Literacy in the Digital Age

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ABSTRACT
21st century learners arrive at school with technological knowledge and skills that necessitate the need for educational systems to transform instructional practices to meet learners' needs. The International Society for Technology in Education (ISTE) developed ISTE Standards for students, teachers, administrators, coaches, and computer science educators that define best practices and standards of excellence with technology. Literacy educators are greatly impacted by the technological shift in education and require a deep level of proficiency with the ISTE Standards for Teachers. The purpose of this article is to provide an overview of the ISTE Standards for Teachers and provide literacy educators with an evaluative tool to measure their adeptness with the knowledge and skills needed to teach in the digital age.

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The definition of "literacy" has recently been expanded to include "digital, electronic, and visual expressions" (Gentry & McAdams, 2013, p. 4253), and educational institutions are expected to meet learners' needs through the integration of 21st century skills. According to the Assessment and Teaching of 21st-Century Skills Consortium (2014), success in the 21st century requires mastery of the following critical skills: information literacy, creativity and innovation, collaboration, problem solving, communication, and responsible citizenship. Learners today are sometimes referred to as "digital natives" (Prensky, 2001, p. 1) and "Net Geners" (Turner & Carriveau, 2010, p. 17) because of their exposure to digital tools throughout their entire lives. However, exposure to digital tools does not equate to mastery of the six critical 21-century skills. Moreover, many literacy educators fail to acknowledge or utilize these new practices, and research holds the importance of educators to connect learners' digital knowledge and capabilities to academic content (Considine, Horton, & Moorman, 2009).

The International Society for Technology in Education [ISTE] (2012) developed the ISTE Standards (formerly known as the National Educational Technology Standards [NETS]), which define best practices and standards of excellence with technology for various stakeholders in education: students, teachers, administrators, coaches, and computer science educators. Students' increasing levels of proficiency with digital knowledge and skills, as well as the accessibility of technology both inside and outside of school environments, require transformation of traditional educational practices. Literacy

educators play an important role with this transformative process and are becoming increasingly more proficient with digital technologies resulting from several national technology initiatives and participation in professional development experiences (McAdams, 2013).

The purpose of this article is to provide an overview of the ISTE Standards for Teachers and provide literacy educators with an evaluative tool to measure their adeptness with the knowledge and skills needed to "teach, work and learn in an increasingly connected global and digital society" (ISTE, 2012, para.1). ISTE Standards for teachers outlined five standards:

(1) Facilitate and Inspire Student Learning and Creativity,
(2) Design and Develop Digital Age Learning Experience and Assessments,
(3) Model Digital Age Work and Learning,
(4) Promote and Model Digital Citizenship and Responsibility, and
(5) Engage in Professional Growth and Leadership. (ISTE, 2008)

Within each of the ISTE Standards for teachers, four performance indicators further defined digital knowledge and skills required when designing, implementing, and assessing effective learning experiences for 21st century learners.

Overview of the ISTE Standards for Teachers

Standard 1: Facilitate and Inspire Student Learning and Creativity

Prensky (2010) asserted that teachers must merge their knowledge of pedagogy, subject matter, and technology to create an enriching learning environment. Learners arrive at school "deeply and permanently technologically enhanced" (p.2). Thus, many learners enter classroom already skilled with technology tools and functions to interact with their peers, connect to the world, and access information. However, Leu, O'Byrne, Zawilinski, McVerry, & Everett-Cacopardo (2009) pointed out that students' access to the Web varies greatly and pronounced inequities exist among schools and school districts. With this in mind, Greenhow, Walker, and Kim (2010) suggested that teachers develop a thorough understanding of contextual factors by answering the following questions about the students in their classes:

- Are students accessing the Web?
- Where are students accessing the Web (e.g., home, school, public library)?
- How often are students accessing the Web?
- How are students using the Web?
- What perceptions do students have regarding their own proficiency with using the Web?

Teachers must also look beyond the use of technology as a means for delivery of information and capitalize on innovative uses of technology to revolutionize instruction and transform learning experiences (Resnick, 2002). Within the context of literacy instruction, Bogard and McMackin (2012) defined innovation with technology as "practices for making meaning that transcend language and include photography, art, music, video, or audio representations" (p. 314). Examples of innovative uses of technology during literacy instruction include student-produced products, such as digital story expressions (McAdams & Gentry, 2014) and movies (Young & Rasinski, 2013); instructional use with electronic devices, such as smartphones (Bromley, 2012) and

tablets (Hutchison, Beschorner, & Schmidt-Crawford, 2012; Northrop & Killeen, 2013); and incorporating interactive Internet-based tools, such as online book clubs (Scharber, 2009) and Twitter (Morgan, 2014). Through these innovative approaches, literacy instruction includes language and social practices.

