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Digital storytelling : building 21st century literacy skills in the secondary classroom

William P. Lammers
University of Northern Iowa

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Digital storytelling has been a popular activity in technologically well-equipped classrooms, and is gaining popularity due to its ability to help build important 21st century skills for learners and engaging lessons for instructors. This paper reviewed twenty peer-evaluated investigations from 2001 to 2010, citing five original qualitative case studies, twelve research-based papers regarding digital narratives and the skills needed for the 21st century learner. Included in this review is a definition of digital storytelling via a detailed model, an explanation of the 21st century literacies, obstacles to integrating digital narratives, and discussion of related communication skills. Recommendations were made based upon the review encouraging the continued implementation of digital narratives in the classroom, and the promotion of this activity as a viable skill builder.

DIGITAL STORYTELLING: BUILDING 21ST CENTURY LITERACY SKILLS IN THE SECONDARY CLASSROOM

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William P. Lammers

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Leigh Zeitz
Graduate Faculty Reader

5/16/2012
Date Approved

Karla Krueger
Graduate Faculty Reader

5-18-12
Date Approved

Jill M. Uhlenberg
Head, Department of Curriculum and Instruction

Abstract

Digital storytelling has been a popular activity in technologically well-equipped classrooms, and is gaining popularity due to its ability to help build important 21st century skills for learners and engaging lessons for instructors. This paper reviewed twenty peer-evaluated investigations from 2001 to 2010, citing five original qualitative case studies, twelve research-based papers regarding digital narratives and the skills needed for the 21st century learner. Included in this review is a definition of digital storytelling via a detailed model, an explanation of the 21st century literacies, obstacles to integrating digital narratives, and discussion of related communication skills. Recommendations were made based upon the review encouraging the continued implementation of digital narratives in the classroom, and the promotion of this activity as a viable skill builder.

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Introduction

Digital imaging plays a profound role in our world, from portable computing devices that use still and video cameras, to dedicated recorders that capture remarkably high quality video and require little practice. Creating artifacts of personal events, student projects, teacher evaluations, and professional presentations is viewed as a necessity for success in the workplace and the classroom. Digital storytelling extends these activities into classroom instruction, which allows for the creation of personal narratives, stories that inform or instruct, and stories that examine historical events (Robin, 2008). This powerful classroom activity can be used to support the instruction of 21st Century literacies. Knowing what skills this technology promotes and builds for digital natives, and how it accentuates the secondary curriculum is key to supporting the use of digital storytelling in practical and efficient methods.

Paramount to understanding this relationship is identifying how digital video builds and strengthens 21st Century literacies. Technology, including digital storytelling, allows students to gather, evaluate, and synthesize information, then reconfigure and present that information in ways that are both meaningful to the learner and demonstrate skill mastery (Brown, Bryan, & Brown, 2005). Simply understanding current technology is only part of comprehending ever-changing modern literacy demands. It is important for educators to know which literacies digital storytelling will build to assist educators in planning meaningful, effective assignments and activities.

This review will define and analyze the topic of digital storytelling and the core classroom skills it builds as it applies to the secondary level. It will also seek to explore the following questions:

- How is digital storytelling defined?
- What 21st Century literacy skills are enhanced by digital storytelling?
- What obstacles to implementing digital storytelling with grades 7-12 students exist, and how can they be overcome?
- How do digital stories provide evidence of student achievement in skill development?

This literature review should be used for identifying, applying and developing materials at the secondary level that use digital storytelling to build identified skills.

Methodology

Locating resources for this review required accessing online databases and indeciesof scholarly literature indexes. Resources were found using ERIC (EBSCO), ERIC (U.S. Department of Education), WilsonWeb Education Full Text, and Google Scholar. Descriptors and keywords used in database searches included: *digital storytelling, student-produced video, media studies, filmmaking, communication skills, K-12, 21st Century literacies, video production,* and *student media.* The sources of information were selected by reading the abstract of each work to identify keywords and descriptors used for this research.

In order to be included in the review, the following criteria was used to evaluate the sources of information:

- Authors extensively researched or had experience teaching and reflecting upon digital storytelling.
- The year in which they were written (between 1999 and 2011).
- Published in a scholarly journal or web publication of a reputable organization.
- Articles and studies were peer-reviewed.

