cohesive and there are no signs of exclusion due to cultural differences. However, foreign children are less involved in play-activities outside the school, due to the difficulties of communication between parents. All of the children use tablets or PCs to watch cartoons, movies and play games. Consequently, their computer activities are passive rather than productive.

3.2. Procedure

Before the project started, approval and authorizations from the school and parents were obtained. Three questionnaires were designed: a narrative pre-test, focusing on general narrative self-efficacy beliefs and two post-tests aimed at detecting self-assessments about gestural and mime narrative skills (post-test 1 theater), and narrative abilities based on digital video narration (post-test 2 video). The narrative pre-test was administered before the activities began, the post-test 1 theater after the shadow theater activities and the post-test 2 video after the digital video narration. A trial version of the questionnaire was verified through a group of volunteers, three Italian and three foreign third-grade students. They were asked to think aloud while answering the items. In addition, they were asked to write down words or phrases they did not fully understand. Based on their feedback, some items were modified to make the questionnaire more easily readable. The administration of the tests took place collectively. The researcher read aloud the questions to make sure everyone understood the text. A collective and indirect way of collecting information was preferred, thinking that this would put the children equally at ease (both the L1 group and the L2 group), giving them time to understand the question and think about the answer. The teachers were present at the administration and gave positive feedback on the accuracy with which the children responded. Subsequently, the statistical elaboration confirmed that the children's responses were significant and not due to chance (see Sections 3.3. and 4).

3.3. Instrument

The questionnaire items were written as first-person statements. Students were asked to evaluate their agreement level on a Likert scale from 1 (not true) to 4 (completely true). Although most of the items were positively formulated, some were formulated negatively (Bandura, 1997). The perceived effectiveness is measurable only through self-assessment, as only the subject can provide valuations of their convictions. The items investigate only the perception of being able to do, and not wanting to do (intention) or being used to do (habit). Many tools have been developed in the literature to measure perceived self-efficacy for different groups of the population, ranging from scholastic to working contexts. However, we did not find a validated questionnaire about multimodal activity and narrative literacy skills (see Sections 1 and 2). Inspired by Chen, Gully and Eden (2001) General Self-Efficacy Scale (GSES), we decided to design an ad hoc questionnaire for the purpose of investigating some of the crosscutting categories of our multimodal narrative activities.

Four categories were identified: *Thinking Actions*, *Realizing Actions*, *Thinking Emotions* and *Realizing Emotions*. Later, we added *Feedback* from others and *Self-Assessment*. Each item was designed to promote thinking about the skills required in classic narration; next, a corresponding form was created for the theatrical and the video narration activities. Below is a brief description of the categories, with sample items:

1. *Thinking Actions* is related to the children's beliefs about their capacity to imagine characters' actions

in a narrative. An example of a classic narration item: am I able to imagine the actions of the characters in a story? An example of an item of theatrical narration: Was I able to imagine the actions of the character I played in my scene? An example of an item of the video narration: Was I able to think of the sentences to describe the actions that took place in the video scene?

2. *Realizing Actions* is related to the children's convictions of their ability to describe the actions of a narration. An example of an item concerning classic narration: am I able to recount the actions of the characters? For verification, we asked about their beliefs regarding their ability to describe actions in their daily lives. An example of an item: am I able to recount my adventures? An example of an item from the theatrical narration: was I able to mime the action of my character? An example of an item from the video narration: was I able to imagine an effective action sequence to tell the story of my video? Since children were not Italian native speakers, we wanted to investigate in more depth the cause of any difficulties they encountered. To accomplish that, we isolated a sub-category of more specific questions concerning their ability to find the right words to describe actions (Right word and gesture). An example of an item regarding classic narration: am I able to find the right words to narrate the actions of the characters?
3. *Thinking Emotions* is related to the children's beliefs about their ability to imagine and understand the emotions of the characters in a story. An example of an item from classic narration: am I able to understand how the characters in a story feel? An example of a theatrical narrative item: was I able to understand how the character in my scene was feeling?
4. *Realizing Emotions* is based on the children's beliefs about their ability to describe the characters' emotions in a story. An example from a classic narrative: am I able to describe a character's emotions? An example from a theatrical narration: was I able to mime the emotions of my character? And from the deeper version: was I able to find the right gestures to mime the emotions of my character?
5. *Feedback* from others is related to the children's beliefs about their ability to tell a story and be understood by others. An example of an item from classic narration: when I tell a story to others, do they understand me? An example of an item from the theatrical narration: did my classmates immediately guess the scene I was representing?
6. *Self-Assessment* is related to the children's beliefs about their ability to tell a story in Italian and in their language of origin. An example item: am I able to narrate a story in Italian?

The array of the questionnaire consists of 23 items in total (9 in the pre-test, and 7 for the post-test 1 theater and 7 for the post-test 2 video). When putting it into written form, we paid particular attention to: a) the formulation, taking into account that the majority of children are international migrants who speak Italian as L2; b) the content, which had to be consistent with the activities of the educational workshops and the objectives of the exploratory study; c) the time needed to administer the questionnaire, especially the post-tests, which took place after long sessions of educational activities.

Before proceeding with the analysis of the results, the reliability of the questionnaire was estimated through Cronbach's Alfa score. From the calculation of this index, we obtained a good result (α 0.846), also confirmed by the statistics on the items. The result is again confirmed by the fact that, trying to remove one item at a time from the questionnaire, the value of α remains lower than 0.846. The total correlation of the items is always higher than 0.4 for each item, demonstrating a good internal consistency of the questions.

Since the number of questions and participants is very small, it is preferable to illustrate the data not as single categories (from 1 to 4), but rather by grouping them into meta categories. The reliability of the grouped questions was then evaluated according to the groupings: *Thinking Narration* (cat. 1+3), good, α 0.809; *Realizing Narration* (cat. 2+4), discrete, α 0.703; *Expressing Actions* (cat. 1+2), discrete, α 0.732; *Expressing Emotions* (cat. 3+4), sufficient, α 0.636. The items *Feedback* from others (cat. 5) and *Self-Assessment* (cat. 6) did not obtain sufficient alpha ($\alpha = 0.581$). Therefore we decided not to include them in subsequent analyzes.

4. Results Analysis

Before calculation of the Student t-test, a normality test was carried out on the data, to verify that they were distributed in a Gaussian manner. In particular, because our sample was composed of fewer than 50 subjects, we chose the Shapiro-Wilk test, obtaining a value of sig. equal to 0.293 for pre-test narration compared to the post-test 1 theater; 0.388 between pre-test narration and post-test 2 video; 0.060 between post-test 1 theater and post-test 2 video, confirming the normal distribution of data.

A t-test for paired samples was conducted to assess if there was a statistically significant difference between the mean scores in beliefs about their narrative skills perceived by the students before and after each of the main steps. The results of the t-test are especially significant in the final steps, i.e. in the transition between the post-test 1 theater and the post-test 2 video ($t(17) = -3.50$, $p < .005$) and between pre-test narration and post-test 2 video ($t(17) = -2.79$, $p < .01$).

Grouping *Thinking Narration* 1+3: Grouping self-efficacy data to investigate children's ability in *Thinking Narration* records a statistically significant change from

post-test 1 theater to post-test 2 video (t (17) = −2.41, p <.02). While, the change in pre-test narrative and post-test 2 video is not statistically significant, it shows a slight increase (see table 1.).

Grouping *Realizing Narration* 2+4: Grouping data for *Realizing Narration*, we can see how the change in self-efficacy is statistically significant between the pre-test narration and post-test 2 video (t (17) = −2.89, p <.01) and between the post-test 1 theater and the post-test 2 video (t (17) = −3.57, p <.002) (see table 1.).

Grouping *Expressing Actions* 1+2: Grouping data by *Expressing Actions*, it is possible to see that the change in self-efficacy is statistically significant between the pre-test narration and post-test 2 (t (17) = −42.46, p <.02) and between the post-test 1 theater and the post-test 2 video (t (17) = −3.55, p <.002) (see table 1.).

Grouping *Expressing Emotions* 3+4: Grouping data for *Express Emotions*, we can see the change in self-efficacy is statistically significant between the pre-test and post-test 2 video (t (17) = −3.36, p <.004) and between the post-test 1 theater and the post-test 2 video (t (17) = −2.95, p <.009) (see table 1.).

Grouping *Right Words and Gestures*: It is important to remember that for the theater questions the children's self-efficacy beliefs were measured on gestural narrative communication skills, while the pre-test narrative and post-test 2 videos measured the ability to express themselves with the right words and sentences. The difference between the post-test 1 theater and post-test 2 video (t (17) = −2.69, p <.01) is statistically significant (see table 1.).

Further subdividing the data by groups of students, L1 (see table 2.) and L2 (see table 3.), we can see an increase in the average scores for both groups in all the categories of questions. Because of the small number of participants and the further subdivision into subgroups, the statistical significance is only present in a few comparisons; however, the tendency to improvement is evident.

Table 1. Pre-test, post-test 1 theater and post-test 2 video: means, standard deviations and results of t-test for self-efficacy divided by categories for all children.

