Planning for Literacy Instruction: An Evaluation of Online Resources Used by Preservice Teachers

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This study examined the types of online resources preservice teachers used when planning for their literacy instruction and whether the identified resources are research based. An online survey was distributed to preservice teachers enrolled in a literacy education course. Results reveal that participants ($N = 77$) use a mix of research-based professional resources, popular search engines, and content-sharing networks. Reasons for use included accessibility and convenience, content variety, visual aesthetics, literacy content, and source credibility. This research has implications for teacher educators and associate teachers, who are often the first to disseminate information to preservice teachers about effective literacy practices.

Accessible and research-based online resources can offer all teachers, and especially novice elementary teachers, with information about effective literacy practices. Preservice teachers, in particular, are only beginning to learn about content and pedagogical knowledge in their initial teacher education programs and can access the Internet to informally engage with material and collaborate with teachers globally to gain additional insights into teaching-related issues or to answer specific questions they have about instructional techniques (Donohoo & Velasco, 2016).

A plethora of literacy-oriented resources exist online, but no one way exists of ensuring that these resources stem from credible sources and contain research-based information. Literacy educators, school administrators, and workshop leaders can examine and recommend resources; however, the many varied sources providing accessible online material, including educational institutions, public and private agencies, and educators themselves, are of concern.

As preservice teachers use online resources to plan for literacy instruction, answer questions about student needs, and engage with other teachers through content-sharing networks and social media forums, they can encounter an overwhelming number of possible resources from which to choose. Like any self-directed online learner, teachers who use the Internet to seek out information related to their literacy practice must continuously assess and evaluate source features (e.g., website author) and the mode of information delivery (e.g., text or video). This type of critical evaluation is essential to obtaining high-quality research-based information.

A study that examined practicing teachers' thought processes as they used a professional development website to seek out information related to their literacy practice showed that this type of critical evaluation during online learning does occur (Beach, 2017). However, studies that have examined preservice teachers' online search behaviors have shown that online material is often selected on the basis of the resource offering a limited amount of text and being written by a teacher (Laverty et al., 2008; Lee et al., 2012; Shapiro et al., 2019). Furthermore, studies have indicated that information accessed by preservice teachers online is not always supported by research (Lee et al., 2012; McClure & Clink, 2009).

While these studies contribute to a growing understanding of preservice teachers' decision-making during planning, they are broad in their objectives and teaching domains. The aim of this study, therefore, was threefold: (a) to identify online resources used by elementary preservice teachers for planning and instruction in the context of literacy education, (b) to evaluate the quality of the identified online resources, and (c) to identify reasons why preservice teachers use particular online resources when planning for literacy instruction.

Literature Review

This study was framed by the literature on teacher planning and cognition, a discussion of which begins this section. Next is a review of studies that have examined different types of informal online learning environments. A discussion of literacy education, which was the context for the current study, ends this review.

Teacher Planning and Cognition

As teachers plan for instruction they combine intentions and goals to form meaningful decisions about their students' learning (Borko et al., 1981). Teacher planning is a complex cognitive process and involves teachers' thoughts, judgements, and decisions prior to, during, and after

classroom interactions (Lai & Lam, 2011). These processes guide teachers' thinking and projections for further classroom interaction (Fang, 1996).

In the context of literacy, teacher decision-making has been studied in the moment (during guided reading lessons; e.g., Griffith, 2017), prior to instruction (the way teachers would plan a literacy block; e.g., Beach, 2017; Spear-Swerling et al., 2016), and in evaluating student work (e.g., Griffith & Lacina, 2018). In studies such as these, teachers' knowledge of literacy development and instruction plays a significant role in their decision-making process.

For instance, Spear-Swerling et al. (2016) examined elementary teachers' preferences when planning for literacy instruction. They found that many teachers in their study omitted important components of early literacy in their planning (including vocabulary and phonemic awareness) and allocated time for literacy instruction in ways that were inconsistent with research-based recommendations. The authors suggested that teachers in their study lacked the requisite prior knowledge necessary to effectively implement a beginning literacy program.

Griffith (2017) found that most of her preservice teacher participants focused on key literacy instructional components (e.g., supporting comprehension and decoding strategies) during their in-the-moment decision making processes. Griffith's findings suggested that the preservice teachers in her study drew upon pedagogical knowledge and pedagogical content knowledge to make decisions during instruction.

Similarly, a study that examined teachers' decision-making processes during a self-directed online learning experience, showed that participants' navigational decisions and their selection of web-based material were heavily based on their current literacy practices, classroom learning goals, and student needs (Beach, 2017). Participants continuously planned for their literacy instruction as they navigated online.

Teacher planning plays a crucial role in linking content knowledge, curriculum, and instruction (Clark & Yinger, 1977). Gathering, organizing, interpreting, and evaluating information are all involved during the planning process. Planning involves the ability to think critically about new material and construct meaning that is personally relevant.

In online environments, teachers must negotiate between meaningful and irrelevant information and make decisions about which material is worthwhile to pursue. They must contemplate the relevance of the content with respect to their unique teaching context and student needs, while at the same time they must consider the readability of the interface and evaluate the quality of the content. These decisions and cognitive processes often take place during informal online learning.

Informal Online Learning

The demand for informal online learning opportunities has driven institutions and organizations to refine existing learning platforms and

develop new technologies for self-directed learners. In their review of informal teacher learning, Kyndt et al. (2016) outlined nine types of informal learning environments in which teachers engage with regularly. For the purposes of this study, online communities, professional development websites, and blog environments are three types of informal learning environments that can provide teachers who self-direct their learning online with meaningful learning experiences that directly relate to their practice.

Online Communities

Online communities, also known as personal learning networks, are considered to be active, authentic, and informal online learning environments offering peer support and guidance about meaningful topics and issues (Booth, 2012; Duncan-Howell, 2010; Trust, 2016). The time teachers commit to online communities is high, with one study reporting 1-3 hours per week of teacher engagement (Duncan-Howell, 2010).

Recently, social media platforms have taken on the role of online professional learning communities (Carpenter & Krutka, 2015; Krutka, Capenter, & Trust, 2016; Tour, 2017; Visser et al., 2014).

In particular, Twitter has become an increasingly popular mode of informal learning for teachers (Hsieh, 2017; Mullins & Hicks, 2019). Several studies have examined the extent to which Twitter and other content-sharing networks are used as professional development tools (Carpenter & Krutka, 2015; Colwell & Hutchison, 2018; Evans, 2015; Rehm & Notten, 2016; Shapiro et al., 2019; Visser et al., 2014) and in teacher education programs (Hsieh, 2017; Mullins & Hicks, 2019). Twitter chats and the use of hashtags (e.g., #literacylearning and #EDchat) allow users to share ideas and resources and connect with other teachers globally (Carpenter & Krutka, 2015). Teachers who use Twitter as a learning tool report using the platform multiple times a day as a means of their professional learning (Visser et al., 2014).