In addition to electronic databases, queries of instructors who have used student produced digital video in their classrooms were conducted for additional articles, authors, and resource material.

Analysis and Discussion

In the process of examining the research questions, preliminary information will be provided by defining what digital storytelling is and identifying the 21st Century literacies that digital storytelling supports. Next, a rationale will be provided as to why it is used in the classroom. Research demonstrating how digital storytelling enhances 21st Century skills will then be presented, followed by obstacles that are commonly experienced by classroom instructors. The final part of the analysis and discussion will explore the areas where digital storytelling increases student achievement.

Defining Digital Storytelling

Digital storytelling is not just re-telling or creating a story using video or visual electronic media. Chung (2007) presented the definition of digital storytelling, developed by the Digital Storytelling Association, as "the modern expression of the ancient art of storytelling. Digital stories derive their power

through weaving images, music, narrative and voice together, thereby giving deep dimension and vivid color to characters, situations, and insights" (p. 17). Kieler (2010), in her reflection and analysis of digital storytelling, stated that it was the practices of combining the traditional sense of a narrative with digital content to create short movies that contains a strong emotional component.

Sylvester and Greenidge (2009) provided a model for creating effective digital stories based on a combination of seven elements:

Point of view: the specific realization the author is trying to communicate within the story.

Dramatic question: a conflict from the beginning that would hold viewers' attention until the story is completed.

Emotional content: the fundamental emotional paradigms such as love and loneliness, confidence and vulnerability, acceptance and rejection.

Economy: language in relationship to the narrative.

Pacing: the rhythm of a story to sustain an audience's interest.

The gift of voice: employing the pitch, inflection, and timbre of one's own voice to narrate the story.

Soundtrack: music to enhance the story and create an emotional response (p.287).

Other models existed regarding the structure and definition of digital storytelling that this author chose not to cite. They were essentially variations of the above model, and cited Sylvester and Greenidge in their work.

Identifying 21st Century Skills

In recent years, a variety of skills has been identified as essential to learners in the 21st century. While no one document identified all of them by name, these are the literacies that are most commonly identified by researchers:

Media Literacy.

According to Sylvester and Greenidge (2009), media literacy covered the necessary skills to access, evaluate, and create messages in written and oral language, graphics and moving images, and audio and music. Brown, Bryan, and Brown (2005) cautioned that the term was commonly misapplied to or generically used to identify the study of all media, or the survey of media in an educational setting.

Technology Literacy.

While each researcher had differently worded definitions of what technology literacy was, in general they all agreed that it was the ability to use computers and other technology to improve learning, productivity, and performance (Brown et al., 2005; Kieler, 2010; Robin, 2008; Sadik, 2008; Sylvester & Greenidge, 2009).

Digital Literacy. Robin (2008) defined this literacy as ability to communicate with an ever-expanding community to discuss issues, gather information, and seek help. Brown, Bryan, and Brown, (2005) cautioned that it was commonly mistaken for or used incorrectly to define technology literacy.

Global Literacy. Robin (2008) stated that this literacy was defined as "the capacity to read, interpret, respond, and contextualize messages from a global perspective" (p. 224).

Visual Literacy. Sylvester and Greenidge (2009) asserted that this is one of the oldest literacies. Robin (2008) described this literacy as "the ability to understand, produce, and communicate through visual images" (p. 221).

Information Literacy. Both Robin (2008) and Sylvester and Greenidge(2009) stated that this literacy was the ability to find, evaluate, and synthesize information, in both analog and digital formats. They also claim that information literacy is included in most state standards.

Digital Storytelling Rationale

Yerrick and Ross (2001) asserted in their research "the technological innovation with the greatest potential to affect classroom instruction is desktop digital video" (Strategies section, para. 2). Understanding how technology was integrated in the classroom was central to successfully including using digital film. Sadik (2008) defined meaningful technology integration as "curricula utilizing authentic tasks that intentionally and actively help learners to construct their own meanings from thinking about experiences and allows for more interdisciplinary project-based instruction" (p. 448). This is the essence of the constructivist theory.

The emergence of digital storytelling is considered by many to be the most engaging activity to take advantage of user contributed content. Robin (2008) contended "at its core, digital storytelling allows computer users to become creative storytellers through the traditional processes of selecting a topic, conducting some research, writing a script, and developing an interesting story" (p. 222). The combination of newer hardware with unprecedented power with affordable and accessible software make this activity a realistic opportunity in today's classrooms.

