Innovate Literacy Instruction with a Classroom Computer: A Solid Rationale for the Integration of Specific Digital Tools

Laurie McAdams
Tarleton State University

Abstract

The digital age has impacted education and how teachers prepare students to master 21st century literacies. Numerous national, state, and local entities have made the integration of technology into the literacy curriculum a priority, and teachers are becoming more proficient with their use of digital tools. However, integrating technology to develop students' literacy should be rooted in research-based best practices. This article provides a rationale to support the integration of specific digital tools to foster students' literacy development.

The impact of the digital age within education is evidenced by the inclusion of "digital, electronic, and visual expressions" in the most current definition of literacy (Gentry & McAdams, 2013). Technology is not only a vehicle with which to develop literacy; it is a form of literacy. Over the last several years, national, state, and local entities have made the integration of technology in education a priority and focused efforts to address this newly recognized form of literacy. For example, in 2010, the National Education Technology Plan presented a model of learning driven by technology (U.S. Department of Education [DOE], 2010). Goals and recommendations were made in the following areas:

- Learning – Students' learning experiences must be engaging and empowering.
- Assessment – Assessments that measure technology-driven learning experiences are needed. Moreover, decisions to improve student learning should be data-driven through appropriate use of technology-based assessments.
- Teaching – Educators must be continuous learners with technology and work collaboratively with resources to improve student learning.
- Infrastructure – A concerted effort is needed to ensure schools address all infrastructure issues related to use of technology.
- Productivity – Technology in education is an essential component for planning, managing, monitoring, and reporting purposes among all educational stakeholders.

Increasing technology demands placed on educational entities also sparked support for educational professionals from professional membership associations, such as the International Society for Technology in Education (ISTE), and groups, such as the National Writing Project (NWP). The ISTE (2012) provides a forum for educational

stakeholders to move forward in their efforts to improve learning and teaching with effective use of technology. Likewise, the NWP (2013), a professional development network for teachers, focused on improving the teaching of writing throughout all content areas. The NWP launched a Technology Initiative (TI) in 2004 aimed at developing quality writing programs within schools that supported thoughtful technology integration, expanded opportunities for teachers at local sites to access professional development and resources for technology and the teaching of writing, and connected local sites and teachers with valuable resources to support 21st century literacies.

Through the multitude of technology initiatives and professional development experiences, teaching professionals are becoming more familiar with digital tools, such as blogs, wikis, and various software packages, and integrating them into their literacy instruction. However, it is imperative that the digital tools are not just a novelty. Rather, teaching professionals must be intentional with their selection of digital tools and possess a strong understanding of how the integration of specific digital tools enhances students' literacy development. The purpose of this article is to provide educational professionals with a research-based rationale that supports best practices associated with the integration of specific digital tools during literacy instruction with a classroom computer.

The Need for Professional Expertise

As schools continue to support the integration of technology, teachers must ensure they possess the required technological knowledge and skills to foster an effective technology-rich environment. Gentry and McAdams (2013) explored how the use of technology facilitated content learning in social studies with middle school students. Results showed that while teachers valued the integration of technology into instruction and were eager to learn technological skills from their students, they did not view technology instruction or the ability to model effective use of technology as part of their responsibilities.

In order for technology integration to be optimal, it is essential that teachers possess, as well as continually develop, their own digital proficiency. The ISTE (2008) developed National Educational Technology Standards (NETS), which specify the knowledge and skills education professionals require to learn, work, and teach in a digital society. For teaching professionals, the NETS describe specific knowledge and skills in the following areas: a) facilitate and inspire student learning and creativity, b) design and develop digital age learning experiences and assessments, c) model digital age work and learning, d) promote and model digital citizenship and responsibility, and e) engage in professional growth and leadership.

Tool by Tool Rationale to Foster Literacy Development

Wikis

The wiki provides opportunities for students to engage in both reading and writing tasks (Pifarre & Fisher, 2011). While students act as readers and writers simultaneously, they develop the higher order thinking skill of evaluation when reading their peers' contributions. In this same manner, students are improving their own revising skills through their individual contributions to writing in the wiki. Through writing, the wiki enables students to share, discuss, and debate ideas. The wiki also provides the teacher with a unique source of documentation that preserves the development of writing through students' collaborative efforts.

Pifarre and Fisher (2011) conducted a study involving the use of wikis with students ages nine and ten. According to Pifarre and Fisher, the wiki was an effective form of technology to incorporate as a digital tool during writing instruction because it provides all educational stakeholders "a window on the process of composition" (p. 453). In doing so, the process of writing is able to broken down and tracked, which requires students to become more engaged with reviewing what is written. Moreover, teachers and researchers have a written account of all writing that has taken place.

Hypermedia Authoring

Hypermedia authoring is defined as web page design that incorporates a variety of digital tools (Chang, Sung, & Zheng, 2007). As students engage in hypermedia authoring activities, they tend to focus on one aspect of the content, rather than connecting all of the components together. Hypermedia authoring also has the potential to constrain students' creative thinking due to students' unfamiliarity with the system and unrelated activities that cause distractions.