In a recent study that surveyed elementary mathematics teachers about their use of online resources, Shapiro et al. (2019) found that, despite having years of teaching experience, survey respondents said that social media sites, including Pinterest and Teachers Pay Teachers, were websites most often accessed when seeking out material for their practice. Given that these types of social media platforms are for-profit websites, the authors highlight the critical importance for teachers to "consider the quality of resources and carefully look for misconceptions [and] invalid mathematical concepts" (Shapiro et al., 2019, p. 682). Single textbooks that might have been used in the past are no longer the sole resource that teachers use to guide their practice. Online material that varies in quality and credibility is accessible to teachers and needs to be considered through a critical lens.

Professional Development Websites

Professional development (PD) websites, such as Reading Rockets: Launching Young Readers (http://www.readingrockets.org), provide

teachers and teacher educators with relevant theoretical and practical information (Beach, 2017; Masterman & Manton, 2011). Teachers who access PD websites usually have specific goals in mind, connect web-based content to current classroom issues, and use these online learning spaces for their planning and instruction (Beach, 2017).

In a study that examined teachers' exploration of a PD literacy website, teachers' navigations included searching and retrieving personally meaningful and relevant information (Beach & Willows, 2014). The preservice teachers constructed knowledge about teaching literacy as they navigated the website. In another study that examined effective forms of support for teachers' successful use of a PD website, Upitis et al. (2017) found that a website's focus on content and pedagogical knowledge contributed to the success of teachers' PD in online spaces. They also found that the continued and effective use of a PD website involved ongoing support from within and outside of the online environment.

Blogs

Blogs are an additional type of online resource that can create self-directed learning opportunities for teachers. As sharing and learning spaces, blog environments promote interactions between teachers — blog readers can interact with blog writers by posting replies, questions, and hyperlinks to additional information (Heo & Lee, 2013; Hou et al., 2009). Hall (2018) examined how blogging worked to support literacy teachers' professional development. Findings highlight the importance of support for teachers to reflect effectively upon their shifting views of literacy learning and instruction.

In another study that explored blog users' activities and informal processes, blog environments were found to engage users along a spectrum of interaction and participation (Heo & Lee, 2013). Varying levels of engagement allowed blog writers to share information based on their experiences, opinions, and knowledge. Blog readers constructed knowledge, reflected on ideas, and extended concepts to consider new information.

In any online environment, the usability can have a direct effect on individuals' willingness to continue their website navigation. Nielsen (2012) suggested five quality components of usability, including learnability, efficiency, memorability, errors, and satisfaction. These components are most often evaluated through inquiry (users' opinions), inspection (expert review), and usability testing (task-oriented; Battleson et al., 2001).

In recent years, usability research has expanded beyond the fields of marketing and website design to include education. Educational researchers are interested in feedback directly from the learner. Research examining the usability of online library systems (e.g., Battleson et al., 2001), university websites and online registrar offices (e.g., Tüzün et al., 2013), and blended learning environments (e.g., Alvarado-Alcantar et al., 2018), to name a few, have considered the users' satisfaction of and overall interest in the site. Regardless of the website, users will more often remain

on and return to a website when the five quality components are scored high (Nielsen, 2012).

Usability and design strongly influence a user's ability to interact with another user or group of users (Hur & Brush, 2009). In online environments, social engagement and interaction deepens with higher scores of usability. For instance, Hur and Brush found that teachers who participated in an accessible and user-friendly online professional learning community felt safe to share their emotions related to teaching, seek out answers to classroom issues, become less isolated, and explore new ideas. The teachers had an accessible space to share common interests, questions, and challenges related to their teaching practice. An online platform that is developed with the users' interests in mind allows those users to deepen their sense of camaraderie and professional learning.

In the current study, Song and Lee's (2014) criteria were used to evaluate the online resources used by this study's participants. As discussed in the methods section, Song and Lee's criteria were used to assess informal online environments and considered Nielsen's five components of usability; thus, the criteria were deemed appropriate to use for the current study.

Literacy Education

The current study occurred in the context of literacy education. For the purposes of this study, the approach to literacy education incorporated two interrelated notions: (a) language and print-related skills and (b) critical literacy. Each of these notions are discussed in detail.

First, a range of reviews have revealed a strong scientific consensus about the importance of including a specific set of skills related to language comprehension (e.g., phonological awareness and vocabulary) and print (e.g., alphabet knowledge) in all beginning literacy programs (August & Shanahan, 2006; Castles et al., 2018; Graham et al., 2012; Hjetland et al., 2017; National Reading Panel [NRP], 2000). The findings from these reports have been central to several major literacy documents across the United States and Canada (e.g., *The Common Core State Standards*, Common Core State Standards Initiative, 2020; *The Report of the Expert Panel on Early Reading in Ontario*, Early Reading Strategy, 2003).

One of the most influential reports on literacy curricula across North America has been the report of the NRP (2000). It was prepared by a panel of "leading scientists in reading research" and included a review of the scientific research literature on reading and its implications for reading instruction (p. 1). While this report was published nearly 2 decades ago, studies continue to echo the NRP's findings (e.g., Castles et al., 2018; Hjetland et al., 2017; Oakhill & Cain, 2012). What remains consistent is that beginning literacy programs should include explicit and systematic instruction in phonemic awareness, phonics, fluency, vocabulary, and reading comprehension.

These foundational literacy skills are essential to growth in literacy; however, they are not sufficient alone to foster critical ways of being and doing (Vasquez et al., 2019). Critical literacy should also be included in all literacy programs, across all grades (Harwood, 2008). Rooted in Paulo Freire's (1972) philosophies of critical and social justice pedagogy, critical literacy can be defined as the "use of the technologies of print and other media of communication to analyze, critique, and transform the norms, rule systems, and practices governing the social fields of everyday life" (Luke, 2012, p. 5). Critical literacy goes beyond the skills of reading and writing and emphasizes "meaning-construction" with a focus on literacy for social justice.

Examining the role that language plays in students' lives can help "shape students as critical thinkers and activists" (Sawch, 2011, p. 85). Teachers who foster a critical literacy environment help prepare their students for navigating a media-saturated world (Luke, 2012). In their recent article, Vasquez et al. (2019) discussed several studies over the past few decades that have examined the role of critical literacy across grade levels and subject areas. A key aspect they highlighted is that critical literacy practices can be transformative, even at a young age: "Students who engage in critical literacy from a young age are prepared to make informed decisions, engage in the practice of a democratic society, and develop an ability to think and act ethically" (p. 307). While teaching the basics of reading and writing is essential to raising the literacy levels across North America, teaching students how to become critical consumers by using strategies that encourage active engagement in thought-provoking media from diverse perspectives is necessary.

As Vasquez et al. (2019) discussed, critical literacy involves power relations and social justice. Taking a critical approach to literacy means "reading text critically to see how they have been constructed, whose interests are served, and how they work to produce our identities" (Janks, 2014, p. 355). Critically literate environments should provide students with many varied opportunities to ask questions, deconstruct stereotypes, co-construct knowledge, and examine multiple perspectives (Comber, 2001). Comber highlighted the importance of exposing students to critical literacy so that they can develop inherent understandings that "texts are constructed with particular motivations by particular goals and that these are never neutral" (p. 172).