Robin also concludes that because of skills that are required to construct digital narratives, the technology allows for educators to provide deeper learning opportunities and "systemically integrate the use of technology for instruction" (p. 221). Figure 1 illustrates how this influx of affordable technologies interacts with and supports the agenda linked to meaningful student engagement and 21st Century literacies.

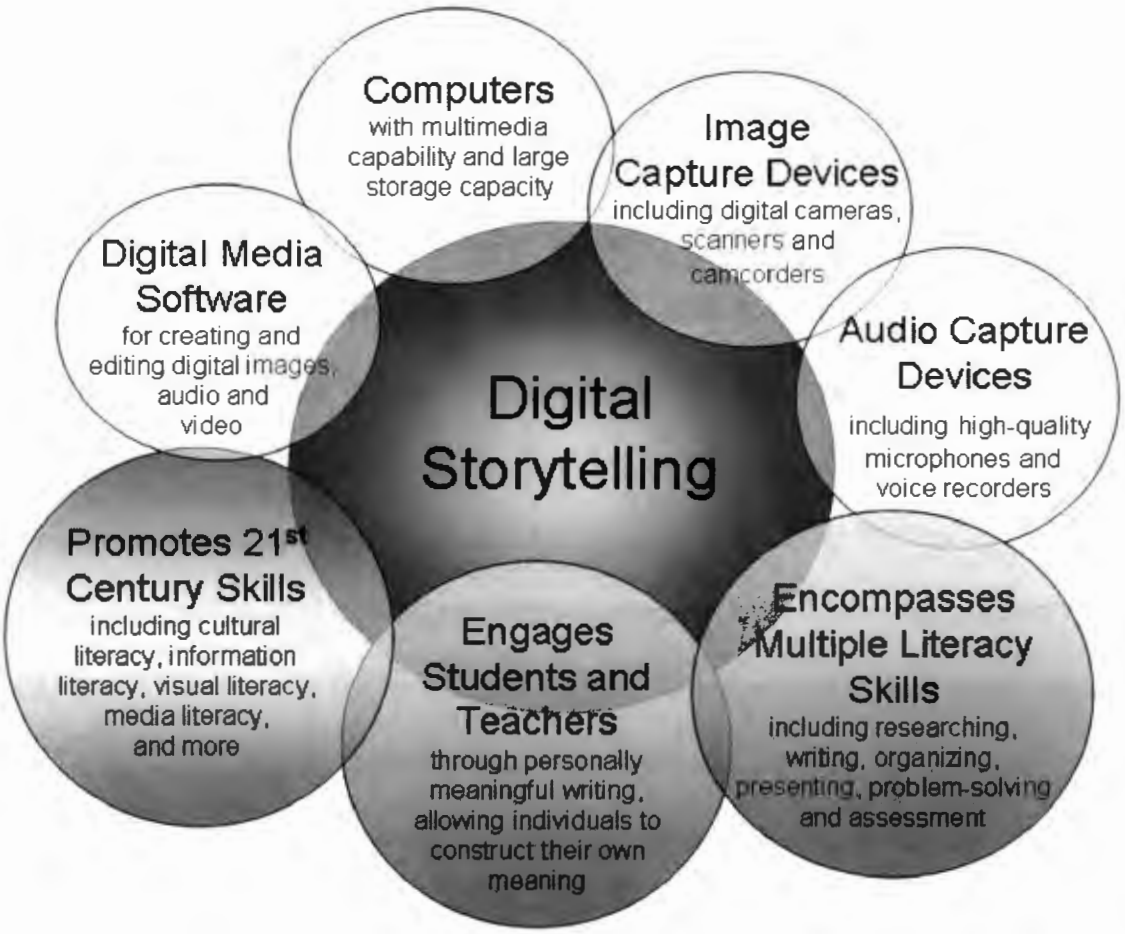

Figure 1. The convergence of digital storytelling in education. Adapted from "Digital Storytelling: A Powerful Technology Tool for the 21st Century Classroom,' by B. Robin, 2008, *Theory Into Practice*, *47*(3), 220-228.