L1*+L2**	Mean Pre Narration	DS	Mean Post1 Theater	DS	Mean Post2 Video	DS	T (pre-post1)	p	T (pre-post2)	p	T (post1-post2)	p
Thinking Narration 1+3	3.11	.97	3.11	.67	3.58	.46	.000	—	−1.934	—	−2.411	<.02
Realizing Narration 2+4	3.09	.66	3.16	.66	3.61	.40	−.619	—	−2.892	<.01	−3.575	<.002
Expressing Actions 1+2	3.18	.76	3.11	.75	3.63	.44	.684	—	−2.463	<.02	−3.557	<.002
Expressing Emotions 3+4	2.97	.97	3.19	.62	3.63	.41	−1.254	—	−3.367	<.004	−2.950	<.009
Right Words and Gestures	3.09	.79	3.00	.76	3.52	.52	.801	—	−2.006	—	−2.695	<.01

Notes: *L1 = Italian students; **L2 = international migrant students.

Table 2. Pre-Test, post-test 1 theater and post-test 2 video: means, standard deviations and results of t-test for self-efficacy according to categories for Italian students (L1).

L1	Mean Pre Narration	DS	Mean Post1 Theater	DS	Mean Post2 Video	DS	T (pre-post1)	p	T (pre-post2)	p	T (post1-post2)	p
Thinking Narration 1+3	3.07	1.05	3.28	.48	3.57	.44	−.660	—	−1.449	—	−1.922	—
Realizing Narration 2+4	3.14	.71	3.23	.63	3.53	.33	−.372	—	−1.390	—	−1.427	—
Expressing Actions 1+2	3.28	.65	3.35	.47	3.50	.40	−.465	—	−.776	—	−1.000	—
Expressing Emotions 3+4	2.85	1.06	3.14	.62	3.64	.37	−.834	—	−2.420	<.05	−2.646	<.03
Right Words and Gestures	3.15	.71	3.14	.26	3.50	.50	.053	—	−1.039	—	−1.109	—

Table 3. Pre-test, post-test 1 theater and post-test 2 video: means, standard deviations and results of t-test for self-efficacy according to categories for international migrant students (L2).

L2	Mean Pre Narration	DS	Mean Post1 Theater	DS	Mean Post2 Video	DS	T (pre-post1)	p	T (pre-post2)	p	T (post1-post2)	p
Thinking Narration 1+3	3.13	.97	3.00	.77	3.59	.49	−.606	—	−1.311	—	−1.921	—
Realizing Narration 2+4	3.06	.87	3.12	.72	3.65	.45	−.491	—	−2.500	<.03	−3.464	<.006
Expressing Actions 1+2	3.12	.86	2.95	.87	3.72	.46	1.141	—	−2.489	<.03	−3.963	<.003
Expressing Emotions 3+4	3.04	.96	3.22	.64	3.63	.45	−.886	—	−2.277	<.04	−1.845	—
Right Words and Gestures	3.05	.87	2.90	.83	3.54	.56	1.437	—	−1.661	—	−2.514	<.03

Regarding perceived confidence, the L2 group shows a greater initial security in the *Thinking Narration* category, while the L1 group seems to be more secure in *Realizing Narration*. This gap is also found in the sub-category *Finding the Right Words and Gestures*, in which Italian pupils perceive themselves as more competent.

Regarding the confidence about the most specific skills of communicating a narrative scene, L1 children feel more comfortable in *Expressing Actions* while the L2 group thinks they manage *Expressing Emotions* better. As has been demonstrated above, the improvements, although gradual and constant, do not make themselves evident in the early stages of the project. And initial comparisons between pre-test narration and post-test 1 theater are not as significant as those seen towards the end of the workshop, between post-test 1 theater and post-test-2 video and between pre-test narration and post-test 2 video.

In particular, the L2 pupils' scores increase in *Realizing Narration* between pre-test narration and post-test 2 video ($t(10) = -2.50$, $p < .03$) and between post-test 1 theater and post-test 2 video ($t(10) = -3.46$, $p < .006$). In *Expressing Actions* they improve between pre-test narration and post-test 2 video ($t(10) = -2.48$, $p < .03$) and between post-test 1 theater and post-test 2 video ($t(10) = -3.96$, $p < .003$). In *Expressing Emotions* they improve between pre-test narration and post-test 2 video ($t(10) = -2.27$, $p < .04$). In *Finding Right Words and Gestures* they improve between post-test 1 theater and post-test 2 video ($t(10) = -2.51$, $p < .03$). The L1 group shows significant increases in *Expressing Emotions* between pre-test narration and post-test 2 video ($t(10) = -2.42$, $p < .05$) and test 1 theatre and post-test 2 video ($t(6) = -2.64$, $p < .03$).

5. Discussion

We can conclude from the results of this exploratory study that the multimodal-based workshop led, in general, to a significant increase in perceived self-efficacy for the whole class. Therefore, the first question (RQ1) has a positive answer. The children appreciated the activities, in particular the L2 group, which started disadvantaged in several categories in the pre-test narration. In *Realizing Narration* there was a difference of 0.08 points, and also for the category *Right Words and Gestures* there was a difference of 0.10 points, always to the disadvantage of the L2 group. This disadvantage did not only concern expression through words, but also through gestures, since the gap endured in the post-test phase 1 theater, in which the L2 group perceived less confidence and greater effort than the L1 group, with almost 0.24 points difference. We are inclined to hypothesize that L2 students extended their insecurity in expressing themselves through words to their general expressive capacity, manifesting it in non-verbal activities, such as the gestural theater, in which the prevailing modality of expression is non-verbal.

Going into the details of the different steps, we note that the theatrical workshop produced the least significant improvements, compared to the subsequent digital video narration. However, the negative answer to the second research question (RQ2) can find different possible explanations. Primarily, we must consider the initial discrepancy in the self-efficacy level, previously mentioned. The L2 group may have simply needed more time than the L1 group to gain self-confidence, due to their perceived effort and insecurity being greater from the start. We interpret the slow improvement of the L2 group, such as it was, to the succession of different activities, which gradually reinforced their confidence.

We can respond positively to the third question (RQ3), on the role of video narration, as it significantly influenced the self-efficacy beliefs of narrative skills perceived by both L1 and L2 students. We believe that video workshops played a crucial role especially on three levels: (1) on a cognitive level, the video editing involved children in reworking the visual and writing narrative ele-

ments. Indeed, we have observed that the children have committed themselves to writing and rewriting the texts on the computer several times, to change the images and texts on screen and to try various graphic solutions to make the product more effective, or as they said: "To make the narration more beautiful". They corrected each other when they wrote, for example: "*Arrabbiato* (Italian for angry) is spelled with two r's, not one". Moreover, it also had an effect (2) at the self-efficacy level: video editing allowed the children to review themselves in the photos and in the drawings and led them to appreciate their expressive performance; they said this made up for the low perception of self-efficacy that they had felt during the theatrical workshop. Indeed, during the video lab, the children, observing their photos and their drawings, commented to their classmates: "Uh, you see here how good *Portia* was at showing surprise for the riddle solution". Or about themselves: "Here, I should have stretched my arm out more to show the Bassanio ring"; "There, I was really dramatic. See how I keep my hands open and up!". Or simply: "I like this picture because I was acting really well". Finally, (3) the video allowed them to summarize their different activities in a single finished and tangible product, unlike the variable oral and theatrical narratives.

For these reasons, from an educational point of view, we believe that the digital video activity had the effect of building confidence and motivation in engaging in narration; above all, it reduced self-perceptions of insecurity. The combination of all these factors was helpful in determining the success of the workshop (in response to the RQ1 question).

More information is obtained by analyzing the answers to the fourth question (RQ4), which measured relative improvements in the various categories for each group. In particular, both groups displayed a remarkable recovery in the critical areas that were of major concern. The L2 group improved decisively in the categories *Realizing Narrative*, *Expressing Actions* and *Right Words and Gestures* to reach L1 group self-efficacy levels. Likewise, the L1 group, which had been less confident in *Expressing Emotions*, showed a notable improvement. In other aspects, too, an enhancement of confidence is almost consistently reported; these results, however, are probably not statistically significant since they start from higher scores compared to the critical areas.

6. Research Limits

Our study moved within the socio-cognitive theoretical framework of Bandura and specifically investigated the construct of self-efficacy of multimodal narrative activities in classes with a strong presence of foreign-origin students. This exploratory study aimed to discriminate some processes of multimodal narration in reception and production (see Section 3). In the future, we intend to broaden our field of investigation in order to generalize the educational potentialities and implications of multimodal narration, also on the level of social, cultural and digital inclusion. However, we think that this work can usefully inform those working in this field, both at the research level (researchers) and in the practical field (teachers).

A second limitation is related to the number of participants. Since only one class was involved, in which the number of Italian and foreign students, male and female, was not well balanced, the data cannot be considered in any way generalizable to a larger population. Replicating the study in other classes and in other contexts could enrich and help validate the available information.

The third limitation is intrinsic to the research design: a single group subjected to a pre-test and two post-tests. A control group would allow more accurate and sensible comparisons, although it should be emphasized that this type of educational activity requires a substantial effort in terms of time, resources and commitment by researchers and teachers involved.