Research has shown a positive relationship between teachers' knowledge of how to implement effective literacy education and student outcomes (Cash et al., 2015; Cunningham et al., 2009; Moats & Foorman, 2003; Piasta et al., 2012). For instance, a longitudinal study that examined the impact of teachers' knowledge of reading instruction on students' literacy achievements, found that teachers who received training on how to use explicit print references during reading had students with higher word reading and comprehension outcomes than children in a control condition (Piasta et al., 2012).

Studies that have examined instructional approaches in writing also suggest that elementary teachers who understand how to best implement high-quality research-based writing instruction have students who are writing more often during the school day and writing for specific purposes

(Doubet & Southall, 2018; Harward et al., 2014). Similarly, studies that have examined the role of critical literacy practices on student learning have shown positive effects (e.g., Cleovoulou & Beach, 2019; Behrman, 2006; Silvers et al., 2010). When teachers have the knowledge and material to teach literacy through a critical lens, students become active learners: students raise questions about language used in reading material to engage with text critically (James & McVay, 2009); they develop a sense of agency (Fecho et al., 2000) and become aware of who they are in relation to others (Cleovoulou & Beach, 2019).

Freebody and Luke's (1990) Four Resources Model was developed to support teachers' thinking about literacy. In their model, Luke and Freebody highlighted an interrelated repertoire of literacy practices that allow students to engage in literacy activities at a deep level. According to their model, becoming a literate individual requires four roles of the reader: text decoder, text participant, text user, and text analyst. All four components arguably require a fusion of skills related to language, print, and critical literacy.

In many ways, elementary teachers are recognized as being responsible for delivering instruction that incorporates these four components as well as instruction that "inspires and enables" students to become strong and independent readers and writers (Early Reading Strategy, 2003, p. 11). Given this incredible responsibility, elementary teachers require accurate and research-based information to effectively deliver high-quality literacy programs that incorporate language, print, and critical literacy skills. The challenge is determining how researchers and teacher educators can mobilize this research to elementary teachers through effective sources of information.

Literacy-oriented online resources are continuously being developed by government agencies and other educational stakeholders. For instance, the Ministry of Education in Ontario, Canada has launched several free online resources and documents for elementary teachers that target effective literacy instruction (e.g., http://www.eworkshop.on.ca, http://www.edugains.ca). These online resources provide teachers with many self-directed learning opportunities and guides that can support them in delivering a literacy program that considers the four roles outlined by Freebody and Luke (1990).

For instance, the freely available ministry document titled, *Critical Literacy: A Lens for Learning*, provides a combination of theoretical information as well as the practical aspects of teaching literacy through a critical lens (http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/Critical_Literacy.pdf). This article is one of several resources and videos that the province includes on its professional development website.

The fact that a growing number of research-based and literacy-oriented online resources exist is encouraging, but research identifying online resources that preservice teachers use is limited. Furthermore, no studies, to my awareness, have examined whether online resources used for literacy planning include effective and research-based instructional approaches. As such, the following research questions guided this study:

1. Which online resources do elementary preservice teachers use most often to assist them with their literacy planning and instruction?
2. Do preservice teachers use resources introduced to them in their coursework during their field experiences?
3. What is the quality of the identified online resources?
4. To what extent do the identified online resources effectively address language, print, and critical literacy skills?
5. Why do elementary preservice teachers use particular online resources to assist them with their literacy planning and instruction?

Methods

This study used a multimethod research design to examine online resources used by preservice teachers for their literacy planning and instruction. Specifically, descriptive statistics were used to answer Research Questions 1 to 4, while an inductive approach to qualitative methods was used to answer Research Question 5.

Study Context

This study was conducted in the context of a four-term initial teacher education program in Ontario, Canada. Upon completion of the program, graduates receive a Bachelor of Education degree and teaching certificate that qualifies them to teach prekindergarten to sixth grade. During the program, preservice teacher candidates complete two literacy curriculum courses for a total of 54 hours. The students also complete seven additional curriculum courses and 21 weeks of field experience.

Preservice teachers enrolled in the literacy course meet for 2 hours a week for 18 weeks. The 18-week course runs over two academic terms, with a 6-week field placement occurring after Weeks 6 and 15. The preservice teachers who participated in this study completed the survey either midway through or at the end of the first literacy curriculum course. The reason for the two time points of data collection was due to a low response rate during the first time point.

The literacy course is designed to introduce preservice teachers to instructional practices in the language arts and examines instructional principles for teaching literacy at the elementary level. Topics covered in the course include effective practices in language and print-related skills and critical and media literacy, as well as issues of assessment, storytelling, and children's literature (see Appendix A for a complete list of course topics). Course topics directly align with the provincial curriculum (which is divided into four sections: reading, writing, oral language, and media literacy).

Given that the course is mandatory for all primary/junior preservice teachers, multiple sections are available, and approximately 40 students are enrolled in each section. During this study's data collection period, six sections were taught by three different instructors. Although data regarding the perceptions of the course instructors were not collected for

this study, the course instructors met regularly to discuss teaching material and activities. These regular meetings resulted in consistency across weekly topics, teaching material, assignments, and suggested resources.

Throughout the course, preservice teachers were introduced to a range of literacy-oriented resources, both online and in print (see Appendix B for a list of recommended resources included in the course syllabus). Resources are most often introduced to the preservice teachers in three ways: a list of suggested resources directly related to the course topic is provided at the end of a given class, a specific resource sets a basis for an in-depth class activity or discussion, and resources (usually articles or book chapters) are recommended for reading prior to each class. Instructors encourage the preservice teachers to refer to the resources during their field placements and when completing course assignments.

Sampling and Recruitment

Purposive sampling was employed to recruit preservice teachers. This sampling technique was deemed appropriate because I was targeting a specific cohort of preservice teachers enrolled in a primary-junior literacy curriculum course. Three modes of recruitment were used: an email invitation sent out by a program administrator, a biweekly newsletter sent out to all students enrolled in the Bachelor of Education program, and course visits. The invitation to participate included a link to the study information letter and consent form. Those who agreed to participate in the survey were redirected to an anonymous online survey platform where they completed the survey.

Participants

The preservice teachers ($N = 77$) who volunteered to participate in this study all completed an informed consent form. All of the participants indicated using the Internet for their teaching practice. The majority of participants (92%) indicated that they felt confident using the Internet to access literacy-related content. Additionally, the majority of participants (91%, 93.6%) reported that they felt confident searching for information on the Internet using literacy-related keywords and using websites that support literacy education. Table 1 presents participant demographic information.

