http://dx.doi.org/10.20880/kler.2017.52.5.121

A Review of Effective Digital Practices for Improving Literacy Instruction

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I. Introduction

How should literacy teachers be educated to improve their instruction? It is a crucial question because teacher quality matters more than other factors such as the program, materials, and group size in terms of student reading achievement (Bean & Morewood, 2011). Anders, Hoffman, and Duffy (2000) called on reading researchers to turn their attention from the process and learning of reading itself to teachers' learning and their classroom practices, which was not literacy researchers' primary interest until the turn of the 21st century.

After their request, studies in literacy teacher education have widely been growing (Dillon, O'Brien, Sato, & Kelly, 2011; Risko et al., 2008; Snow, Griffin, & Burns, 2007). Such efforts were paid off by providing many useful insights and understandings about literacy teacher education. Particularly, some researchers came up with what is called *best practices* in teacher education and professional development, which may be an important source of expertise that could be helpful for enhancing literacy teachers' knowledge, skills, and dispositions (Bean & Morewood, 2011).

Meanwhile, although situations vary from country to country, there has been a rapid increase in online courses in higher education

(Allen, Seaman, Poulin, & Straut, 2016). At least in the United States, teacher education in general and the literacy field are part of this trend (Pang, 2016; Toppo & Schnaars, 2012). As more and more prospective and practicing teachers are going online, there is also a growing realization that many digital practices may be a viable and promising option for preparing and educating teachers effectively (Bean & Morewood, 2011; Peterson & Slotta, 2009). However, there has been a paucity of studies on how teacher educators are adjusting to the digital environments, particularly those that are pertinent to improving literacy instruction.

The aim of this exploratory review is to target digital practices that are perceived to be effective for improving literacy instruction by teacher educators in higher education. Specifically, the review is looking into the issues related to the following questions: 1) What digital practices are perceived to be effective by literacy teacher educators in their contexts; 2) how and why are those practices perceived to be effective; and 3) are there any patterns when comparing these practices across contexts?

II. Theoretical and Empirical Rationale

The pedagogical shift from analogue to digital calls for reflection on whether *best practices* in conventional environments can also be applied to the online world as they are (Bean & Morewood, 2011). For instance, the lesson study model, generally featured as teachers' mutual observation, evaluation, and reflection, has proven to be effective for teacher education and professional development (Liberman, 2009). That model has been referred to as a *best practice* in teacher education and professional development (e.g., Darling-Hammond, Hammerness, Grossman, Rust, & Shulman, 2005).

With the digital age, an online lesson study was developed and implemented into math teachers' professional development (Yursa &

Silverman, 2011). The digital version of lesson study was also proven to be effective, but the researchers also pointed out that "online lesson study could be an oxymoron" because video observation was technically inconsistent with its original purpose (Yursa & Silverman, 2011, n.p.).

Likewise, it is quite probable to assume that any effective practices in traditional environments cannot be copied into the digital world as they are. They need to be modified appropriately. Li and Akins (2005) argued that selective adaptation is inevitable when adopting a practice from face-to-face to digital. However, there is a dearth of research about how the best of traditional teaching could be adequately weaved into the digital environments, particularly in the field of literacy teacher education.

Also, this review is informed and justified by Reinking's (2007) critical comments on *best practices*. He explained why "seeking *best practices* in literacy instruction is not a good pursuit for the field" no matter what "these possible meanings include *best practices* as relatively good practice, as what most or expert teachers do, as achievement of valued outcomes, and as scientific evidence" (Reinking, 2007, p.75). His perspective has emphasized individual contexts in which teaching and learning occur. What works for one case may or may not work for another. Success or failure should be considered in correlation with contextual information. Reinking's position reconfirms the assertion that we cannot be sure if *best practices* in traditional environments are always successful in the digital world as well.

The purpose of this study is to better inform those who are interested in educating literacy teachers in the digital environments. Toward that end, more detailed studies may be needed for discussion on how digital environments alter teacher educators' perceptions of effective practices for enhancing literacy instruction. However, little is known about digital practices that are, if not *best*, *good* or *better* in teacher education, which is pertinent to enhancing literacy instruction (Reinking, 2007). This review sheds light on that issue.

III. Review Method

In order to look at teacher educators' perceptions, electronic searches for studies on digital practices for enhancing literacy instruction were conducted on the Google Scholar index (https://scholar.google.com). The search terms used with relevant combinations for this review were summarized briefly as follows: digital practices, online professional development, online teacher education, online literacy courses, technology integration, literacy teacher education, and/or improving literacy instruction. To supplement the electronic searches, an annotated bibliography was also examined (Beach et al., 2010).