Standard 2: Design and Develop Learning Experiences and Assessments

Effective teachers design, develop, and evaluate authentic learning experiences with the aid of technology (ISTE, 2008). Technology tools are diverse, and many can be fully customizable (Hobgood & Ormsby, 2010). For assessment purposes, handheld devices are excellent tools to collect and analyze data to monitor students' literacy skills, such as reading fluency (Tovar, Hansen, & Puckett, 2011), as well as preserve anecdotal records through use of note-taking applications (Bates, 2013). Instructionally, apps on tablet devices are capable of targeting a plethora of literacy skills, including early literacy skills (Northrop & Killeen, 2013); writing skills (Clary, Kigotho, & Barros-Torning, 2013); and reading skills (Hutchison et al., 2012). Through effective technology integration, teachers can monitor students' performance and differentiate instruction based upon the learners' needs.

Today's learners are viewed as expert multi-taskers and natives to technology, so teachers must be prepared to craft learning experiences geared towards these learners' needs (Prensky, 2010). With this in mind, teachers must also keep in mind that learners often arrive in classrooms appearing self-sufficient and adept with their personal use of technology (Thompson, 2013). However, learners still require scaffolding from their teacher in order to move beyond their comfort level and explore technology tools more suited for the academic environment. Therefore, teachers must continue to rely upon their pedagogical understandings when infusing technology into well-designed learning experiences and assessments.

Standard 3: Model Digital Age Work and Learning

The ISTE Standards for Teachers (2008) articulated the importance of teachers demonstrating technological fluency, as well as the ability to apply current digital knowledge to new situations and new technology tools. In order to be digitally fluent, teachers require knowledge related to the use of technology tools, in addition to how to use these tools to create relevant products (Resnick, 2002). While most teachers possess a level of proficiency with basic technology tools and functions, such as using a word processor, reading and sending emails, and locating information on the Internet, some teachers still lack fluency and mastery with more advanced digital tools and functions.

In order to maximize the full benefits available to learners with technology, teachers must be digitally fluent (Clements, Nastasi, & Swaminathan, 1993; Keengwe & Onchwari, 2009). According to Keengwe and Onchwari (2009), learners in classrooms with digitally fluent teachers showed gains in verbal and nonverbal communication, increased with problem solving abilities, and improved with abstraction and conceptual skills. Effective integration can be a difficult task, and teachers may not have adequate preparation at first to fulfill that task (Woodbridge, 2004). Keengwe and Onchwari (2009) asserted the importance of equipping teachers with frequent technology training and skills to support effective technology integration into classroom instruction.

Standard 4: Promote and Model Digital Citizenship and Responsibility

According to the ISTE Standards for Teachers (2008), teachers must promote and model digital citizenship and responsibility. In addition to being a good citizen with technology use, digital citizenship includes user security and safety, legal and ethical technology practices, and enhancement of academic content (Hollandsworth, Dowdy, & Donovan, 2011). Ohler (2011) emphasized the importance of schools addressing this "digital health initiative" (p. 26), particularly with a significant rise with inappropriate digital behavior among young persons, such as cyberbullying and sexting.

Teachers must ensure that learners understand the rights and responsibilities associated with technology use (Hollandsworth et al., 2011). This includes presenting learners with a digital code of conduct that clearly outlines appropriate and inappropriate uses of technology. Students must be taught how to protect their privacy, as well as how to exercise freedom of speech responsibility in a virtual environment. Students must also be taught to respect the intellectual property of others online and how to obtain media from the Web legally. In this same manner, teachers must also provide explicit instruction to learners with how to use technology as a tool to advance their learning. Addressing responsible digital behavior among students must begin in kindergarten and continue throughout each grade thereafter.

Standard 5: Engage in Professional Growth and Learning

The final standard for teachers concerns professional growth (ISTE, 2008). Professional growth derives from the consultation of current research coupled with the evaluation and reflection of teaching practices. Effective use of technology first requires a specific purpose in mind to foster learners' understandings of content using Web 2.0 tools. Web 2.0 takes the "read-only" aspect of Web 1.0 and facilitates a "read-and-write" atmosphere for users (Greenhow et al., 2009, p. 247). Greenhow et al. described how the Web could serve as an "information repository that could promote richer inquiry experiences for learners" (p.246). The integration of Web 2.0 tools during classroom instruction fosters active participation, collaboration among peers, and distributes technology practices among learners (Knobel & Lankshear, 2006).