Table 1
Participant Demographic Characteristics

Characteristic	Frequency (N = 77) n (%)
Time in Course	
Mid-way through course	25(32.5%)
End of course	52(67.5%)
Age Range	
20-22 years	25(32.5%)
23-25 years	45(58.4%)
26-29 years	5(6.5%)
30+ years	2(2.6%)
Use of the Internet for Teaching Practice	
Yes	77(100%)
No	0
Confidence Using the Internet to Access Literacy-Related Content	
Strongly agree	39(50.6%)
Agree	32(41.6%)
Neutral	4(5.2%)
Disagree	2(2.6%)
Strongly disagree	0
Confidence Searching for Information on the Internet by Using Literacy-Related Keywords	
Strongly agree	33(42.9%)
Agree	37(48.1%)
Neutral	7(9.1%)
Disagree	0
Strongly disagree	0
Confidence Using Websites that Support Literacy Education	

Characteristic	Frequency (*N* = 77) *n (%)*
Strongly agree	36(46.8%)
Agree	36(46.8%)
Neutral	4(5.2%)
Disagree	1(1.3%)
Strongly disagree	0

Data Sources

Online Survey

The anonymous online survey used for this study was part of a larger research project examining preservice teachers' self-directed online learning competency and their self-efficacy for teaching reading and writing. The survey was hosted on the survey platform, Qualtrics (www.qualtrics.com). For the purposes of this study, two items from the survey were analyzed: (a) List three websites you use most often to assist you with your literacy planning and instruction, and (b) Describe the reasons why you like these websites. Responses from the first survey item contributed to answering the first four research questions. The second survey item was used to gain insights into the reasons participants selected particular online resources and contributed to answering the fifth research question.

Evaluation Criteria

To evaluate the online resources identified by the preservice teachers, eight criteria from Song and Lee's (2014) work evaluating informal online learning environments were used. The eight evaluation criteria were adapted to the context of literacy education and included the following:

1. Content richness: accuracy of literacy content and credibility of information;
2. Functionality of the technology: ease of access and navigation;
3. Range of technologies: wide range of technologies, interactive, and collaborative tools;
4. New technologies: utilization of new and/or emerging technology;
5. Authenticity of the learning environment: opportunities to explore real-world issues;
6. Potential for learning: tools for tracking learning and self-testing;
7. Potential for change: change in literacy beliefs and practices; and
8. Audience impact: potential to impact in-service teachers, preservice teachers, literacy teacher educators, and literacy coaches and administrators.

Table 2 presents the criteria.

Table 2
Online Resource Evaluation Criteria

Content Richness
• Is the content adequate for learning purposes?
• Does the content stem from a credible source (e.g., university)?
• Does the content address language and print-related skills?
• Does the content address critical literacy skills?
• Does the content include clear guidance to support a four resources framework to literacy education?
Functionality of the Technology
Is the resource easy to access and navigate?
Does the resource's underlying architecture contribute to the ease of use?
Range of Technologies
Does the resource provide a wide range of technologies, including interactive and/or collaborative tools (e.g., online message boards)?
New Technologies
Does the resource utilize new and/or emerging technology (e.g., virtual environments)?
Authenticity of the Learning Environment
Does the resource provide opportunities to explore real-world issues through authentic learning experiences (e.g., demonstration videos)?
Potential for Learning
Does the resource include tools for tracking learning and self-testing (e.g., test your knowledge)?
Audience Impact
Does the resource have the potential to impact practicing teachers, preservice teachers, literacy teacher educators, literacy coaches, and school administrators?

Data Analysis

To answer Research Question 1 (Which online resources do elementary preservice teachers use most often to assist them with their literacy planning and instruction?), the online resources identified by participants were tallied. This resulted in 30 different websites (see Table 3). To answer Research Question 2 (Do preservice teachers use resources introduced to them in their coursework during their field experiences?), the 30 websites identified by the preservice teachers were compared with the resources listed on the course syllabus.

Table 3
Identified Online Resources (from highest frequency to lowest)

Title and Hyperlink	Brief Description	Frequency $N = 77$ $n(\%)$	Type of Online Environment
Pinterest www.pinterest.com	A content sharing network that allows users to share information through a variety of media tools, including photographs, videos and web links.	51(65.4) [a]	Content-sharing network
The Balanced Literacy Diet: Putting Research into Practice in the Classroom www.LitDiet.org	A free multimedia professional development website for literacy teachers and educators.	42(53.8)	Professional learning resource
Google www.google.com	A search engine for searching information using keywords.	27(34.6)	Web portal
Teachers Pay Teachers www.teacherspayteachers.com	An open-access platform where teachers share lesson plans and course material at a cost or for free.	23(29.5)	Informational
Reading Rockets: Launching Young Readers www.readingrockets.org	A free multimedia literacy website offering information about reading development and instruction.	11(14.1)	Professional learning resource
Ontario Ministry of Education www.edu.gov.on.ca	Provincial website that provides curriculum resources including literacy expectations.	9(11.5)	Curriculum resource
YouTube www.youtube.com	A free online video sharing resource.	7(9.0)	Video resource
EduGains www.edugains.ca	A provincial website for teachers that provides a variety of learning tools	5(6.4)	Curriculum resource

Title and Hyperlink	Brief Description	Frequency $N = 77$ $n(\%)$	Type of Online Environment
	(e.g., learning modules, video tutorials) on a range of subjects.		
Teacher blogs	Provide educational information, both pedagogical and content-based, for educators through regular journal entries.	5(6.4)	Blog
Internal course website (link removed for peer review)	Literacy course website that contains course-related readings, materials, and assignments.	5(6.4)	Informational
University Library (link removed for peer review)	Access to a range of scholarly articles and teaching resources.	4(5.1)	Informational
Reading A-Z http://www.readinga-z.com	A literacy website that provides teachers with downloadable leveled readers, lesson plans, and worksheets.	3(3.8)	Informational
The Daily CAFE www.thedailycafe.com	A professional development website for literacy teachers and teacher educators about a specific literacy approach.	3(3.8)	Informational
Education.com www.education.com	A literacy and mathematics website for teachers that provides guided lessons, games, and downloadable worksheets.	2(2.6)	Informational
Read Write Think www.readwritethink.org	Provides teachers and students with interactive tools and lesson plans.	2(2.6)	Professional learning resource
Media Smarts www.mediasmarts.ca	A Canadian based website that provides users with information and resources on media literacy education.	2(2.6)	Informational
Facebook www.facebook.com	A social networking site that provides opportunities for users to share content within a community platform.	1(1.3)	Social networking site
NoveList	A collection of K-8 books.	1(1.3)	Digital books

Title and Hyperlink	Brief Description	Frequency *N* = 77 *n*(%)	Type of Online Environment
holastic www.scholastic.ca	A publishing organization that provides children's books and educational materials.	1(1.3)	Informational
Kahoot http://kahoot.it	A game-based platform for student learning.	1(1.3)	Student interactive
Storyline Online www.storylineonline.net	A series of videos showcasing children's books read by celebraties.	1(1.3)	Digital books
Super Teacher Worksheets http://superteacherworksheets.com	A collection of printable worksheets.	1(1.3)	Informational
K-5 Learning http://k5learning.com	A collection of lessons and worksheets for parents and educators.	1(1.3)	Informational
Ophea: Healthy Schools, Healthy Communities http://ophea.net	A collection of Health and Physical Education lesson plans and activities.	1(1.3)	Curriculum resource
Epic! http://getepic.com	A collection of children's books in digital form.	1(1.3)	Digital books
Think Literacy edu.gov.on.ca/eng/studentsuccess/thinkliteracy/	A series of lesson plans, posters, and activities related to literacy education.	1(1.3)	Informational
Raz Kids raz-kids.com	A collection of leveled reading resources for students.	1(1.3)	Student interactive
Nelson Literacy http://nelsonliteracy.com	Teacher guides and resources for teaching literacy across the grades.	1(1.3)	Informational
Starfall http://starfall.com	A website that teaches foundational literacy skills to beginning readers.	1(1.3)	Student interactive