Fifty-one studies were identified in this process. Many of them were excluded from the review because they did not meet the standards for selection. The criteria for selection of the final review were as follows: (1) must focus on digital(or online) practices for improving literacy instruction; (2) must focus on professional development(or teacher education) for the K–12 classroom literacy instruction; and (3) must be an empirical study published in a peer-reviewed journal. The final pool of studies that met all three criteria included 11 articles.

Digital practices perceived to be effective by literacy teacher educators were investigated in correlation with contextual information revealed in those 11 studies. To what end and how were those digital practices effectively perceived by literacy teacher educators? That was the key question that led to establishing a review framework for the representation of the digital practices identified effectively in those studies.

The review framework was basically drawn from the International Reading Association (IRA, 2010) Standards for Reading Professionals, which describe the knowledge, skills, and dispositions necessary for effective practice in literacy profession. IRA standards consisted of six key domains as follows: foundational knowledge, curriculum and instruction, assessment and evaluation, diversity, literate environment, and professional learning and leadership. These domains were adapt-

table 1. *Focus of 11 Studies Reviewed*

	(1)	(2)	(3)	(4)	(5)	(6)
Christ, Arya, & Chiu (2012)		X				
Jetton (2003)			X			
Karchmer-Klein & Shinas (2012)						X
Marsh, Lammers, & Alvermann (2012)	X					
McVee, Bailey, & Shanahan (2008)						X
Peterson & Slotta (2009)	X					
Schrader et al. (2003)			X			
Sharma & Pang (2015)		X				
Tracy, Scales, & Luke (2014)					X	
Ward, Lubke, & McGill-Franzen (2015)		X				
Woodcock (2009)				X	X	X

ed for the review. The digital practices identified as effective were connected to five of the six domains, excluding professional learning and leadership. One domain was required to be added.

Finally, the review framework consisted of six domains as follows: (1) digital discussions for constructing core knowledge; (2) digital teaching videos for comprehensive curriculum and evidence-based instruction; (3) online case studies for assessment, evaluation, and data-driven decision-making; (4) online networks or digital texts for diversity and social justice; (5) online dialogues for co-construction of a dynamic, interactive literate environment; and (6) new, multimodal literacy practices and technology integration. The 11 studies reviewed were briefly outlined with the framework in Table 1.

IV. Results

The findings from the review of the 11 studies and more are discussed in this section. The six domains presented previously are formatted into the section headings and organize this section.

• Digital discussions for constructing core knowledge

Teacher knowledge plays an important role in teaching. As Shulman (1986) revealed the complexities of teacher knowledge and knowledge growth, researchers in teacher education keep trying to explore the domains of teacher knowledge and the promising ways to develop such knowledge. Core knowledge assumes that teachers should have what is already known. Acquiring or mastering existing foundational knowledge is still believed to be important in literacy teacher education (IRA, 2010).

However, new knowledge building through analyzing, evaluating, and criticizing existing knowledge is taking on added significance for teacher education in the digital age. Teachers must know how to build knowledge in order to develop their students to participate in the creation of new knowledge in their everyday life.

Literacy teacher educators perceived digital discussions as an effective practice in core knowledge building (Marsh, Lammers, & Alvermann, 2012; Peterson & Slotta, 2009). Marsh et al. (2012) are the best example. In their content literacy course, students were put into online discussion groups to respond to well-organized reading materials. Those materials were carefully selected and had foundational knowledge in this field, emphasizing the relation between disciplinary knowledge and literacy instruction strategies. Students were asked to read those materials critically, post responses to the readings, and reply to other students' posts. The results from the qualitative analysis revealed that online discussion increased their understanding of literacy and disciplinary teaching by providing opportunities for analyzing, evaluating, and synthesizing.

Clarke and Watts-Taffe (2013) also introduced digital discussions as an effective practice in an online course taught by one of the authors. Her students were required to read the work of major theoretical perspectives in the field of literacy. Specifically, she found that the use of online discussion boards was really helpful when her students

had encountered new terms and concepts in the readings. She also realized that participating in digital discussions allowed her students to cumulatively construct knowledge. Another advantage of digital discussions she found was that it served as a window into their understandings and allowed her to correct their misunderstandings and scaffold deeper understandings. Her role as an instructor was clearly not a knowledge transmitter but a facilitator to help students construct knowledge.

In sum, literacy teacher educators perceived that digital discussions have a great potential to improve literacy teachers' core knowledge. Interestingly, teacher-centered approaches such as lectures based on the knowledge transition model were deemed invalid in digital discussions employed in their programs. Student-centered approaches such as peer discussions about readings, which led students to a variety of sources of knowledge and that helped them to digitally develop knowledge construction using various technologies, were perceived to be effective.