The fourth limitation concerns the tools: although the questionnaire was internally validated, it was not possible to validate it externally as that would require a larger number of participants. We will elaborate further items, in particular the sources of Bandura's self-efficacy (Bandura, 1997). We intend to re-elaborate those items in the *Feedback* category that did not give statistically significant results. It will be necessary to verify if the problem resulted from an improper formulation or in difficulties of self-evaluation for 8-year-old children, whose metacognitive structures are still being developed.

Finally, it would have been interesting to compare these results with other research but unfortunately, for the reasons explained in Sections 1, 2 and 3, that was not possible.

7. Educational Implications and Conclusions

As our exploratory work shows, improvements in self-efficacy beliefs are not immediate. This implies that these processes have to be known and supported by teachers. In fact, we have recorded in the pre-text that the two groups (L1 and L2) were already starting with differences in perceptions of self-efficacy and when faced with new tasks (for example, the mime/gestural activity of the theatre) the difference tended to increase. The children had already learned processes of transferring self-efficacy from one activity to another and of generalizing self-efficacy based on their abilities (Bandura, 1997). Increasing the perception of self-efficacy takes a long time to achieve significant and lasting results. The development of rules and strategies for resilience is a sophisticated construct that begins to develop from primary age children, but requires opportunities and educational guidance for full achievement. Children of this age still appear uncertain about making accurate self-assessments (as we also found in our study), and they rely on the judgments of others to create their own beliefs of trust and self-esteem. The idea of the self in children of this age is

like "mirror glass" (Pajares, 2002),as it is formed as a result of the perception of how others see or judge them, or from the feedback that children receive from adults.

Two implications arise naturally from these observations. The first is that teachers have a great responsibility to nurture the trust of their students, because personal beliefs can have positive or negative influences; the second is that they have a responsibility to develop educational activities that nurture and guide the students' sense of self-efficacy.

The current educational practices of teachers are predominantly verbal oriented and foreign students who leave with disadvantages in verbal expressive skills are at risk of repeated failures or slow improvements that provide little gratification. Multimodality, on the other hand, offers children the possibility of demonstrating their abilities with alternative modes of expression, of equal dignity to the verbal, and to find confirmation in their own abilities to face new challenges.

Multimodal narrative educational activities allow a broadening of the educational and pedagogical ambit: for example, even the repetition of the same topic in different ways has allowed children to master narrative patterns with different languages (gestural, visual, verbal and digital processing), which become part of their personal cultural heritage. Multimodality has allowed children to manipulate concepts, rules and narrative schemes, gradually transforming them from gestural thoughts/actions to verbal/visual and digital equivalents. This occurs both in reception and production (see Section 3), and avoids the monotony or excessive effort of the repetition of a single modality—the verbal one (see Sections 4 and 5).

In our experimental activities (theatrical, visual and digital), the children were exposed to continual verbalization, through which the teachers were enabled to encourage them, correct them and help them to improve their verbal skills. This extended to giving the children immediate feedback on their proposed activities.

For future research, we believe it is crucial to extend the survey to the self-efficacy of teachers who engage in multimodal educational practices in classes with a strong presence of foreigners, since the self-efficacy of teachers is a strong predictor of academic results of primary school children. It is important to study further how the self-efficacy of teachers influences that of their students, and further how the self-efficacy of the students influences one another. The aim is to obtain a more complete and better informed picture of the impact of multimodal practices in classes that contain a large presence of children of migrant origins.

Acknowledgments

This work is supported by EU project SHABEGH (CREATIVE EUROPE—CULTURE) (Project Reference: 570754-CREA-1-2016-1-IT-CULT-COOP1). Note: for reasons of national assessment of Italian university research, the authors must declare which sections each has written, in spite of the fact that work is entirely the result of continuous and intensive collaboration. Sections 2, 4, 5, and 7 are by Monica Banzato. Sections 1, 3, and 6 are by Francesca Coin. Our thanks to Matthew Hoffman.

Conflict of Interests

The authors declare no conflict of interests.

References

Ballast, K., Stephens, L., & Radcliffe, R. (2008). The effects of digital storytelling on sixth grade students' writing and their attitudes about writing. In K. McFerrin (Ed.), *Proceedings of society for information technology and teacher education international conference 2008* (pp. 875–879). Chesapeake, VA: AACE.

Banaszewski, T. (2005). *Digital storytelling, supporting digital literacy in grades 4–12* (Unpublished doctoral dissertation). Georgia Institute of Technology, Atlanta, GA. Retrieved from http://hdl.handle.net/1853/6966

Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1997). *Self efficacy: The exercise of control*. New York, NY: W.H. Freeman and Co.

Binder, M., & Kotsopoulos, S. (2011). Multimodal literacy narratives: Weaving the threads of young children's identity through the arts. *Journal of Research in Childhood Education*, *25*(4), 339–363.

Caprara, G. V., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G. M., Barbaranelli, C., & Bandura, A. (2008). Longitudinal analysis of the role of perceived self-efficacy for self-regulated learning in academic continuance and achievement. *Journal of Educational Psychology*, *100*(3), 525–534. https://doi.org/10.1037/0022-0663.100.3.525

Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods*, *1*(4), 62–83.

Dogan, B. (2015). Educational uses of digital storytelling in K-12: Research results of digital storytelling contest (DISTCO) 2014. In D. Rutledge & D. Slykhuis (Ed.), *Proceedings of SITE 2015—Society for Information technology & teacher education international conference* (pp. 595–604). Las Vegas, NV: AACE.

Gwénaëlle, J., & Usher, E. B. P. (2011). Sources of self-efficacy: An investigation of elementary school students in France. *Journal of Educational Psychology*, *103*(3), 649–663.

Heo, M. (2009). Digital storytelling: An empirical study of the impact of digital storytelling on pre-service teachers' self-efficacy and dispositions towards educational technology. *Journal of Educational Multimedia and Hypermedia*, *18*(4), 405–428.

Honeyford, M. A. (2014). From aquí and allá: Symbolic convergence in the multimodal literacy practices of

adolescent immigrant students. *Journal of Literacy Research*, *46*(2), 194–233.

Ibanez, J., Aylett, R., Ruiz-Rodarte, R. (2003). Storytelling in virtual environments from a virtual guide perspective. *Virtual Reality*, *7*(1), 30–42.

Jewitt, C. (2008). Multimodality and literacy in school classrooms. *Review of Research in Education*, *32*(1), 241–267. https://doi.org/10.3102/0091732X07310586

Jewitt, C. (Ed.). (2009). *The Routledge handbook of multimodal analysis*. London: Routledge.

Klassen, R. M., & Georgiou, G. K. (2008). Spelling and writing self-efficacy of Indo-Canadian and Anglo-Canadian early adolescents. *Journal of International Migration and Integration/Revue de l'integration et de La Migration Internationale*, *9*(3), 311–326.

Klassen, R. (2002). Writing in early adolescence: A review of the role of self-efficacy beliefs. *Educational Psychology Review*, *2*(14), 173–203.

Klassen, R. M. (2004). Optimism and realism: A review of self-efficacy from a cross-cultural perspective. *International Journal of Psychology*, *39*(3), 205–230.

Kress, G. (2000). Multimodality. In M. Cope & B. Kalantzis (Ed.), *Multiliteracies: Literacy learning and the design of social futures*. London: Routledge.

Massaro, D. W. (2012). Multimodal learning. In *Encyclopedia of the Sciences of Learning* (pp. 2375–2378). Boston, MA: Springer.

Ministero dell'Istruzione dell'Università e della Ricerca. (2016). *Piano Nazionale Scuola Digitale* [National Plan Digital School]. Rome: MIUR. Retrieved from http://www.istruzione.it/scuola_digitale/allegati/Materiali/pnsd-layout-30.10-WEB.pdf

Ministero dell'Istruzione dell'Università e della Ricerca. (2017). *Gli alunni stranieri nel sistema scolastico italiano a.s. 2015/2016* [Foreign students in the Italian school system 2015/2016]. Rome: MIUR. Retrieved from http://www.istruzione.it/allegati/2017/Notiziario_alunni_Stranieri_nelsistema_scolastico_italiano_15_16.pdf

Nisbett, R., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice-Hall.

NLG. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Review*, *66*(1), 60–93. https://doi.org/10.17763/haer.66.1.17370n67v22j160u

Ntelioglou, B. Y., Fannin, J., Montanera, M., & Cummins, J. (2014). A multilingual and multimodal approach to literacy teaching and learning in urban education: A collaborative inquiry project in an inner city elementary school. *Frontiers in Psychology*, *5*, 533.

OECD. (2009). Teaching practices, teachers' beliefs and attitudes. In *Creating effective teaching and learning environments: First results from teaching and learning international survey* (pp. 87–135). Paris: OECD Publishing. Retrieved from https://www.oecd.org/education/school/43023606.pdf

OECD–PISA. (2012). *Risultati PISA 2012. Nota paese Italia* [PISA 2012 results. Country note Italy]. Paris: OECD Publishing. Retrieved from https://www.oecd.org/pisa/keyfindings/PISA-2012-results-italy-ITA.pdf

Pajares, F. (2002). Gender and perceived self-efficacy in self-regulated learning. *Theory Into Practice*, *41*(2), 116–125.