[a] Example: 51 participants (65.4%) listed Pinterest as one of the websites they use to assist them with their literacy instruction

Research Questions 3 (What is the quality of the identified online resources?) and 4 (To what extent do the identified online resources effectively address language, print, and critical literacy skills?) were

answered using the evaluation criteria (see Table 2). Specifically, the 10 online resources reported by five or more participants were rated based on eight criteria using a 5-point Likert scale (1 is low; 5 is high; Song & Lee, 2014). Two researchers with a background in literacy education used the following guidelines to evaluate each online resource:

1. View the homepage and about us page, if available, as well as any additional webpages included on the homepage;
2. Use the following search terms if a keyword search or filter option is available: search terms related to language-related skills (including phonological awareness, phonemic awareness, vocabulary, comprehension), search terms related to print-related skills (including phonics and fluency), and search terms related to critical literacy (including critical literacy, critical awareness, critical thinking);
3. Rate each online resource according to the criteria using a 5-point Likert scale (1 is low; 5 is high).

Finally, an inductive approach to qualitative analysis (Creswell & Plano Clark, 2007) was used to answer research Question 5 (Why do elementary preservice teachers use particular online resources to assist them with their literacy planning and instruction?). Specifically, open responses from the second survey item (Describe the reasons why you like these websites) were first uploaded to NVivo (2012), a qualitative software program used to assist with qualitative analysis.

The responses were then read reflectively to gain a general sense of participants' perceptions and opinions of the identified resources. Phrases, which ranged from two words to several sentences, and single words were then reviewed and coded through an open coding technique. For instance, the phrase, "The visuals help you realize what [teachers] used and how you could adapt the lesson idea using the tools available to you in your classroom/ school" was coded as Visual Aesthetics. The single word "accessible" was given the NVivo code Accessible.

Overall, 120 phrases and words were coded. These phrases and words were referred to as thought units, where each unit of thought includes a single meaningful idea related to the reasons the participants liked the identified online resources. The thought units were organized into categories that resulted in a list of five major themes related to the reasons preservice teachers use particular online resources for literacy instruction: Accessibility and Convenience, Content Variety, Visual Aesthetics, Literacy Content, and Source Credibility.

Results

The aim of this study was threefold: to identify online resources used by elementary preservice teachers for literacy planning and instruction; to evaluate the quality of the identified online resources; and to identify the reasons why elementary preservice teachers use particular online resources for literacy planning and instruction. Results are organized according to the research questions.

Research Question 1

The online resources identified by the participants are summarized in Table 3. The accompanying descriptions are based on information presented on each resource's homepage or About Us page. More general descriptions are based on the type of information the resource provides (e.g., blogs). The term "online resource" is used in lieu of the term "website" to encompass all types of online learning environments. Participants were able to include up to three online resources in their survey responses; however, several participants reported less than three online resources. As previously stated, participants identified 30 different online resources.

The online resources were then organized according to 15 types of online learning environments described in a study that examined the use of online resources by practicing elementary teachers (Beach, 2017). These are also included in Table 3. Of the 30 online resources reported, 13 were categorized as Informational Online Resources. These types of online resources, which provide take-away information and teaching material about literacy topics, were reported most often (e.g., Reading A-Z). In addition, three of the online resources were categorized as Professional Learning Resources, three as Curriculum Document Resources, three as Digital Books, and three as Student Interactive Sites.

Professional Learning Resources can include a variety of interactive learning tools, including modules, videos, and links for enhancing content and pedagogical knowledge (e.g., Readwritethink), whereas Curriculum Document Resources provide access to government resources outlining guidelines and curriculum expectations (EduGains), and Digital Books provide a range of stories in digital form (Storyline Online).

Student interactive sites, such as Starfall, provide online games, activities, videos, and other interactive tools for students. Pinterest, which was the online resource identified most often by participants (51, 65.4%), was categorized as a Content-Sharing Network, in which users share content through a variety of social media tools, including photographs, videos, and web links. Other types of online resources include Web Portals (e.g., Google), Video Resources (e.g., YouTube), Blogs, and Social Networking Sites (e.g., Facebook).

Research Question 2

Five of the resources identified by the preservice teachers in this study were introduced during their literacy coursework. The curriculum website identified by the participants (http://www.edu.gov.on.ca) is a Ministry of Education homepage that provides access to three of the four resources listed on the course syllabus. Four additional resources were also included on the course syllabus under the heading: highly recommended texts and resources recommended for the classroom. They include

www.LitDiet.org
www.readingrockets.org

www.edugains.ca
http://readwritethink.org

While these five resources only account for 17% of the total number of online resources identified by the preservice teachers in this study, four of the five are included in the top 10 online resources and, overall, LitDiet.org was identified by 42 (53.8%) preservice teachers in the study. These findings are promising and suggest that resources introduced to preservice teachers during their initial teacher training are used to assist them with their literacy planning and instruction, at least some of the time. However, the majority of the resources identified by participants (25, or 83%) were not included on the course syllabus. The remaining research questions, therefore, provide further insight into the quality and credibility of the online resources used by the preservice teachers in this study. These findings are further examined in the discussion section.

Research Question 3

The mean scores of the online resources identified most often are presented in Table 4. Eight online resources were included in the evaluation because they were identified by five or more participants and included specific hyperlinks. While content richness was particularly difficult to evaluate for the resources Pinterest and Google, the raters used keywords within each search engine to further explore content from these sites. Hyperlinks that resulted on the first two to three pages of the search query were evaluated for content richness.

Table 4
Mean Scores of the Top Eight Online Resources

Category	Online Resource [a]							
	1	2	3	4	5	6	7	8
Content Richness								
Is the content adequate for learning purposes?	5	5	3	3	5	4.5	3	4
Does the content stem from a credible source (e.g., university)?	1	5	2	1	5	5	1	5
Does the content address language and print-related skills?	3	5	3	1	5	5	3	5

Does the content address critical literacy skills?	3	2	4	1	4	5	3	5
Does the content include clear guidance to support a four resources framework to literacy education?	3	5	3	2	5	3	3	3
Does the content include accurate literacy-related language (including critical thinking) and representations?	4	5	3	3	5	5	3	3
Mean Score (Content Richness)	3.2	4.5	3	1.8	4.8	4.8	2.6	4.2
Functionality of the Technology								
Is the resource easy to access and navigate?	5	4	4	3	4	3	4	3
Does the resource's underlying architecture contribute to the ease of use?	5	3.5	3.5	3	4	3	4	3
Mean Score (Functionality of the Technology)	5	3.75	3.75	3	4	3	4	3
Range of Technologies								
Does the resource provide a wide range of technologies, including interactive and collaborative tools?	3	4	3	2	3.5	1	3	3
New Technologies								