However, Leu et al. (2009) asserted the importance of framing the Web as a literacy issue, rather than a technology issue. In doing so, educational policies are likely to support the integration of technology standards throughout content area standards, which paves the way for integrating instruction with the Web during content-area instruction. Thus, all teachers assume a responsibility for teaching and assessing students' knowledge and skills related to the Web.

With this in mind, teachers must engage in continuous professional growth and learning. Koehler, Mishra, and Yahya (2007) proposed a framework to describe the required digital knowledge for teachers: technological pedagogical content knowledge (TPCK). TPCK occurs from the intersection of technological knowledge, pedagogical knowledge, and content knowledge, which according to Koehler et al., are developed best through collaborative, constructivist, and project-based approaches. Bourgeois and Hunt (2011) also described a school-based teaming approach, the Digital Learning Collaborative. In this approach, three essential elements are present: (1) teachers consider the use of technology in the classroom, (2) teachers learn how to master use of a technological tool, and (3) teachers work in collaborative teams consisting of three to five

members for support. According to Bourgeois and Hunt, learning requires time and is optimal in a social context. Most importantly, in order to be meaningful, sound instructional practices must be woven throughout all learning experiences.

An Evaluative Tool for Literacy Educators

Developing a more thorough understanding of the best practices outlined in the ISTE Standards for Teachers enables literacy educators to identify strengths and areas requiring improvement. With this in mind, the following evaluation form, "Best Practices for Digital Age Teaching: An Evaluation Tool for Literacy Educators," (see Appendix 1) was created by the author as a mechanism for literacy educators to measure their perceived level of proficiency with each knowledge and skill for digital age teaching articulated in the ISTE Standards for Teachers. Once literacy educators complete the "Best Practices for Digital Age Teaching" form, they may analyze data, either individually or collectively, to determine areas of strength, as well as areas requiring improvement, with each of the five ISTE standards.

Individual analysis of data from the "Best Practices for Digital Age Teaching" form may serve as a guide for a literacy educator's plan for professional development. Literacy educators at a school campus might decide to conduct a campus-wide analysis of results from completed evaluation forms to serve as data for the development of their school's campus improvement plan. Likewise, school districts may also engage in strategic analysis of data from the "Best Practices for Digital Age Teaching" form provided by literacy educators throughout a school district when deciding how to best allocate funds to support schools with technology initiatives. Moreover, results from this evaluative form would provide colleges of education with specific information to better prepare literacy educators for public school service and ensure that university curricula address the required knowledge and skills prospective literacy educators require for effective digital age teaching

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Appendix 1: Best Practices for Digital Age Teaching: An Evaluation Tool for Literacy Educators

Directions: For each statement below, select a rating that best describes the level of frequency you apply each knowledge and skill during your professional practice.

Standard 1: Facilitate and Inspire Student Learning and Creativity	**Never 0**	**Rarely 1**	**Sometimes 2**	**Often 3**	**Always 4**
I promote, support, and model creative and innovative thinking and inventiveness.					
I engage students in exploring real-world issues and solving authentic problems using digital tools and resources.					
I promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.					
I model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.					

Standard 2: Design and Develop Learning Experiences and Assessments	**Never 0**	**Rarely 1**	**Sometimes 2**	**Often 3**	**Always 4**
I advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.					
I address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.					
I promote and model digital etiquette and responsible social interactions related to the use of technology and information.					
I develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital age communication and collaboration tools.					

Standard 3: Model Digital Age Work and Learning	**Never 0**	**Rarely 1**	**Sometimes 2**	**Often 3**	**Always 4**
I demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.					
I collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.					
I communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital age media and formats.					
I model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.					

Standard 4: Promote and Model Digital Citizenship and Responsibility	**Never 0**	**Rarely 1**	**Sometimes 2**	**Often 3**	**Always 4**
I participate in local and global learning communities to explore creative applications of technology to improve student learning.					
I exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.					
I evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.					
I contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of my school and community.					

Standard 5: Engage in Professional Growth and Learning	**Never 0**	**Rarely 1**	**Sometimes 2**	**Often 3**	**Always 4**
I design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.					
I develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.					
I customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.					
I provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching.					

Directions: Tally your scores within each standard below:

Standard 1: Facilitate and Inspire Student Learning and Creativity	
Standard 2: Design and Develop Learning Experiences and Assessments	
Standard 3: Model Digital Age Work and Learning	
Standard 4: Promote and Model Digital Citizenship and Responsibility	
Standard 5: Engage in Professional Growth and Learning	

Analyze your results and respond to the following questions:

- What are your areas of strength?
- What areas require improvement?
- Do you require more professional development with content related to a specific knowledge or skill?

- Do you require more professional development with how to implement a specific knowledge or skill effectively?