Pajares, F. (2003). Self-efficacy beliefs , motivation, and achievement in writing: A review of literature. *Reading & Writing Quarterly*, *2*(19), 139–158.

Redecker, C. (2017). *European framework for the digital competence of educators*. Brussels: European Commision.

Santagati, M., & Ongini, V. (2016). *Alunni con cittadinanza non italiana. La scuola multiculturale nei contesti locali. Rapporto nazionale A.S. 2014/2015* [Pupils with non-Italian citizenship. Multicultural school in local contexts. National report 2014/2015] (Vol. 1/2016). Milano: Fondazione ISMU.

Scaffidi, C., & Chambers, C. (2012). Skill progression demonstrated by users in the Scratch animation environment. *International Journal of Human-Computer Interaction*, *28*(6), 383–398.

Shin, B. J., & Park, H. S. (2008). The effect of digital storytelling type on the learner's fun and comprehension in virtual reality. *Journal of the Korean Association of Information Education*, *12*(4), 417–425.

Stoll-Lillard, A. (2005). *Montessori: The science behind the genius*. Oxford: Oxford University Press.

Tosi, L. (2015). *Il Mercante di Venezia da William Shakespeare* [The merchant of Venice by William Shakespeare]. Roma: Lapis edizioni.

Usher, E. L., & Pajares, F. (2008). Sources of self-efficacy in school: Critical review of the literature and future directions. *Review of Educational Research*, *78*(4), 751–796. https://doi.org/10.3102/0034654308321456

Walsh, M. (2010). Multimodal literacy: What does it mean for classroom practice? *Australian Journal of Language and Literacy*, *33*(3), 211–239.

Wilber, D. J. (2010). Special themed issue: Beyond 'new' literacies. *Digital Culture & Education*, *2*(1), 1–6. Retrieved from http://www.digitalcultureandeducation.com/cms/wp-content/uploads/2010/05/dce_editorial_wilber_2010.pdf

Yoon, T. (2013). Are you digitized? Ways to provide motivation for ELL's using digital storytelling. *International Journal of Research Studies in Educational Technology*, *2*(1), 25–34.

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, *2*(41), 64–70.

About the Authors

Monica Banzato (PhD in Educational Sciences) is a Lecturer and Researcher in Educational Research and Developmental Cognitive Psychology at Ca' Foscari University of Venice. Since 1996, she has been active in the field of educational and training technology—theory and applications. She has participated as a researcher in several EU research projects, including: digital competencies for teachers' educational development; open educational resources/practice; self-efficacy and gender difference in handmade robotics; and digital/media narration for K12.

Francesca Coin is Developmental Psychologist (PhD in Science of Cognition and Education). She collaborates with Ca' Foscari University and the CTS of Venice (Territorial Support Centre for New Technologies in Inclusive Education) where she teaches Developmental Cognitive Psychology in the specialized training for teachers. She is interested in inclusive teaching for foreign students and students with disabilities. She is involved in several digital education research projects for K12, such as the European project SHABEG.

Appendix

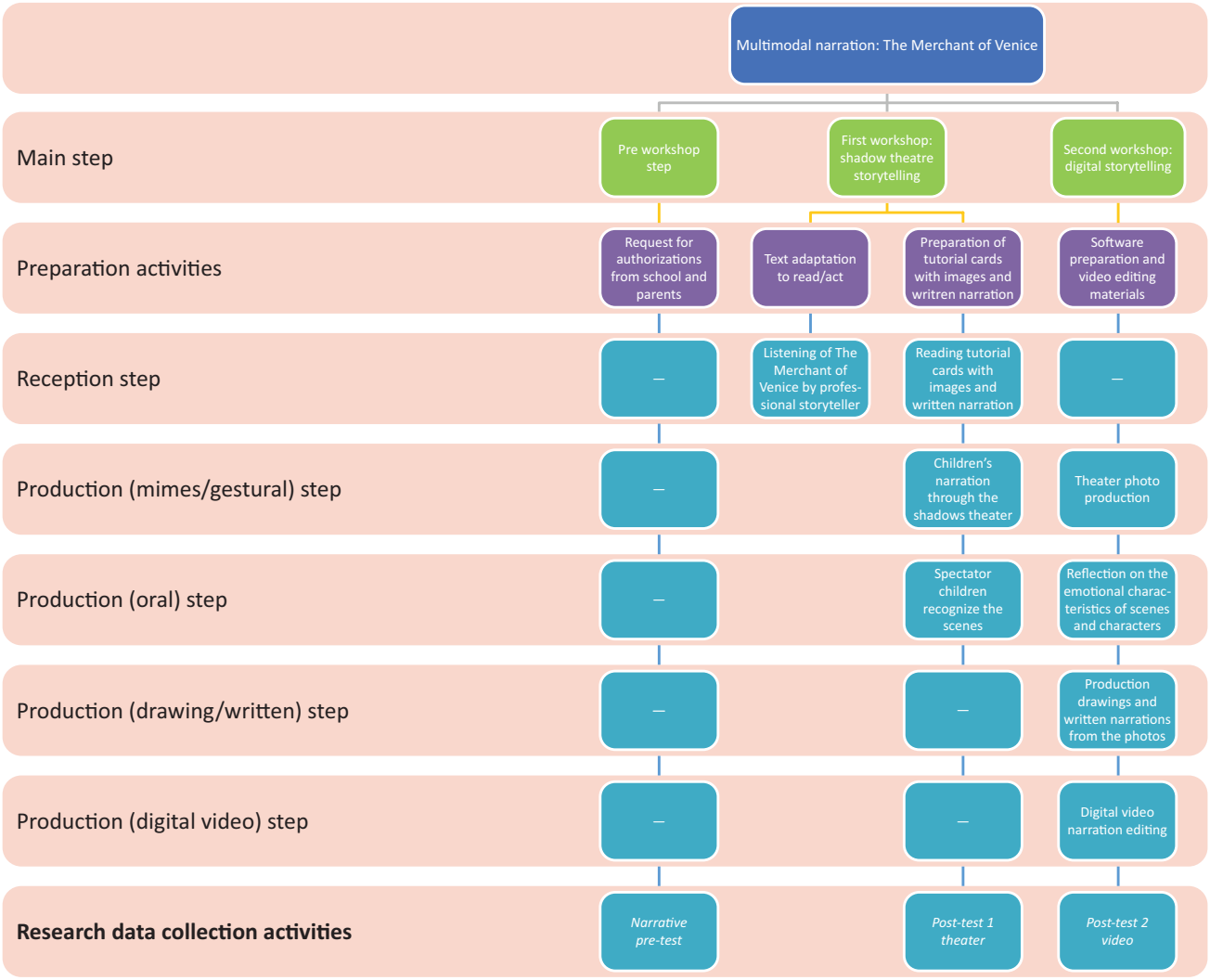


Figure 1. The phases of the exploratory study and the educational narrative workshops.

COGITATIO

Media and Communication (ISSN: 2183–2439)
2019, Volume 7, Issue 2, Pages 160–168
DOI: 10.17645/mac.v7i2.1871

Article

(Un)Healthy Behavior? The Relationship between Media Literacy, Nutritional Behavior, and Self-Representation on Instagram

Claudia Riesmeyer *, Julia Hauswald and Marina Mergen

Department of Media and Communication, LMU Munich, 80538 Munich, Germany; E-Mails: riesmeyer@ifkw.lmu.de (C.R.), Julia.Hauswald@gmx.de (J.H.), marina.mergen@yahoo.de (M.M.)

* Corresponding author

Submitted: 11 December 2018 | Accepted: 23 January 2019 | Published: 11 June 2019

Abstract
The article examines the relationship between media (and health literacy), self-representation, and nutritional behavior of girls who receive nutrition-related content on Instagram. Analyzing this relationship is important because social networks like Instagram can be used as platforms to promote one's nutritional behavior as expression of personality and to interact with others. Countless meal images are posted, and reach a large number of users. With its visual characteristics, Instagram seems predestined for nutrition-related self-representation. Media literacy, one way of raising young people's awareness of the risks of media use, encompasses the skills knowledge, evaluation, and action. If media literacy is transferred to the field of health communication, intersections become apparent. Media literacy is understood as a necessary ability to distinguish credible health information from non-credible health information. Both media and health literacy include the skills knowledge, evaluation, and action. Based on 15 qualitative interviews with girls in the age of 13 to 19, results show the relevance of media and health literacy for nutritional behavior. The girls own background information to classify and evaluate received content. They know that content on Instagram is staged and they reflect about negative effects of staged images. However, these images inspire them for their self-representation and nutritional behavior. They adapt what they see into their own eating habits, adopt trends, and thus act against their knowledge of negative consequences to reach the socially expected body image.

Keywords
health literacy; Instagram; media literacy; nutritional behavior; self-representation

Issue
This article is part of the issue "Critical Perspectives on Digital Literacies: Creating a Path Forward", edited by Hiller A. Spires (North Carolina State University, USA).