Does the resource utilize new and interactive technologies (e.g., virtual tour technology)?	2	5	2	1	3	1	4	1
Authenticity of the Learning Environment								
Does the resource provide opportunities to explore real-world issues through authentic learning experiences?	5	5	2	2	5	3	5	4.5
Potential for Learning								
Does the resource include tools for tracking learning and self-testing (e.g., test your knowledge)?	3	2	2	1	5	1	2	2
Potential for Change								
Does the resource have the potential for teachers to change their beliefs and practices (e.g., videos include real teachers)?	3	5	2	2	5	2.5	5	3.5
Audience Impact								
Does the resource have the potential to impact practicing teachers?	5	5	3	2.5	5	5	5	4
Does the resource have the potential to	5	5	3	1.5	5	5	5	4

impact preservice teachers?								
Does the resource have the potential to impact literacy teacher educators?	4.5	5	3	2	5	5	5	4
Does the resource have the potential to impact literacy coaches and school administrators?	4.5	5	3	1	5	5	5	4
Mean Score (Audience Impact)	4.75	5	3	1.75	5	5	5	4
Overall Mean Score	3.62	4.34	2.57	1.84	4.44	2.63	3.83	3.13

[a] Online Resource: 1 = www.pinterest.com; 2 = www.LitDiet.org; 3 = www.google.com; 4 = www.teacherspayteachers.com; 5 = www.readingrockets.org; 6 = www.edu.gov.on.ca; 7 = www.youtube.com; 8 = www.edugains.ca

The online resources that scored the highest, on average, for content richness were LitDiet ($M = 4.5$), Reading Rockets ($M = 4.8$), and Ontario's Ministry of Education website, EduGov ($M = 4.8$). The online resource that scored the lowest for content richness was Teachers Pay Teachers ($M = 1.8$). For functionality of the technology, Pinterest had the highest average score of 5. LitDiet scored the highest for range of technologies ($M = 4.0$) and new technologies ($M = 5.0$). For authenticity of the learning environment, Pinterest, LitDiet, and Reading Rockets scored the highest ($M = 5.0$ for all three). Reading Rockets had the highest score for potential for learning ($M = 5.0$). Along with Reading Rockets, LitDiet scored the highest for potential for change ($M = 5.0$ for both).

Finally, five of the eight resources were given high scores, on average, for audience impact (Pinterest, $M = 4.75$; LitDiet, $M = 5.0$; Reading Rockets, $M = 5.0$; Edu.Gov, $M = 5.0$; YouTube, $M = 5.0$). The online resources with the highest overall scores were LitDiet ($M = 4.34$) and Reading Rockets ($M = 4.44$). YouTube and Pinterest scored relatively high overall (with scores of $M = 3.83$ and $M = 3.62$, respectively), while Teachers Pay Teachers had the lowest overall score ($M = 1.84$).

Research Question 4

The results of the evaluation indicate that four of the top eight identified online resources were rated 4 or higher for content richness (LitDiet, Reading Rockets, Edu.gov, and Edugains). LitDiet is a professional development website that covers a broad range of literacy skills. Using a metaphor for a healthy eating diet, LitDiet's "recipes," or lesson plans, relate to one or more of the "food groups" necessary for growth in literacy at specific stages of literacy development.

Reading Rockets is produced by PBS and the National Institutes of Health and offers resources to teachers, parents, and educators designed to help young children, especially struggling readers, build their fluency, vocabulary, and comprehension skills. Edu.gov provides a plethora of curriculum resources for Ontario teachers and educators. For example, within the "professional development resources" section, available multimedia resources address a range of literacy topics across grades and subject areas. Finally, EduGains, also developed by the provincial government, houses research-based resources to support literacy programs across kindergarten through Grade 12.

The findings related to Research Question 4 suggest that the preservice teachers in this study used online resources that contain information about language, print, and critical literacy related skills. These resources align with Freebody and Luke's (1990) Four Resources Model and address the four roles of the reader (text decoder, text participant, text user, and text analyst).

Along with a high overall rating in content richness, these top four resources were also rated high for authenticity of the learning environment. This finding is consistent with Lee et al. (2012) and suggests that preservice teachers are interested in learning about what works; they want to find valid practices that have been tried and authenticated. These resources are not only authentic, but they provide research-based information about how to best teach literacy in schools. LitDiet did not score high for explicitly addressing critical literacy, however. The terms "critical thinking" and "critical awareness" were most often related to knowledge building and deeper levels of comprehension; however, no webpages on this site were solely dedicated to critical literacy.

Research Question 5

The findings related to Research Question 5, which are summarized next, corroborate the results of the evaluation. Specifically, five major themes provide insight into why the preservice teachers selected and used particular online resources for their literacy planning and instruction. These themes coincide with three of Nielsen's (2012) usability components: learnability, efficiency, and satisfaction.

Accessibility and Convenience

Thirty-nine percent of participants agreed that the online resources they used most often are accessible, user friendly, and convenient. For

example, one participant described the online resource they used most often as "very well laid out and easy to access." Additionally, Pinterest, the resource identified most often by participants, was described as "easy to navigate," "easy to search and scroll through," and "convenient and free." One participant said that Google and YouTube "allow me to search for resources quickly."

Content Variety

Almost half of the participants (45%) described the variety of accessible information and activities as a reason for returning to particular resources for their literacy planning and instruction. For example, one participant stated that the resources "provide many options and ideas on which to base my teaching techniques and lesson plans." Similarly, participants reported that the identified online resources "provide huge amounts of information presented in many different ways," "a wealth of practical ideas," and "a wide breadth of activities and ideas from which to choose."

The website, Reading A-Z was said to provide "access to a wide range of texts, including interesting books for lower grade levels." Similarly, a participant stated that the online resources they use most often provide "a range of materials to be available for a variety of grade levels and abilities."

Visual Aesthetics

While only a few participants (10%) discussed the visual aesthetics of the online resources, this factor can be linked to Pinterest, which was the top online resource participants identified. For example, one participant stated that Pinterest offers "visual displays … the visuals help you realize what [the teacher] used and how you could adapt the lesson idea using tools available to you in your school." Pinterest was noted as "visual with minimal reading [and] hundreds of options to easily view at once." One participant also made reference to the benefits of the virtual classrooms from LitDiet: "I really appreciate the virtual tours that give us a visual example of activities we can implement in our classroom."

Literacy Content

Thirty percent of participants appreciated the content that related specifically to literacy. In particular, the identified online resources were noted as providing "instructional activities based on the specific literacy skill," "creative ideas to use in literacy," and a "breakdown of all the different components in reading, writing, and oral expression." In addition, participants noted that the online resources highlight real-world issues: "They combine experiences from teachers who have actually used the lessons"; and "lessons have actually been tried by teachers with their students."

LitDiet was also noted as an online resource that includes "more than just lesson plans … there are suggestions for how to incorporate literacy into all parts of the classroom." Additionally, "The Ministry of Education site has the curriculum and the Capacity Building series that help me to find ideas about how to approach literacy instruction."

Source Credibility

A small but important finding was the group of participants (23%) who stated that they were motivated to use an online resource they could trust. One participant appreciated the "rigor in the website's research and findings," while another participant stated that the online resources they used "come from a reliable source that I trust will provide me with quality resources." Specifically, LitDiet was included on this participant's list because "it provides tons of research-based content and explains the research behind the activities."