- Digital teaching videos for comprehensive curriculum and evidence-based instruction

Literacy teachers are expected to be able to design or implement comprehensive or integrated curriculum with appropriate and varied instructional approaches (IRA, 2010). A common practice in traditional teacher education for this purpose is providing an opportunity to design a lesson plan and discuss it with peers, either as a classroom activity or an assignment. However, there has been a lot of criticism that teacher educators have been successful in only getting teachers to talk a lot about teaching in classroom, but they have failed to influence their actual instruction because mere discussions on teaching without any concrete materials do not guarantee any improvements.

Clarke and Watts-Taffe (2013) showed how online environments can be effectively used for providing an opportunity to design a les-

son plan. They focused on engaging in peer feedback as part of the lesson design process in the online environment. Further, creating digital teaching videos based on a lesson plan and sharing them with peers to receive feedback on their actual teaching were perceived to be effective (Sharma & Pang, 2015). That was typically a collaborative activity to develop, discuss, implement, record, share, observe, and revise their lessons together. It allowed students to learn by actually watching others' teaching and by reflecting on their own teaching practice (Christ, Arya, & Chiu 2012; Sharma & Pang, 2015; Ward, Lubke, & McGill-Franzen, 2015).

More specifically, digital environments enabled students to watch others' teaching simultaneously with many of their peers and to provide instant and individualized feedback. For instance, although not in the field of literacy, Burrack (2012) used videoconferencing technology in ensemble clinics to offer practicing music teachers specific, instant, andindividualized feedback. Digital ensemble clinics proved to be crucial with direct impact on their instruction because they can have detailed and supportive feedback from their mentors, even from a long distance. That may be particularly applicable to many reading clinic courses that emphasize tailored instruction with students who are having problems in reading (Sharma & Pang, 2015).

- Online case studies for literacy assessment, evaluation, and data-driven decision-making

Literacy teachers are required to be proficient in data collection, interpretation, and instructional decision-making based on data (IRA, 2010). Toward that end, literacy teacher educators perceived digital environments as vital for more hands-on practices. For instance, Turbill (2002) said that "in the online setting, the data are all there for me to revisit whenever I need to" (p. 676).

Clarke and Watts-Taffe (2013) pointed out that online environments can provide literacy teachers with a data-rich environment for

hands-on assessment practice. They explained that there are a lot of materials, tools, and technologies to be easily integrated into formative and summative assessment (e.g., Google form). In addition, samples of student work for assessment practice are spread all over the Internet, and numerous samples of assessing literacy behaviors can be easily found on YouTube or TeacherTube. Specifically, Clarke and Watts-Taffe (2013) suggested "assessing together online" as an effective digital practice (p. 87). It would be a splendid idea to support them to become objective, reflective, and collaborative in assessment, evaluation, and decision-making.

Online case studies were perceived as another effective option for improving literacy assessment and evaluation. Jetton (2003) employed case-based online discussions to facilitate learning about literacy assessment. She concluded that case-based online discussions were effective because students could share information with their peers to gain multiple perspectives. Schrader et al. (2003) explored the effects of using multimedia cases on prospective teachers' learning. Their cases consisted of students' work, formal and informal assessments, and administrator, teacher, and student interviews that were accessible online. They also found that multimedia case studies were useful to gain multiple perspectives and opportunities toward collaboration.

- Online networks and digital texts for diversity and social justice

The IRA standards emphasize diversity and social justice, saying that literacy teachers "use literacy curriculum and engage in instructional practices that positively impact students' knowledge, beliefs, and engagement with the features of diversity, develop and implement strategies to advocate for equity" (IRA, 2010, p. 26).

There are few studies of literacy teacher education on effective digital practices in this domain. Instead, the digital environment itself has often been praised for its potential to increase diversity. Li and

Akins (2005) pointed out that "it is very common for students from different countries with different backgrounds to enroll in an online course" (p. 53) and "students often develop collaborative relationships with a wide range of people that are beneficial to their learning and working" (p.53). All participants in online teaching and learning can have better opportunities to communicate and interact with diverse people.

Particularly, the critical literacy class is often connected with this domain. Woodcock (2009) tried to empower teachers to become more critical, to value social justice, and to have a deeper understanding of cultural contexts. She viewed the nature of the online course (e.g., discursive, the use of technology, ongoing interaction) as integral for both diversity and social justice. She created multimodal networks for more dynamic and interactive discussions to foster critical literacy. She was assuming that "the online context provide a space for shyer students to have their voices heard and more freedom for highly critical discourse" (Woodcock, 2009, n.p.).