1. Introduction

This article examines the relationship between media and health literacy, self-representation, and the nutritional behavior of girls who receive nutrition-related content on Instagram. Analyzing this relationship is important for several reasons: first, social networks, such as Instagram, can be used as platforms to promote one's nutritional behavior as an expression of one's personality and to interact with others. For example, countless users publish pictures of their meals on Instagram with corresponding hashtags (e.g., #cleaneating, with almost 42 million posts), reaching many users worldwide. Half of all young people aged 12–19 use Instagram regularly (JIM, 2017). With its visual characteristics, Instagram seems predestined for users' nutrition-related self-representation.

Second, as adolescents are in the process of developing their personalities (Hurrelmann, 1990) and body consciousness through using media (Havighurst, 1956), social media serves as a "space for experience and a source of orientation" (Schorb, 2014, p. 178). The reception of social media content supports adolescents in forming

their identity and promotes the integration of information into the adolescent's self-concept. The large number of nutrition-related contributions on social networks (Soellner, Huber, Lenartz, & Rudinger, 2009) suggests that the reception of such posts can influence young people's self-concepts. Young women who use Facebook, for example, have significantly higher concerns about body ideals, especially slimness (Tiggemann & Slater, 2013), and the internalization of these body ideals can affect eating behaviors (Sidani, Shensa, Hoffman, Hanmer, & Primack, 2016).

One way of sensitizing adolescents to the risks of their media use is to mediate media and health literacy (Livingstone, 2014). More than 80% of Internet users search online for health information (Fox & Duggan, 2013), which shows the enormous importance of literate handling of such information. Despite the relevance of media and health literacy, little research conducted in the context of nutritional behavior has taken these aspects into account. While some studies have examined the (negative) influence of the use of social media on nutritional behavior (e.g., Beckert-Zieglschmid, 2004; Ging & Garvey, 2018; Holland & Tiggemann, 2017; O'Brien, 2015; Turner & Lefevre, 2017), the influence of media literacy has seldom been researched (e.g., Bergsma & Carney, 2008).

2. Media Literacy: Knowledge, Evaluation, and Action

Media literacy is defined as the ability to reflect on the opportunities and risks of media use (UNESCO, 2016). The differentiation and change in the media landscape over the past several decades have forced us to confront the concept of media literacy, which has "asserted itself in the (cultural) political discourse" (Groeben, 2002, p. 11). While numerous explanations of media literacy exist due to diverse empirical perspectives towards it, all the approaches have a goal orientation in common. Through mediation, the individual without media literacy should be able to use media more competently than before. Prerequisites are the motivation (Pfaff-Rüdiger & Riesmeyer, 2016) and willingness "to act appropriately, self-determined, and creatively with social responsibility" (Tulodziecki, 1998, p. 697). The acquisition of media literacy is a generation-overlapping task, beginning in the childhood with the first media access (e.g., lifelong learning).

Since the possibilities for communicating and acting within the dynamic media world are constantly expanding, adolescents in particular need media literacy to use and present themselves on social media safely (Livingstone, 2014). Media literacy is taught in the media socialization process and is tantamount to lifelong learning (Hurrelmann & Bauer, 2018). Family is the primary agent for imparting media skills, with differences in parental media education determined by parents' age, media literacy, and media use (Livingstone et al., 2017). Schools and friends also act as agents (Buckingham et al., 2005; Hurrelmann & Bauer, 2018; Paek, Reber, & Lariscy, 2011; Theunert & Schorb, 2010). Research often fails to take into account adolescents' participation in media literacy acquisition. In the course of this self-socialization (Arnett, 1995a), adolescents choose media freely and perceive it according to their needs.

Furthermore, media literacy provides a possibility to reflect on and control the (partly negative) effects of media use (Potter, 2004). The critical examination of content and the ability to contextualize media and act in a media environment are essential key qualifications for the acquisition of media messages (Hobbs, 2011). Livingstone and Helsper (2010, p. 257) defined media literacy as "the ability to access, analyze, evaluate, and create messages in a variety of forms" (p. 311). These skills are part of the definition by Schorb (2005), who distinguishes media literacy triangularly, as follows:

- *Knowledge*: consisting of functional and structural (background knowledge about the media system, its functionality, and impact) as well as orientation knowledge (combination of knowledge and evaluation, orientation in a media context, defining and taking up one's own position on the basis of rationalism, ethics, and evaluation);
- *Evaluation*: ethically and cognitively based ability to critically reflect on technical and content offerings (understanding, classifying, accepting or rejecting media and their content);
- *Action*: based on evaluation, consists of the dimensions "media appropriation, use, participation and design" (p. 261).

These three skills can be transferred to health communication because media literacy is considered a necessary skill to assess the credibility of health-relevant information, as the multitude of online sources has increased the amount of information available (both serious and unserious).

3. Health Literacy: Functional, Communicative, and Critical Skills

Since the 1970s, science has been increasingly interested in health literacy (Batterham, Hawkins, Collins, Buchbinder, & Osborne, 2016). While earlier work focused on functional skills such as reading and writing for health-literate information handling, the concept today includes a variety of factors that determine how people find, understand, and deal with relevant information (Parker, Baker, Williams, & Nurss, 1995). The World Health Organization (1998) defines health literacy as "cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health" (p. 10). Health literacy is considered mandatory to have access to and to use health care, to interact with health care providers, to care for one's health and that of

others, and to participate in health discourses and decisions (Batterham et al., 2016; Soellner et al., 2009).

There is a lively debate among health literacy studies about how to define health literacy and regarding the skills that must be evident to be considered literate (Seçkin, Yeatts, Hughes, Hudson, & Bell, 2016). Nutbeam (2000) conceptualized these skills in his much-quoted systematic model of health literacy (Soellner et al., 2009). This model is used in this article for theoretical foundation because it can be combined with Schorb's media literacy model (2005). Nutbeam (2000, p. 263) built his model successively and distinguished between three stages:

1. *Basic/functional literacy*: includes fundamental cognitive skills (focus on reading and writing), necessary for cognitive processing of health-related information;
2. *Communicative/interactive literacy*: combines basic cognitive and social skills, necessary for the extraction and application of information from communicative environments in everyday situations;
3. *Critical literacy*: combines advanced cognitive and social skills, capable of critical analysis of information and to control of one's health related action and behavior.

According to Nutbeam (2000), literacy mediation can start at any of the three levels. During childhood and adolescence, basal patterns of health behavior develop, which stabilize after this period, and basic structures of individual behavior patterns are maintained in adulthood (Langness, Richter, & Hurrelmann, 2005). Since health literacy is regarded as a fundamental factor influencing mental and physical health (Soellner et al., 2009), it is essential to promote it in childhood and adolescence.

4. The Interplay between Media and Health Literacy: State of Research

Empirical research has rarely considered the interplay of media and health literacy in relation to dietary behavior, Instagram use, and literacy mediation; the majority of studies tend to focus more on the relationship between the use of social media and dietary behavior (e.g., Beckert-Zieglschmid, 2004; Miah & Rich, 2008; Sidani et al., 2016). However, most studies deal exclusively with the use of applications and their impact on unhealthy diets (Ging & Garvey, 2018; Holland & Tiggemann, 2017; O'Brien, 2015; Turner & Lefevre, 2017). For example, the use of social media is significantly related to eating disorders. In particular, social networks that link visual elements and peer interactions can increase the risk of eating disorders (Sidani et al., 2016).

Exceptions include the studies by Levin-Zamir, Lemish and Gofin (2011) and Chang et al. (2015), which confirm that media health competence has a positive influence on health-enhancing behavior and nutrition routines, and that functional health competence has a positive effect on health-relevant actions (Chang et al., 2015). Maag (2007) analyzed the relationship between health literacy and nutrition, exercise, and weight, however failed to establish the connection to media literacy, its mediation, and the use of social media, even though the use of social media is integrated into everyday life (especially among young people) and a healthy diet and reaching the social body ideals are relevant for half of Germans (TKK, 2017). Younger people in particular are following nutrition trends (TKK, 2017). Langness et al. (2005) showed that people who routinely eat a healthy diet at a young age are less likely to fall chronically ill later. These dietary routines are influenced by the parents and the independent will of young people during puberty.

5. Research Questions

As can be seen in the representation of the two models, both comprise three stages. Even though Schorb's (2005) model is triangular and Nutbeam's (2000) model is successive, similarities are evident. Both models comprise knowledge, evaluation, and action, which can be combined and defined as follows:

- *Knowledge*: functional health literacy (background knowledge, processing of health information to generate knowledge, and awareness of mediality);
- *Evaluation*: critical health literacy (critical reflection and control over own health-related actions and behavior);
- *Action*: communicative, interactive literacy (appropriation of knowledge, social interaction with others, self-representation, and nutritional behavior).

Based on existing research, this article aims to answer the following research questions:

RQ1: What is the origin of media literacy and nutritional knowledge among young social media users (mediation of skills)?
RQ2: What constitutes the awareness of mediality and the interpretation nutritional-related Instagram posts among young people?
RQ3: What is the relationship between the receptions of nutritional-related Instagram posts on young users' nutritional behavior?
RQ4: How do young users evaluate and critically reflect on the reception of nutritional contributions?
RQ5: What is the relationship between users' nutritional behavior and self-representation on Instagram?