Enhancing 21st Century Literacies

Before any discussion of the research behind how digital storytelling enhances specific literacies, a brief description of what tools and skills are used in the production of these artifacts is needed. In chapter 3 of her book *Digital Storytelling: A Guide for Educators*, Midge Frazel (2010) detailed the technical skills that students employ in the production of a digital story. These included storyboarding, image recording (camerawork), audio editing, video editing and time management. Understanding that the creation of digital narratives includes both hands-on technology skills and aesthetic judgment ability is important when exploring the 21st Century literacies that are enhanced.

Media Literacy. According to Marshall (2003), "Use of educational technologies accounts for at least 11 percent of the total variance in the basic skills achievement gain scores of fifth-grade students, as measured in a 10-year West Virginia statewide study" (p. 1). He cited the emphasis of media literacy as an important component of educational technologies, yet this is a literacy that has its roots in the 20th Century (Cuban, 1986). Activities such as digital storytelling are what make media literacy a 21st Century literacy.

When Sylvester and Greenidge (2009) conducted their case study regarding how digital storytelling extended the potential for struggling writers, they identified that when students understand the relationship between imagery and sound, they begin to understand the concept of abstract language, the progression of plot, and the need for continuity in a narrative. These concepts are key when learning the craft of writing. They are also directly transferrable to the creation of media. The

three students who were identified in the case study all showed improvement in reading and writing skills after creating digital narratives.

Digital Literacy. Digital literacy combines traditional core skills with 21st century learning requirements. Torres and Kallen (2008) believed that "Knowledge of the rules and grammar of movie production, broadcasting, and media presentation is a new powerful literacy. Today's educators and students will find it particularly valuable to be skilled in the use of digital media tools" (p. 3).

In their case study identifying literacies in a digital world, Brown, Bryan & Brown (2005) document the progress of a sixth grade student who required significant data to prepare her presentation about the 1970ands. Her work included traditional pen-and-paper media recording, but swiftly evolved into online questionnaires, email groups and digital audio recording. Her digital presentation was viewed as a success because she "accessed, manipulated, and shared information with a community of learners. As a result, she addressed content and communication simultaneously" (p. 3). In our wired society, to share what you learn is to be literate. To do so with technology is to be digitally literate.

Global Literacy. This 21st Century literacy is well defined by the advent and proliferation of the Internet. People who were, for all practical purposes, inaccessible due to distance, geography, economic limitations, or even time differences now have the realization or the potential for instantaneous communication. Through that avenue, students are now better equipped to understand issues in other cultures, with the potential to offer solutions. Those solutions often include the use of digital narratives. Skouge and Rao's (2009) case

studies included an example of how students in Hawaii were able to address the specific problems of Mellany, a handicapped student from Palau, who had difficulties with simple living arrangements. The student team in Hawaii collaborated with Mellany to create a digital narrative showing her existing living arrangement:

> Rather than simply focusing on what didn't work, the students brainstormed strategies that would make things more accessible for Mellany. Working in small groups, the students reviewed the media, discussed successes and challenges, and suggested strategies to improve Mellany's safety and quality of life. (p. 56)

This project then produced unintended positive results. Outside organizations viewed the narrative online and were able to coordinate funding, and the donation of materials and labor to make the necessary improvements to Mellany's small home (p. 57). With the production of one digital narrative, students separated by an ocean were able to see a problem, offer a solution, and see the realization of their ideas in a real-word situation (Skouge & Rao, 2009).

A necessary aspect of global literacy includes a sense of connection. Keiler's (2010) experience documented the attempts of digital narratives to re-tell a time and place far removed from her students. Her class's initial attempts at using PowerPoint presentations to document the Underground Railroad were uninspiring at best. "When we watched it, we all experienced a sense of disconnection. It was a decent product, but there was no real engagement" (p. 51). She then explored the idea of using digital narratives by accessing the Center for Digital Storytelling. She

reflected upon how her class's projects needed the use of the dramatic question that was to be answered by the end of the narrative. Her topic provided abundant information, and by the end of the project, her class had gone beyond the historical element and made a connection to the present:

> Our digital storytelling discussions have led to other connections and discussions on how advertisers use color, music, and images to sell products and how movies grab us and hold us glued to the screen ... we have already started collaborating on ways to present their topic in a manner that will move others. (p. 52)

Both researchers demonstrated that using digital narratives to reach out beyond the classroom and geopolitical borders strengthened students' global literacy.