In order to utilize hypermedia authoring more effectively during writing instruction, Chang et al. (2007) adapted Lehrer's writing process to design five-stage process for hypermedia authoring:

1. Establish the topic and set goals: Once students determine the topic they intend to address, they must first review their knowledge about the topic, set goals for the intended final product, and determine how information for the webpage will be collected.
2. Planning: Next, students create an outline for the content in their webpage by making a list consisting of only titles.
3. Organization: Following the outline created during the planning stage, students arrange the structure of their webpage by organizing the layout of the content.
4. Construction of content: Students collect information related to their topic from a variety of sources and build content through the use of digital tools to incorporate into their webpage.
5. Review and evaluate: Finally, students review their completed webpage and evaluate it for completeness and clarity of structure and content.

Computer-Generated Graphic Organizers

Research shows that student use of graphic organizers creates more competent readers and writers (Lorenz, Green, & Brown, 2009). Graphic organizers enable writers to stay on topic by organizing ideas in a spatial form, provide a way for students to connect their prior knowledge to their writing, and assist students with the recall of information. Lorenz et al. studied the use of computer software with young students to assist with graphic organizer completion during the planning phase of writing. Kidspiration© software was utilized to create graphic organizers as students planned for a narrative writing assignment in this study. Popplet (popplet.com) and concept board (conceptboard.com) are other computer applications used to create graphic organizers, too. Findings from this study showed that the use of computer-generated graphic organizers fostered development of organizational skills among young students (Lorenz et al, 2009). Students in this study also displayed more verbal enthusiasm with use of the computer-generated graphic organizer compared to the traditional paper template graphic organizer. Moreover, findings showed that students were more focused during writing sessions and were willing to work for longer periods of time.

Author's Computer Chair

Similar to an Author's Chair in a writing workshop classroom, the Author's Computer Chair is a designated time and place where students "discuss computer-related processes of meaning making" (Labbo, 2004, p. 688). Students can use this time to discuss current projects involving the use of the computer, demonstrate the use of digital tools on the computer, share an email communication, or share a digitally-created product. Labbo articulated five guidelines necessary for teachers to establish a classroom environment that fosters successful implementation of the Author's Computer Chair:

1. The learning environment and social atmosphere of the classroom must create a safe classroom environment where students share ideas, receive feedback, and work collaboratively with peers.
2. Teachers must continuously model and demonstrate appropriate use of the Author's Computer Chair through strategically-planned minilessons.
3. Teachers must intentionally schedule daily or weekly time for the Author's Computer Chair.
4. Teachers must encourage students to share digitally-created products at all stages of development.
5. Teachers must incorporate regular discussion routines for students to become accustomed to the Author's Computer Chair.

Digital Writing Communities

Digital writing communities provide a multitude of opportunities for teachers to address specific needs of all writers, including students with exceptional writing talent (Olthouse & Miller, 2012), students with learning disabilities (Jones, 2012), and young writers within the early stages of writing development (Pifarre & Fisher, 2011). Providing

frequent opportunities for all students to develop literacy through the strategic integration of digital tools promotes innovation with instructional design and assists with students' development of digital competencies through participatory and collaborative contexts.

Online writing communities

Online writing communities provide student writers with a forum consisting of other writers (Olthouse & Miller, 2012). Online writing communities are especially beneficial for students with exceptional writing abilities because this forum provides a level of support from peers with similar abilities outside of the classroom. Due to the lack of control teachers have, online writing communities are most appropriate for older students. Popular online writing communities for secondary age students include Figment.com and Teenink.com.

Kidblog

Kidblog (http://kidblog.org/home/) provides a safe blogging space for all students to practice responsible digital citizenship through a socially-driven digital tool (Kidblog, n.d.; Olthouse & Miller, 2012). Teachers maintain administrative control over students' accounts and blogs, which are also only accessible by the teacher and students in the class. Other guests, such as parents, can be added by the teacher.

Glogster EDU

Glogster EDU (http://edu.glogster.com/) is an online platform through which all students create glogs. Glogs are online posters enhanced with digital tools, such as videos, text, photographs, sounds, data attachments, drawings, or graphics (Glogster EDU, n.d.; Olthouse & Miller, 2012). Creating glogs on Glogster EDU is safe because teachers create private classrooms via the website, which generates individual student accounts accessible with safe logins and passwords. The teacher is able to monitor activity within all student accounts at all times. Templates for glogs are available, and the teacher is able to create assignments for students, give instructional guidelines, provide feedback to students throughout the creation of their glogs, and assess the completed project. Glogs can also be shared on a webpage, in a wiki, or embedded in a blog.

Storybird

Storybird (http://storybird.com/) is a virtual platform where all students can create original written works using artwork from animators and illustrators from all over the world (Olthouse & Miller, 2012; Storybird, n.d.). Teachers create classes and provide safe access for students; all work remains private unless the teacher chooses to provide access to specific individuals. Teachers can create assignments, review work at all stages of creation, and assess students' work.

Conclusion

As education continues to embrace student development of 21st century literacies, teachers must ensure they have a solid rationale for the integration of specific digital tools. Selection of a specific digital tool should be rooted in research-based best practices, and

teachers must also ensure they possess the required knowledge and skills regarding effective use of the digital tool so they may assist students when needed. As teachers move forward in developing their expertise with technology integration during literacy instruction, support from school campus administration, as well as all other educational stakeholders is necessary.

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