6. Method: Qualitative Interviews

To answer the research questions, we conducted 15 qualitative interviews with girls aged 13–19 in May and June 2018. This age group was selected because Instagram is one of their used apps (JIM, 2017), and girls are par-

ticularly susceptible to eating disorders (Meier & Gray, 2014). In addition, during this period adolescents shift their interests as well as their orientation on socialization agents (from family to peers; Arnett, 2007; Grusec, 2002). To investigate possible influences on nutritional behavior, the inclusion criterion for selected participants was the active use of an Instagram account. The interviewees were recruited using theoretical sampling (Kvale & Brinkman, 2009; Mason, 2018) and we recruited them for the interviews through personal contacts (e.g., sports clubs and youth centers). Table 1 presents an overview of the sample characteristics. The face-to-face interviews were held either at the respondents' homes, in cafés, or at LMU Munich.

The aforementioned dimensions of knowledge, evaluation, and action were operationalized and transferred into the interview guidelines (Table 2). The category "everyday life" was included to establish relationships with nutrition and Instagram use. The guided questions were asked in a flexible order to give the greatest possible freedom for the answers, but also to ensure that no aspect was forgotten. In addition to openness, familiarity during the interview was important because nutritional behavior is a sensitive and personal topic. The guide comprised 19 main questions and some following-up questions. In addition, the participants were given a primary task to encourage them to think aloud. In the task, the participants were shown up to four real Instagram posts of healthy food to prompt their reflections on other peoples'—and their own—nutritional behavior, to determine the importance they might attach to it, and to discuss whether they would publish similar images (self-representation).

The interviews were conducted face-to-face, recorded, transcribed, anonymized, and analyzed using a theory-driven approach. At first, the transcripts were cleared of digressive or misleading text passages and relevant sections were inserted in tabular form under corresponding categories. Should a new aspect arise that could not be classified in any of the deductively formed categories, another subcategory was inductively formed. This procedure was followed by a linguistic and content reduction of the text passages that made generalizing statements and to filter findings from the material.

Table 1. Sample characteristics.

Name	Age	Educational status
Anna	17	Pupil (Secondary Modern School)
Barbara	19	Student (University)
Charlotte	16	Pupil (Secondary School)
Diana	17	Pupil (High School)
Eva	19	Apprentice
Felizitas	19	Pediatric nurse
Gina	17	Pupil (High School)
Hannah	13	Pupil (Secondary School)
Ida	15	Pupil (High School)
Julia	13	Pupil (High School)
Klara	15	Pupil (High School)
Luise	14	Pupil (High School)
Martha	14	Pupil (Secondary Modern School)
Nora	15	Pupil (High School)
Olivia	14	Pupil (High School)

Note: The transcripts were anonymized, and participants were given a generic name, which matches the in-text quotation and mentions.

7. Results

A clear picture emerged regarding the participants' use of Instagram: social media, especially Instagram, plays an enormous role in the everyday life of the teenage girls. Instagram has taken such an important place in the lives of all participants that they begin their day by opening the app and end their day by closing it. The social network In-

Table 2. Category system.

Category	Operationalization
Everyday life	• Daily routines, hobbies, leisure time. • Instagram use (active, passive use, followed accounts, privacy). • Nutrition (daily routines).
Knowledge	• Background knowledge about Instagram and its functionalities (e.g., hashtags, content staging, and manipulation). • Processing of health information to generate knowledge. • Awareness of mediality (knowledge of norms, fiction vs. reality on Instagram). • Mediation of knowledge concerning nutrition (e.g., family, peers, influencer).
Evaluation	• Critical reflection (positive and negative effects of Instagram use and on nutritional behavior). • Control over own health-related actions and behavior. • Importance and appraisal of healthy and unhealthy nutrition behavior.
Action	• Appropriation of knowledge. • Social interaction with others. • Self-representation (orientation and influences, perception presentation of others). • Nutritional behavior (orientation and influences).

stagram therefore functions as a constant companion for the girls and is used several times a day, particularly during times of boredom or on the road, and even at school or work.

7.1. Link between the Origins of Media Literacy and Nutritional Knowledge

The participants showed similar Instagram usage in their everyday lives. They had all encountered the "typical" food images on Instagram, presenting healthy food, and while the participants' friends and acquaintances posted nutritional images on Instagram to illustrate the nutritional value of food, the participants claimed that the majority of nutritional contributions on Instagram came from celebrities or professional fitness bloggers. The majority of young people are confronted with food contributions that are staged, published, and accessible online. Even though parents often teach media literacy (Arnett, 1995b, 2007; Livingstone & Blum, 2018), their knowledge acquisition of hashtags or Instagram use appeared to be limited. Even if the parents were clear about the meaning and use of a hashtag, the participants reported that they taught themselves how to use them when they started using Instagram or another social media. Martha (14) emphasized her active role in the acquisition of knowledge:

> At the beginning, when I didn't know Instagram that well, I found out. Or, for example, in the stories, they sometimes mention "there is this and the hashtag". And that's when I found out what a hashtag is and how to use it.

The realization that knowledge about hashtags is socialized can also be explained by the fact that the majority of families have no rules regarding Instagram use because the parents do not use the platform and thus lack knowledge of it (e.g., self-socialization; Blum-Ross et al., 2018; Lewis, 2014).

The participant girls also had similar nutritional knowledge. For most of them, healthy eating referred to eating freshly cooked meals prepared with fruit and vegetables, and many mentioned that eating healthily involved restricting sugar and fast food consumption. The girls' nutritional behavior seemed to be identical: most girls described their eating habits as 'normal' and claimed that their habits could depend on phases in their lives. For example, they eat what tastes good, sometimes sweet or unhealthy. Some girls follow certain diets, such as vegetarian or vegan diets; and if they do more sport, they often pay closer attention to ensuring they eat a healthy diet (e.g., "If I have a sport phase right now, then I really try to pay attention to my eating habits", Eva, 19). They described a healthy diet as a mean to achieving their desired body, and they often automatically linked body images with a healthy diet. Among the girls interviewed, this link and theses food habits played an important role in everyday life.

When asked how they knew what healthy eating means, it became clear that parents and teachers are particularly important for this knowledge transfer. The offline social environment, particularly the family, has a significant influence on nutritional behavior because the girls mainly eat at home and their meals (choice of food, composition and meal times) are determined by their parents. The exchange of nutritional information is also increasingly taking place within the close family environment:

> My big brother pushed me so much from a nutritional point of view because he dealt with it a lot. I know a lot about him and he always says: "Do that and that's good." But he gets the information, and he doesn't even have Instagram. (Felizitas, 19)

However, some girls claimed to have acquired knowledge about nutrition through traditional and social media. Julia (13), for example, told of lifestyle bloggers on Instagram who "always share their food or fitness stuff". Thus, self-socialization also plays a role in the acquisition of nutritional knowledge.

Overall, the results of the interviews show that the sources of knowledge of media competence and nutritional behavior overlap to some extent (RQ1). Knowledge-related media literacy with regard to hashtags is acquired almost exclusively through independent learning. At the same time—at least in a minority—self-acquisition of nutritional knowledge takes place, which at least partly proves a common origin of knowledge. Nevertheless, the parental home and the school remain the largest knowledge mediators for young people when it comes to healthy and possible unhealthy nutrition.

7.2. Link between Mediality Awareness and the Interpretation of Nutrition-Related Instagram Posts

An analysis of the evaluation of media literacy and nutritional behavior showed that the participants were aware that Instagram contributions are part of a media construction and are thus largely staged. They also noted that, in some cases, many posts falsely suggest through their aesthetic presentation that the represented dishes are healthy. In this context, the participant girls reported that Instagram is the platform on which perfectionism and staging dominates, since nothing is portrayed as it is in reality, and only the best and most beautiful images are posted. Accordingly, the participants possess the ability to distinguish media constructions and distortions from reality. They explained their assessment by saying the dishes were too perfect and that preparing such dishes was too time-consuming for everyday life. By comparing their eating behaviors with the Instagram contributions, the participants tended to deduce that the staging of professional Instagram bloggers does not correspond to reality. The majority of the girls assumed that Instagrammers do not eat healthy food as consistently as

their Instagram profiles suggest:

> I think, if you post only such posts, I find that somehow a lie because there is no person who really only eats healthily. So, I can't imagine that. There are all these people who have such fitness sites, but there are certainly days when they eat chocolate or something. (Diana, 17)

Moreover, the majority of girls are confident that dishes are arranged exclusively for posting on Instagram, which in turn relates to a lack of credibility regarding the nutritional behavior of food bloggers. From this feedback, it can be concluded that the participants' awareness of mediality has a significant impact on young people's interpretation of nutritional content presented and staged on Instagram (RQ2). The awareness of mediality helps the girls to distinguish between their reality and the reality constructed by the media.