Visual Literacy. Digital storytelling relies on imagery. Many researchers specifically refer to students discovering and improving their visual literacy through the digital narrative activity. Robin (2008) cited Jakes & Brennan's (2005) claim that improved visual literacy occurs because "using the latest technology to communicate imagery effectively is facilitated by students actively participating in the creation process of digital storytelling" (p. 224). Banaszewski (2005) connected visual literacy with the intellectual strength of "Visual-Spatial Intelligence – capacity to think in images and pictures, to visualize accurately and abstractly" (p. 18). He contends that using a digital imagery device allows the learner to capture a tangible image that comes from what they imagine, therefore demonstrating and strengthening their ability to communicate through visual cues.

Informational Literacy. The ability to find, evaluate, and synthesize information is commonly identified as a higher-order thinking skill by many researchers. According to Marshall (2009), "The use of digital video is a powerful way to motivate students, and, more important, students demonstrate higher level thinking skills when producing digital video clips" (p. 21). Hull and Katz (2006) evidenced this with their case study involving a young man who had been homeless. Through the process of building a digital narrative regarding the connection of poverty and race in his Oakland, California, neighborhood, he combined his own experiences along with the conditions of other neighborhoods similar to his in other parts of the country. He had never been to these neighborhoods, but through his research he was able to make comparisons with his own and synthesize his own conclusions regarding race and poverty.

Brown, Bryan, and Brown's (2005) case study also supported the assertion that digital narratives enhance informational literacy:

> Rebecca developed an e-mail group, transformed the oral interview into an online questionnaire, and sent her assignment through cyberspace. Within minutes, Rebecca received a response from Alabama. Data arrived at an alarming speed. To manage the information flow, Rebecca launched a spreadsheet application and entered her original pencil-and-paper data along with her electronic data. Patterns developed. Trends emerged. (p. 2)

The researchers contended that this retrieval and manipulation of data allowed Rebecca to improve and demonstrate her informational literacy.

Educational institutions have slowly but steadily incorporated these literacies into their curriculum. Sylvester and Greenidge (2009) emphatically identified digital storytelling as having the potential to showcase each of these literacies. As research on how technology strengthens these skills emerges, the more administrators and curriculum planners will value the lessons and activities that allow learners to demonstrate and master the 21st Century literacies (Sadik, 2008).

Most Commonly Identified Obstacles

Creating digital narratives is not the easiest concept to learn or teach. Many times the activity is shelved because an instructor faces obstacles to implementing such an activity. The following are the most commonly identified obstacles from the research conducted for this article.

Critics of the activity.

The use of digital media in the classroom – which includes creating digital narratives – does not always instill the appearance of academic pursuit when compared to traditional classroom activities. Porter (2009b) stated "Student work has traditionally been topical research that asked students to 'go look up and tell me back' to demonstrate being good consumers of information" (p. 15). With digital video technology, the casual observer will likely see the novelty of the tool rather than the teaching potential. Robin (2008) contended that administrators and curriculum developers had either been slow to respond to, or written off the potential of instructional technologies:

> The reality is that advocates of instructional technologies in schools have, for many years, been urging educational administrators and policymakers to change the focus from the technology itself to ways that technology can be used to bring out the very best in how teachers teach and how students learn. (p. 221)

Skouge and Rao (2009) contend that as more instructors apply technology to create meaningful lessons, administrators will take notice and design policy that allows for easier implementation of technology. As attitudes by administrators gradually shift in the direction toward recognizing and improving integration, this notion that digital media creation is a novelty will evolve to one that the creation of digital narratives promotes higher-order thinking skills.

Sylvester and Greenidge (2009) conducted a case study where they observed and interviewed approximately 100 elementary students and their teachers over the course of a school year regarding how digital storytelling helped struggling writers. These students were identified as struggling writers, and were categorized into three groups based upon the characteristics of three specific students they named Kyle, Ray and Colleen. Students who were compared to Kyle exhibited a reluctance to revise writing and did not use descriptive writing enough to make a complete narrative. Their experience with digital storytelling led to increasing revision and improving the use of description in their writing practices. Students who were compared to Ray were easily distracted and very reluctant to begin a writing task. Working with digital stories provided these students with visual cues and motivated the majority of them to stay with a project. Only a few students did

not stay focused on the project in front of them; the openness of the computer screen provided for distractions. Students compared to Coleen had creative ideas for their writing but would often omit details central to the plot development. Using a storyboard to produce a digital story helped these students include the critical details. Once students discovered how to create storyboards, the students' own writing became more fluid and less confusing because of the inclusion of critical details.