Discussion and Implications

This study sought to examine and evaluate online resources used by elementary preservice teachers to assist them with their literacy planning and instruction and to identify reasons why preservice teachers used particular online resources. Understanding the types of online resources preservice teachers use most often has implications for teacher educators, literacy researchers, and educational institutions who can consider this information when planning literacy coursework, mobilizing research-based instructional practices, and developing and refining online learning platforms. Student academic performance largely depends on the instruction they receive. When teachers have access to information about how to best teach literacy in school, students are more successful in achieving their potential (Moats & Foorman, 2003; Piasta et al., 2012).

Overall, results show that the elementary preservice teachers from this study used a range of literacy-oriented technologies and online platforms for various reasons. From more rapid, immediate exchanges of information and sharing between teachers (Pinterest) to more in-depth and reflective processing of information (Reading Rockets), the identified online resources provide opportunities to interact and discuss with others, learn from others, and consult information sources (as also found in Kyndt et al., 2016).

Given that over half of the participants in this study identified Pinterest as an online resource used most often to assist them with literacy instruction, this content-sharing network merits more attention in the research literature. Twitter and Facebook, as well as blog environments, have acquired an interest by researchers over the past few years (Carpenter & Krutka, 2015; Colwell & Hutchison, 2018; Hall, 2018), yet Pinterest has received less attention in the context of literacy education, specifically, and teacher learning more broadly (Shapiro et al., 2019). While participants in this study provided reasons why they used Pinterest — visual aesthetics, content variety, accessibility, and convenience — future research should track the behavioral patterns and decision-making strategies of teachers as they navigate Pinterest for their professional practice in literacy.

The choices that the preservice teachers made in terms of their preferred sites are, for the most part, consistent with Shapiro et al.'s study (2019) and suggest that the presentation of information, the visual appeal, and user-friendliness had a strong impact on the participants' reasons for selecting and returning to particular websites. In fact, research has

suggested that Internet users, in general, return to websites that include an appealing visual presentation (Michailidou et al., 2008).

Website characteristics, such as layout and organization, pictures, and diversity of information, are key to whether a user will decide to stay on a website (Nielsen, 2012). One possible reason is that visuals and pictures often evoke an emotional response from the user. When an experience impacts individuals on an affective level, a stronger connection is made between the presented material and a user's knowledge (Levitin, 2006).

Generating moment-to-moment data can provide information about the learning processes involved when teachers select and share literacy material in popular online communities, including Pinterest. Teacher educators and educational institutions should capitalize on the popularity of Pinterest by posting and sharing research-based instructional practices to the site in order to mobilize literacy research to teachers. Additionally, literacy teacher educators could incorporate Pinterest into their course assignments, leveraging preservice teachers' motivation to use of this content-sharing platform.

For instance, if a course assignment asks preservice teachers to gather and discuss high-quality resources in a literacy portfolio, Pinterest could be an optional space on which students showcase their work. These suggestions, however, should be considered with caution: Platforms like Pinterest and Twitter have their own financial motives. Advertisement pop-ups and marketing strategies drive these large social media networks; thus, teacher educators and educational stakeholders, including knowledge mobilizers, should consider the financial motivations of these platforms if deciding to use these social media networks to share educational resources.

Given the findings of this study and the evident biases of commercial websites that are structured more for profit than for the benefit of educators, a call for a continued discussion of the relationship between certain online resources and their commercial versus noncommercial content is needed. This issue is particularly important to consider with respect to sites like Pinterest and Teachers Pay Teachers, since the content in these types of platforms is not monitored by a credited evaluator. Anyone who signs up with these platforms, whether associated with a credible organization or not, can upload and share content with the public. For-profit organizations do not always have the consumers' interests in mind. For-profit websites are often tracking and selling user inquiries; thus, educators should be aware and critical of the implications of these tools they are using.

One might argue (as one of the reviewers of this article pointed out) that content shared by for-profit organizations might be perceived as more visually appealing and, therefore, selected more often than more text-heavy content. As such, teacher educators must discuss these types of marketing ploys when introducing online resources to their students.

Just like their students, teachers need to engage in critical literacy at a deep level when selecting resources to share with their students (Janks, 2014). Texts, whether online or in print, should always be read critically, especially by those, including educators, who are using such texts to

inform their professional learning. Online material, including material shared via social media, must be read through a critical lens; as Janks highlighted, the ways in which these texts have been constructed is influenced by the interests of the producers and can have an immediate effect on the readers' beliefs and values. All texts and media are never neutral, and this fact must be discussed with preservice teachers.

In evaluating the top eight online resources used by the preservice teachers in this study, findings reveal a mix of research-based professional resources, popular search engines, and content-sharing networks. While several of the online resources identified by the preservice teachers do include language, print, and critical literacy skills and align with the four roles of the reader, many do not adequately cover these key components of effective literacy education and related instructional approaches. This fact has strong implications for the kinds of pedagogies preservice teachers might enact with their students. When misinformation or surface level information is delivered through high-traffic and visually appealing online resources, such as Pinterest, users may be swayed by their affective responses and incorporate instructional strategies that do not align with what research has been shown to be effective.

Another consideration related to Pinterest and other social networks is the degree to which these types of online resources afford social interaction related to their appeal in usability (Hur & Brush, 2009). Pinterest scored the highest in terms of functionality of technology; Pinterest is easy to access and navigate, and the underlying architecture contributes to the ease of use. The ability to freely navigate and share content is indeed a reason why Pinterest is so popular. Yet, one must wonder whether Pinterest users merely view and download photos and other images that have been pinned to a relevant board rather than interact socially with each other.

If users do comment on each other's material, are the comments providing any critical evaluation of material or contributing to deep levels of discourse about teaching literacy? Do social networks that deliver on appeal also deliver on collaboration? While the field of usability research is vast, questions about usability in relation to teachers' interactions in informal online environments should continue to be considered in future studies. If a goal of online social networks is to promote interaction between educators, consideration must be given to user experience in relation to the depth of interactions between users.

Four of the top eight resources, for instance, scored relatively low on content richness (Pinterest, Google, Teachers Pay Teachers, and YouTube). Pinterest, for example, includes a range of secondary sources that vary in credibility and quality of information. Several sources that resulted from the Pinterest search, "phonemic awareness" and "critical literacy," for example, provided inaccurate information; in one instance phonics instruction was mislabeled as phonemic awareness (where phonemic awareness deals with the manipulation of the smallest sounds in words and phonics instruction associates letter-sounds with their corresponding symbol).

Similarly, the search "vocabulary instruction" resulted in several resources focused on phonics instruction. While phonics and encoding text relates to spelling and morphology, two important aspects of vocabulary instruction, vocabulary itself "refers to the words we must know to communicate effectively" and relates to both oral vocabulary and reading vocabulary (Armbruster et al., 2001, p. 29). Additionally, when terms associated with critical literacy were entered into the search engine in Pinterest, the top results merely focussed on a surface level of critical literacy. They provided a list of the types of questions to use to foster critical discussions, for instance, with no discussion of the deeper components of critical literacy, including the interrogation of multiple viewpoints, sociopolitical issues and power relationships, and reflecting and acting on change (Harwood, 2008).