7.3. Link between the Reception of Nutritional-Related Instagram Posts and Nutritional Behavior

To what extent does Instagram use relate to individual dietary behavior? An analysis of the participants' actions as a component of media literacy and nutritional behavior showed that many participants actively use Instagram and post food photos in their Instagram story. However, not only the posting of food pictures is relevant. Many of the respondents are inspired to try out the dishes presented by the people they follow. Nutritional pictures on the social network also serve as inspiration and motivation for a healthier diet. Notably, the discussion participants consciously integrate individual nutrition trends from Instagram into their everyday eating behavior (e.g., trying chia seeds, Felizitas, 19). Instagram posts from vegan dishes, for example, inspired Nora (15):

> I always looked at the pictures first and then the comments....There were many dishes that convinced me; it also tastes good when you eat vegan, have a healthier eating behavior and can still eat delicious things.

The use of Instagram and the confrontation with images of healthy eating leads to the assumption among the participants that their diet is healthier today than it was in the past.

Nutrition-related posts on Instagram was found to have an effect on the girls (RQ3) because they tended to try out ideas they had obtained from social networks. The participants were able to recognize and verbalize this connection, and the majority of the girls were actively integrating a healthier diet into their everyday lives by, for example, planning to eat less in the evening or to include more fruit and vegetables in their meal plans—inspired by Instagram. Thus, a connection was evident between the actions on Instagram and the participants' dietary behavior.

7.4. Link between Evaluation and Critical Reflection of the Reception of Food Contributions

An analysis of the positive and negative effects of the nutritional contributions showed that all interviewees recognized, on reflection, the negative influence of Instagram use on their everyday behavior. The participants viewed self-esteem and inferiority complexes as possible consequences of Instagram contributions that can have serious effects (e.g., eating disorders). They attribute this outcome to the fact that most people want to belong to the majority. As Instagram gives the impression that everyone (especially the influencer the girls follow) eats healthily, this assumption makes young people feel guilty about their diet. However, it is striking that healthy eating is not primarily associated with attributes of health and that the main reason for many girls to eat healthily is to get a slim body or look as good as others on Instagram: "I think that the photos influence some...somehow indirectly....You just sit with the chip bag in front of it (in front of the smartphone) and see that and somehow get a guilty conscience" (Eva, 19).

By contrast, the participants claimed that Instagram has besides negative effects Instagram also has a positive influence on self-esteem—because positive feedback and "likes" can increase self-esteem—and on motivating them to participate in sports or other activities. They claimed that the food pictures lead them to make comparisons with their diet, but in a positive sense, because seeing healthy meals motivates them to reconsider and adapt their nutritional behavior. Regarding the influence of Instagram, Anna (17) explained:

> Not have to change, but rather want to change. So, I think if you see healthy food and the food looks delicious—because the pictures look nice—then you think: "Yes then I can eat that too, so to speak".

In summary, it can be said that the participants are able to make critical evaluations about the received content and can identify contributions that are far removed from reality, which is a decisive component of media competence (RQ4). The participants also have the ability to understand and verbalize the possible dangers of the nutritional contributions.

7.5. Link between Nutritional Behavior and Self-Representation

An analysis of the categories of nutritional behavior (everyday life) and self-representation reveals a clear picture that the girls like to stage pictures of themselves, of them and their friends, and of their holidays. Food pictures play a marginal role in their self-representation. As their pictures are uploaded in the form of stories and are only available for a short period, they do not represent a long-term self-portrayal. The online placement of food pictures by non-celebrities is often viewed nega-

tively. Diana (17) tells of friends: "they only upload food stuff and that somehow bothers me. Well, I don't know, I like to see something else. Instagram isn't just there to upload food pictures".

Food pictures seem to serve as an orientation for individual eating behaviors, but they do not have a great influence on an individual's self-portrayal on the Internet. A possible reason for this is that young people mainly receive staged food pictures of well-known personalities, and the pressure to reach this ideal seems to be too high to expose oneself to it. Notably, girls who follow a particular diet tend to present their diet more strongly than others do on Instagram and use food pictures for self-representation. For example, Nora (15), who is vegan, is an example for this result: "[I post food photos] as often as I cook". From this feedback, it can be concluded that young people who have a pronounced identification with a dietary style are more likely to share it on social media and present themselves accordingly. Although young people adopt nutritional trends in their everyday eating habits, the participants who tended to eat 'normally' gave the impression that they also want to communicate this to the outside world (RQ5).

8. Discussion

The results show the relevance of media and health literacy in the nutritional behavior of adolescent girls. The importance of parents as the first socialization agent and of young people themselves in terms of self-socialization becomes clear. Their eating behavior is influenced by their parents, although there are differences in the nutritional information (Maag, 2007). It is therefore essential to promote health education because it lays the foundations for healthy eating behavior in childhood (Das et al., 2017) and promotes health literacy (Nutbeam, 2000, 2008). Furthermore, adolescents often acquire media knowledge by themselves because of the parents' non-use or incomprehension. The girls are confronted almost daily with nutritional content on Instagram and receive contributions from professional sports bloggers or celebrities. These contributions often propagate a healthy lifestyle and present body ideals, and the girls automatically associate body ideals with a healthy diet. However, the reception of food or body images raises the pressure to adapt to these ideals, which leads to a negative perception of these images. The mass of nutritional information on Instagram leads girls to attach great importance to nutrition and to regard healthy eating as a target component for a good figure. Nevertheless, Instagram use can also have a positive impact on health literacy because the food posts introduce girls to new foods and encourage them to reflect on their food composition, even if it does not necessarily lead to a change in dietary behavior (Chang et al., 2015; Levin-Zamir et al., 2011).

The girls rely on their own background information to classify and evaluate received content (staging, self-representation, production conditions of celebrities' posts). They know that content shared on Instagram does not reflect "reality". However, as the staged images are more popular than non-staged ones, and the girls reflect on the negative effects of staged images, these images inspire their self-representation and nutritional behavior because they adapt what they see into their eating habits, adopt trends, and even act against their knowledge of negative consequences to reach the socially expected body image and socially expected type of Instagram images, too. In adapting nutrition trends to everyday eating habits, the general involvement (personal interests in Instagram) and the choice of role models used for one's identity adaptation seem to play a role. The interviews showed that through evaluative self-literacy, the young girls were aware of the effects of receiving nutritional content and could assign the resulting eating habits to the online content. Media literacy is thus decisive for a health-competent handling of online messages. However, media and health literacy do not automatically lead to healthier eating habits among young girls because, despite their knowledge of healthy nutrition and media functionalities, they act against this knowledge and allow their eating habits to be influenced.

Conflict of Interests

The authors declare no conflict of interests.

References

Arnett, J. J. (1995a). Adolescents' use of media for self-socialization. *Journal of Youth and Adolescence*, *24*(5), 519–533.

Arnett, J. J. (1995b): Broad and narrow socialization: The family in the context of a cultural theory. *Journal of Marriage and the Family*, *57*(3), 617–628.

Arnett, J. J. (2007). Socialization in emerging adulthood. In J. E. Grusec & P. D. Hastings (Eds.), *Socialization. Theory and research* (pp. 208–231). New York, NY: The Guilford Press.

Batterham, R. W., Hawkins, M., Collins, P. A., Buchbinder, R., & Osborne, R. H (2016). Health literacy: Applying current concepts to improve health services and reduce health inequalities. *Public Health*, *132*, 3–12.

Beckert-Zieglschmid, C. (2004). Individualisiertes Gesundheitsverhalten? Soziale Strukturen, Peereinflüsse und Lebensstile als Einflussfaktoren des Ernährungsverhaltens Jugendlicher [Individualized health behavior? Social structures, peer influences and lifestyles as influencing factors of nutritional behavior of young people]. *Sozial- und Präventivmedizin*, *50*(4), 206–217.

Bergsma, L. J., & Carney, M. E. (2008). Effectiveness of health-promoting media literacy education: A systematic review. *Health Education Research*, *23*, 522–542.

Blum-Ross, A., Donoso, V., Dinh, T., Mascheroni, G., O'Neill, B., Riesmeyer, C., & Stoilova, M. (2018). *Look-*

ing forward: Technological and social change in the lives of European children and young people. Report for the ICT coalition for children online. Brussels: ICT Coalition.

Buckingham, D., Banaji, S., Burn, A., Carr, D., Cranmer, S., & Willet, R. (2005). *The media literacy of children and young people*. London: Centre for the Study of Children, Youth and Media. Retrieved from http://discovery.ucl.ac.uk/10000145/1/Buckinghammedialiteracy.pdf

Chang, F.-C, Chiu, C.-H., Chen, P.-H., Miao, N.-F., Lee, C.-M., Chiang, J.-T., & Pan, Y. C. (2015). Relationship between parental and adolescent ehealth literacy and online health information seeking in Taiwan. *Cyberpsychology, Behavior, and Social Networking*, *18*(10), 618–624.

Das, J. K., Salam, R. A., Thornburg, K. L., Prentice, A. M., Campisi, S., Lassi, Z. S., . . . & Bhutta, Z. A. (2017). Nutrition in adolescents: Physiology, metabolism, and nutritional needs. *Annals of the New York Academy of Sciences*, *1393*, 21–33.