Despite the results from their project, Sylvester and Greenidge (2009) , after conducting interviews, concluded that administrators desire a curricular goal, which is counter to the student-driven experience that producing digital story provides learners. They contended that struggling writers may be motivated by new technologies or digital media because they are more literate in those areas: they demonstrate modern literacies.

> Knowing that a piece of writing will extend beyond the writer and the teacher may motivate reluctant writers to polish, clarify confusing parts, entertain, inform, or, for some, even complete a writing assignment. Recognizing most students' attraction to new technologies, creating stories of any genre using digital storytelling may be a viable solution for struggling writers. (p. 294)

By the end of the case study, the students like Ray, Kyle, and Colleen showed improvement with their writing skills. Demonstrating that struggling writers can improve their skills is a very tangible benefit that administrators can accept as increasing student achievement.

Lack of practical experience. Simply using technology in the classroom does not constitute integration. For many educators trained and educated prior to 1990, integrating technology has been difficult and time-consuming (Brown, Bryan & Brown, 2005). As the educational profession includes more digital natives in the teaching and administrative ranks, the acceptance of the use of digital media creation will become more widespread. In the meantime, classroom instructors who are not as savvy with technology will resort to either limiting technology integration to only what they know, or leaving integration to other instructors who are well versed in various technologies.

Brabec, Fisher and Pitler (2004) stated "Lesson planning should focus first on content and classroom strategies, then on ways in which technologies can enhance the lesson" (p. 11). They contended that too many times, the teacher, who feels the need to integrate, finds a technology and then attempts to force it into an objective, lesson or activity. Wenglinsky (2006) proposed that teachers who are seen as traditionalists should approach technology from a more constructivist standpoint:

> High school teachers should assume that students would use technology-based tools to address some of their learning tasks. Teachers should not think, "Aha! I will assign a [narrative] and require students to use the Internet to obtain information." Rather, teachers should assign a research paper and take for granted that students will use computers in a variety of ways to complete the assignment. (p. 32)

Recognizing that students are knowledgeable and fluent with technology will provide for a more meaningful learning experience, and give the instructor who

requires more experience with technology the chance to observe and integrate what students do to demonstrate mastery.

Sylvester and Greenidge (2009) provided an entire section of deterrents for employing digital storytelling. The major reason that they cited was teachers who have not been exposed to the medium. When they are introduced to the activity and the concepts, they are not aware of the resources and tutorials available already installed on their own computer. They also cited examples of teachers who had limited experience with the activity who exhibited a lack of confidence or competence. Oftentimes these instructors felt that they were on their own; concurrent with that sentiment was the lack of knowledge that online communities and resources were available at no cost. They acknowledged that the number of teachers who fall into these categories decreases each year.

Cost effectiveness. Educational technology skeptics generally make arguments that the hardware, software, and training needed to implement digital film lessons are too expensive. These arguments have become significantly weaker over the recent years (Chung, 2007; Kieler, 2010). Advances in technology and increasingly affordable equipment create a situation where digital storytelling is more likely to be used in the classroom. Torres and Kallen (2008) stated that as the availability of digital media increases, it becomes more important as a means for receiving, producing, sharing, and broadcasting information:

> Tools and resources that were once the exclusive property of a few are now available to many more people. Tomorrow's publishers, marketing people,

and community leaders will need to know how to use digital media to persuade others and tell new and effective stories. (p. 2)

Technology funding is now a regular separate item on school district budgets as opposed to being included in an overall building budget; this leads researchers to believe that districts are embracing the importance of technology and recognizing its availability. According to Tam (2000), digital media creation can take advantage of existing technology and invest in specific equipment such as cameras and media recorders.