In fact, other than EduGains, most of the top resources identified by the preservice teachers lacked depth in their approach to critical literacy. This finding has negative implications for the kinds of pedagogies that preservice teachers might enact with their students. As highlighted by Vasquez et al. (2019), critical literacy involves "looking at an issue in different ways, analyzing it, and suggesting possibilities for change and improvement" (p. 300). If preservice teachers are not aware of these foundational characteristics necessary for teaching through a lens of critical literacy, then their students will not be prepared to make informed decisions, engage with text and media in a critical way, and develop productive critical thinking skills.

While participants referred to Pinterest as a convenient tool with a variety of content, the question remains as to whether or not Pinterest users actually take the time to consider source credibility of resulting instructional activities. Based on the results, source credibility was acknowledged by only a small group of participants and they appeared to make the connection of source credibility to the professional online resources. Future research should examine the decision-making processes of both novice and experienced teachers as they navigate Pinterest for literacy learning and instruction.

As discussed earlier, not only do students need to critically consume texts and media. Teachers must also be responsible critical consumers and engage with online resources through a critical literacy lens. Luke and Freebody's Four Resources Model should not be limited to elementary and secondary students. Aspects of the model related to making meaning and using and analyzing text are indeed pertinent to any media consumer. Expecting elementary students to be critically literate means that teachers must model and practice critical literacy in their everyday lives. Teacher educators have the responsibility to ensure that new teachers view practical resources and online material through a critical lens.

An additional important finding relates to the content richness of the resources. Many participants highlighted literacy content as a reason for accessing particular online resources. This finding is consistent with studies that have found that teachers seek out answers to specific questions they have about content or pedagogical techniques (Donohoo & Velasco, 2016). However, ascertaining whether information accessed

online is making its way into the classroom and having an impact on teacher practice and student performance is difficult. This impact needs to be documented through observations and randomized controlled studies rather than through teacher reports alone.

While research has documented the impact of formal professional development opportunities (Ottley et al., 2015; Piasta et al., 2012), research has yet to examine the extent to which informal learning impacts literacy instruction and student growth in reading and writing. Future research could examine this issue through observations of preservice teachers during their field experiences. Additionally, future research could consider following up with novice teachers during their first 5 years of teaching to determine whether they continue to use resources introduced to them during their initial teacher education programs.

Study Limitations

The results of this study are limited by the context in which this study occurred. Some of the online resources used by the participants in this study were introduced to them during their coursework. Different institutions might introduce different online resources to preservice teachers and, therefore, the results of this study cannot be generalized. As a result, preservice teachers' perceptions of literacy content may vary according to their training. In this study, the training that the preservice teachers received aligned with the province of Ontario's Ministry of Education curriculum expectations. Reading, writing, oral language and media are the four main components of the curriculum, and based on the course topics and recommended readings, the resources and information that the preservice teachers would have been exposed to cover these areas. While this finding indicates potential benefits of introducing credible online resources to preservice teachers, this limitation highlights the need of more research in this area.

Additionally, the self-reported measure used in this study provides a limited amount of information about the online resources the participants indicated using to assist them with their literacy planning and instruction. Follow-up questions could ask respondents to include specific names of sites that result from their searches in Google and Pinterest. Moreover, documenting participants' navigations of their search behaviors while navigating Google and Pinterest through screen-capture recordings could provide essential information about preservice teachers' search behaviors. Future studies should examine how preservice teachers assess certain websites and the selection process preservice teachers go through when determining which material they use for their literacy planning.

The small sample size along with the two data collection time points also need to be taken into consideration when interpreting the findings. Future studies involving larger sample sizes across contexts will be helpful in corroborating the results. Additionally, the two data collection time points could have influenced the survey responses. While the resources outlined in the course syllabus were introduced to participants at the beginning of the course, continued coursework and field placements could have

influenced how the preservice teachers were seeking out and using online resources.

Finally, this study did not directly investigate participants' actual literacy planning and instruction. Following up with preservice teachers through observations is an important next step in examining the resources preservice teachers use to assist them with their literacy planning and instruction.

Conclusion

As the Internet continues to be a primary mode of information for preservice teachers, it is essential to examine *what* resources preservice teachers use, *how* they use these resources, and *why* they use these resources for literacy planning and instruction. Generating this data is important input for literacy teacher educators, associate teachers, and educational institutions who are often the first to disseminate information to preservice teachers about how to best teach literacy in schools.

The quality of literacy instruction children receive in elementary school, especially in early primary grades, is strongly related to academic success. If elementary teachers do not use high-quality research-based resources to plan and guide their practice, gaps in instruction might impact their students' growth in reading and writing. Teacher educators, associate teachers, and educational institutions can help fill this gap by sharing credible and research-based online resources with their preservice teachers and incorporating these resources into literacy education coursework and assignments. Rather than allocating time for literacy instruction in ways that are inconsistent with research-based recommendations, as Spear-Swerling et al. (2016) found, elementary teachers who have a solid base of resources to use for literacy instruction can implement effective literacy programs.

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Appendix A
List of Recommended Resources Included in Course
Syllabus

Allington, R. (2006). *What really matters for struggling readers: Designing research-based programs.* Toronto: Pearson.

The Balanced Literacy Diet: Putting Research into Practice in the Classroom. www.LitDiet.org

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EduGains. http://www.edugains.ca/newsite/HOME/index.html

Early Reading Strategy: The report of the expert panel on early reading in Ontario (2003). http://www.eworkshop.on.ca/edu/resources/guides/ExpPanel_K-3_Reading.pdf

Literacy for Learning: The Report of the Expert Panel on Literacy in Grades 4 to 6 in Ontario (2004). http://www.edu.gov.on.ca/eng/document/reports/literacy/panel/literacy.pdf

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McGregor, T. (2007). *Comprehension connections: Bridges to strategic reading.* Heinemann Publisher.

Miller, D. (2013). *Reading with Meaning: Teaching Comprehension in the Primary Grades.* Stenhouse Publishers.

The Ontario Curriculum, Grades 1-8, Language (2006). http://www.edu.gov.on.ca/eng/curriculum/elementary/language18currb.pdf

Put Reading First: The Research Building Blocks for Teaching Children to Read, September 2001. http://lincs.ed.gov/publications/pdf/PRFbooklet.pdf

Read, Write, Think. http://www.readwritethink.org/

Reading Rockets. http://www.readingrockets.org/

Appendix B
List of Course Topics

Assessment in Reading & Guided Reading
Assessment in Writing: Moderated Marking & Writing Portfolios
Children's Literature
Critical Literacy
Guided Writing & Approaches to Teaching Writing
Literature Circles: Fostering Choice & Independence
Media Literacy
Modeled & Shared Writing Across the Curriculum
Oral Language & Vocabulary
Oral Storytelling & Indigenous Languages
Phonemic Awareness & Phonics
Planning & Organizing a Literacy Program
Planning and Assessing for Struggling Readers and Writers
Reading Fluency & Comprehension Strategies: Modeled & Shared
Reading
Word Work & Morphology