Fox, S., & Duggan, M. (2013). Health online 2013. *Pew Research Center*. Retrieved from www.pewinternet.org/2013/01/15/health-online-2013

Ging, D., & Garvey, S. (2018). "Written in these scars are the stories I can't explain": A content analysis of pro-ana and thinspiration image sharing on Instagram. *New Media & Society*, *20*(3), 1181–1200.

Groeben, N. (2002). Anforderungen an die theoretische Konzeptualisierung von Medienkompetenz [Requirements for the theoretical conceptualisation of media literacy]. In N. Groeben & B. Hurrelmann (Eds.), *Medienkompetenz. Voraussetzungen, Dimensionen, Funktionen* (pp. 11–24). Weinheim: Juventa.

Grusec, J. (2002). Parental socialization and children's acquisition of values. In M. Bornstein (Ed.), *Handbook of parenting* (pp. 143–168). Mahwah: Erlbaum.

Havighurst, R. J. (1956). Research on the developmental-task concept. *The School Review*, *64*(5), 215–223.

Hobbs, R. (2011). The state of media literacy: A response to Potter. *Journal of Broadcasting & Electronic Media*, *55*(3), 419–430.

Holland, G., & Tiggemann, M. (2017). "Strong beats skinny every time": Disordered eating and compulsive exercise in women who post fitspiration on Instagram. *International Journal of Eating Disorders*, *50*(1), 76–79.

Hurrelmann, K. (1990). Parents, peers, teachers, and other significant partners in adolescence. *International Journal of Adolescence and Youth*, *2*, 211–236.

Hurrelmann, K., & Bauer, U. (2018). *Socialization during the life course*. Oxon: Routledge.

JIM. (2017). *Jugend, information, (multi)-media* [Youth, information, and (multi)-media]. Stuttgart: mpfs.

Kvale, S., & Brinkmann, S. (2009). *Interviews. Learning the craft of qualitative research interviewing*. London: Sage.

Langness, A., Richter, M., & Hurrelmann, K. (2005). Gesundheitsverhalten im Jugendalter: Ergebnisse der internationalen „Health Behaviour in School-aged Children"-Studie [Health behavior in adolescence: Results of the international "Health Behavior in School-aged Children" study]. *Gesundheitswesen*, *67*, 422–431.

Levin-Zamir, D., Lemish, D., & Gofin, R. (2011). Media health literacy (MHL): Development and measurement of the concept among adolescents. *Health Education Research*, *26*(2), 323–335.

Lewis, B. (2014). *Raising children in a digital age*. Oxford. Lion Hudson.

Livingstone, S. (2014) Developing social media literacy: How children learn to interpret risky opportunities on social network sites. *Communications. The European Journal of Communication Research*, *39*(3), 283–303.

Livingstone, S., & Blum, A. (2018). Parenting for a digital future…The book! *Parenting for a Digital Future*. Retrieved from http://blogs.lse.ac.uk/parenting4digitalfuture/2018/11/07/parenting-for-a-digital-future-the-book

Livingstone, S., & Helsper, E. (2010). Balancing opportunities and risks in teenagers' use of the internet: The role of online skill and internet self-efficacy. *New Media & Society*, *12*(2), 309–329.

Livingstone, S., Ólafsson, K., Helsper, E. J., Lupiáñez-Villanueva, F., Veltri, G. A., & Folkvord, F. (2017). Maximizing opportunities and minimizing risks for children online: The role of digital skills in emerging strategies of parental mediation. *Journal of Communication*, *67*, 82–105.

Maag, D. (2007). *Gesundheitskompetenz bezüglich Ernährung, Bewegung und Gewicht* (Unpublished doctoral dissertation) [Health literacy with regard to nutrition, exercise, and weight]. Lugano: Università della Svizzera italiana. Retrieved from http://doc.rero.ch/record/7981/files/?ln=en

Mason, J. (2018). *Qualitative researching*. London: Sage.

Meier, E. P., & Gray, J. (2014). Facebook photo activity associated with body image disturbance in adolescent girls. *Cyberpsychology, Behavior, and Social Networking*, *17*(4), 199–206.

Miah, A., & Rich, E. (2008). *The medicalization of cyberspace*. London: Routledge.

Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International*, *15*(3), 259–267.

Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science & Medicine*, *67*(12), 2072–2078.

O'Brien, K. (2015). *The cultivation of eating disorders through Instagram* (Unpublished master's dissertation). Tampa, FL: University of South Florida. Retrieved from http://scholarcommons.usf.edu/cgi/viewcontent.cgi?article=7200&context=etd

Paek, H.-J., Reber, B. H., & Lariscy, R. W. (2011). Roles of interpersonal and media socialization agents in ado-

lescent self-reported health literacy: A health socialization perspective. *Health Education Research*, *2*(1), 131–149.

Parker, R. M., Baker, D. W., Williams, M. V., & Nurss, J. R. (1995). The test of functional health literacy in adults. *Journal of General Internal Medicine*, *10*(10), 537–541.

Pfaff-Rüdiger, S., & Riesmeyer, C. (2016). Moved into action. Media literacy as social process. *Journal of Children and Media*, *10*(2), 164–172.

Potter, J. W. (2004). *Theory of media literacy: A cognitive approach*. Thousand Oaks, CA: SAGE Publications.

Schorb, B. (2005). Medienkompetenz [Media literacy]. In J. Hüther & B. Schorb (Eds.), *Grundbegriffe Medienpädagogik* (pp. 257–262). München: kopaed.

Schorb, B. (2014). Identität und Medien [Media and indentity]. In A. Tillmann, S. Fleischer, & K.-U. Hugger (Eds.), *Handbuch Kinder und Medien* (pp. 171–180). Wiesbaden: Springer.

Seçkin, G., Yeatts, D., Hughes, S., Hudson, C., & Bell, V. (2016). Being an informed consumer of health information and assessment of electronic health literacy in a national sample of internet users: Validity and reliability of the e-HLS instrument. *Journal of Medical Internet Research*, *18*(7), 1–25.

Sidani, J. E., Shensa, A., Hoffman, B., Hanmer, J., & Primack, B. A. (2016). The association between social media use and eating concerns among US young adults. *Journal of the Academy of Nutrition and Dietetics*, *116*, 1465–1472.

Soellner, R., Huber, S., Lenartz, N., & Rudinger, G. (2009). Gesundheitskompetenz—Ein vielschichtiger Begriff [Health literacy—a multidimensional term]. *Zeitschrift für Gesundheitspsychologie*, *17*, 105–113.

Theunert, H., & Schorb, B. (2010). Sozialisation, Medienaneignung und Medienkompetenz in der mediatisierten Gesellschaft [Sozialization, media appropriation, and media literacy in the mediatized society]. In M. Hartmann & A. Hepp (Eds.), *Die Mediatisierung der Alltagswelt* (pp. 243–254). Wiesbaden: VS.

Tiggemann, M., & Slater, A. (2013). NetGirls: The internet, Facebook, and body image concern in adolescent girls: The internet and body image concern. *International Journal of Eating Disorders*, *46*(6), 630–633.

TKK. (2017). *TK-Studie zur Ernährung 2017. Iss was, Deutschland* [TK-Study on nutrition 2017. Iss was, Germany]. Retrieved from https://www.tk.de/resource/blob/2009654/1ce2ed0f051b152327ae3f132c1bcb3a/tk-ernaehrungsstudie-2017-data.pdf

Tulodziecki, G. (1998). Entwicklung von Medienkompetenz als Erziehungs- und Bildungsaufgabe [Development of media literacy as an educational task]. *Pädagogische Rundschau*, *52*(6), 693–709.

Turner, P. G., & Lefevre, C. E. (2017). Instagram use is linked to increased symptoms of orthorexia nervosa. *Eating and Weight Disorders*, *22*, 277–284.

UNESCO. (2016). Media and information literacy. *UNESCO*. Retrieved from http://www.unesco.org/new/en/communication-and-information/media-development/media-literacy/mil-as-composite-concept

World Health Organization. (1998). *Health promotion glossary*. Geneva: World Health Organization. Retrieved from http://www.who.int/healthpromotion/about/HPR%20Glossary%201998.pdf?ua=1

About the Authors

Claudia Riesmeyer is a Postdoctoral Researcher at LMU Munich, Department of Media and Communications. Her research fields include media literacy conceptualization, the mediation of media literacy, and effects of missing media literacy. Furthermore, she is interested in qualitative methods.

Julia Hauswald completed her bachelor's degree in Communication Studies, in 2018, at LMU Munich (Department of Media and Communications). She is interested in health communication, adolescents' mobile media use and their media literacy skills, and self-representation.

Marina Mergen completed her bachelor's degree in Communication Studies, in 2018, at LMU Munich (Department of Media and Communications). She is interested in health communication, adolescents' mobile media use and their media literacy skills, and self-representation.

Media and Communication (ISSN: 2183-2439)

Media and Communication is an international open access journal dedicated to a wide variety of basic and applied research in communication and its related fields. It aims at providing a research forum on the social and cultural relevance of media and communication processes.

www.cogitatiopress.com/mediaandcommunication

COGITATIO