Interestingly, digital textbooks were also perceived as effective, if not simply used, for raising awareness of democracy and justice (Guzzetti, Young, Gritsavage, Fyfe, & Hardenbrook, 2002, Ch. 5, n.p.).

- Online dialogues for co-construction of a dynamic, interactive literate environment

Literacy teachers are supposed to create a supportive learning environment to foster their students' literacy. The IRA standards also emphasize the ability to design an interactive and dynamic literate environment for learning (IRA, 2010). Clarke and Watts-Taffe (2013) suggested two potential effective practices. One is to incorporate reflection about a co-constructive literate environment into discussion board or VoiceThread posts. The other is to create a literary environment observation and feedback assignment.

Woodcock (2009) viewed that online dynamic and interactive dia-

logues were effective as much of the pleasure from reading children's literature came from dialogues from thinking, talking, and even arguing about it with others. Tracy, Scales, and Luke (2014) also regarded the online course as a dynamic, interactive, and co-constructive environment. They found that the predominant method of communication, collaboration, and shared understanding in online courses was in a written format. As a result, the online course itself was a dynamic, interactive, and co-constructive environment.

- New, multimodal literacy practices and technology integration

This domain was added to meet the new demand of teachers to help students develop new literacy practices in the 21st century. Even though new, multimodal literacy and technology integration were categorized into one domain, they are all different concepts, and their focuses are all different. Multimodal literacy practices focus on the text, new literacy focuses on the individual student, and technology integration focuses on teachers (Jacobs, 2013).

Literacy teacher educators were making various attempts in digital environments related to new, multimodal literacy practices and technology integration. From the perspective of multimodal literacy, Karchmer-Klein and Shinas (2012) explored ways to increase students' multimodal literacy using a virtual poster tool, *Glogster*. Woodcook's (2009) online course also proved effective related to the concept of multimodal literacy, which emphasized the various forms of representation. McVee, Bailey, and Shanahan (2008) allowed their students to explore new literacies, media, and technology in a graduate course, and they concluded that "teaching about new literacies and technology integration should indeed remain an important part of our teacher education program" (p. 208). Technology integration is inherent in digital practices. Teacher educators were assuming that students' participation in digital practices itself would increase technology integra-

tion in their own classroom teaching (McVee et al., 2008).

V. Conclusion

Many literacy teacher educators are not just trying to copy traditional practices to the online world. They are well aware that instructional practices in the face-to-face and online environments have different effects and consequences. They are trying to make the best possible use of the resources available in digital environments for instruction in their contexts. At this point in time, it is really difficult to set rigorous standards to discern what digital practices are effective or not effective for improving literacy instruction. This review can only provide glimpses of their real nature in literacy teacher educators' perceptions.

However, it seems that there is one main principle in literacy teacher educators' perceptions. Digital practices based on a social constructivist theory or student-centered models, such as learning by doing, observing, and reflection, were perceived to be more effective in the online environment. Why are digital practices based on teacher-centered models such as lecturing perceived to be ineffective by literacy teacher educators? One reason is that the social constructivist theory has already had a great influence in various aspects of practice and research in the discipline of literacy (Au, 1998; Oldfather & Dahl, 1994; Wilkinson & Silliman, 2001). Another is teacher-centered practices such as knowledge transmission caused students to become bored or overwhelmed by too much information provided by the digital space.

* Submitted 2017.11.9.
First revision recieved 2017.12.13.
Accepted 2017.12.13.

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ABSTRACT

A Review of Effective Digital Practices for Improving Literacy Instruction

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The purpose of this review is to investigate what digital practices are perceived as effective by literacy teacher educators. Specifically, this review addresses the following questions: (1) What digital practices are perceived to be effective by literacy teacher educators in their contexts; (2) how and why are those practices perceived to be effective; and (3) are there any patterns when comparing these practices across contexts? Eleven studies are reviewed. As a result, literacy teacher educators' perceptions about effective practices are classified into six domains: (1) digital discussions for constructing core knowledge, (2) digital teaching videos for comprehensive curriculum and evidence-based instruction, (3) online case studies for literacy assessment, evaluation, and data-driven decision making, (4) online networks and digital texts for diversity and social justice, (5) online dialogues for co-construction of a dynamic, interactive literate environment, and (6) new, multimodal literacy practices and technology integration. This review concludes that, in digital environments, instructional practices based on a social constructive theory or student-centered models such as learning by doing, observing, and reflection are perceived to be more effective than teacher-centered models by literacy teacher educators.

KEYWORDS Digital practices, Literacy instruction, Literacy teacher education, Professional development