Instructional Time. Any new skill to be taught in the classroom takes time for the instructor to learn. This is nothing new to teaching professionals. However, Healy (1998) contends that when it comes to learning new technologies, teachers seem to dedicate more time to learning because of the "what if" factor: what if something goes wrong, what if the students outpace what I know, or what if the project doesn't achieve the objectives. Teachers by nature generally have a plan B at the ready, and planning for an alternative takes time. Planning the alternative with technology is almost always more complicated – and therefore takes more time.

Most technologies mandated by schools are taught by individual districts at specific times and places, which inevitably means that teachers lose part of their planning time. This is often either a deterrent for educators to pursue training or promotes a negative attitude in those who receive the training. Online resources now allow for teachers to do more self-training on their own schedule. Banaszewski (2005) cites numerous tools and opportunities where teachers can learn on their own time, and customize their own learning to fit their busy schedules. He also cites

cursory data regarding improved teacher satisfaction regarding one-on-one online resources.

Digital Storytelling and Student Achievement

It makes little sense to integrate any technology into any curriculum or classroom unless it will improve student performance and achievement. Digital storytelling has a tremendous potential to address and improve higher-order thinking skills, communication skills, and skills that would be normally considered traditional Language Arts skills relating to comprehension and composition. This section will review the data from research in those particular areas.

Higher-Order Thinking Skills

Bernajean Porter (2009a), a leading proponent of digital storytelling, created a system for evaluation using Bloom's taxonomy as her basis and created eight questions tied to state standards for instructors or evaluators to use on student digital narrative projects when addressing student achievement:

1. What is the role of state content standards or learning objectives in the use of technology resources?
2. How effective is the curriculum design in aligning content with effective uses of technology resources?
3. What is the cognitive level of the learning task?
4. What is the focus of the assessment?
5. What is the demonstration of the student's learning of the topic/subject?
6. What is the craftsmanship of communication of content standards/learning objectives?

7. What value does the information/learning generated from the student work have for others?

8. What is the added value of technology use for content learning? (p. 16)

Working in conjunction with the North Central Regional Technology in Education Consortium (NCRTEC) to develop a set of scoring guides for computer-based student work, she and her colleagues set out to evaluate these guides in actual classrooms using digital storytelling as the activity.

Porter (2003) and her colleagues formed a partnership with the NCRTEC to "develop, prototype and validate a comprehensive set of scoring tools and processes for evaluating computer-based student work" (p. 15). The evaluation tools indicated 14 types of communication, and each communication had both an analytical and a holistic scoring guide. Each scoring guide had nine traits, divided into two parts: "Content Communication" and "Craftsmanship of Communication " (p. 17). After two years of development and field-testing, they subjected their evaluations to the NCRTEC's quality review. Their field-tests were conducted in different level classrooms, grades 4 through 12, in the State of Illinois. Teachers and researchers recorded observations.

What Porter (2003) and her colleagues discovered after field-testing their evaluation tools by conducting the digital activities and lessons in a classroom environment was that initial attempts received low scores "because the role of the product in the learning unit was either about having a fun and motivating culminating experience (e.g., making sugar cube pyramids) or developing a topic for learning or practicing technology skills" (p. 41). When they examined the teacher-

prepared rubrics, they observed that the most commonly evaluated items were technical elements and "token criteria, such as 'subject knowledge evident' and 'student demonstrates full knowledge'" (p. 41). While this assumed that the lower levels of Bloom's Taxonomy were being addressed, and a certain creative attempt was present, there was little evidence of analysis and evaluation. Sylvester and Greenidge (2009) supported this conclusion by stating "some may argue that using technology as a carrot to motivate students toward completion of a curricular goal is counter to student-driven experiences" (p. 294), but later acknowledged that with planning and experience, students can improve higher-order thinking skills "because they are more literate in new literacies and employ these to scaffold traditional literacy" (p. 294).

The National Council of Teachers of English (2009) stated that identifying and creating a point of view is considered a higher-order thinking skill, and is indicated as a standard on both state and national standards for Language Arts education. Perspective or a point of view is identified as one of the seven elements of digital story telling by the Center for Digital Storytelling as cited in Robin (2008a). Kieler (2010) attested from her experience that one critical thinking skill that is difficult for both young and adult learners to find is a perspective or a point of view.

Katz, Low, Stack and Tsang (2004) established a direct correlation between students' work with higher-order thinking skills in the Language Arts discipline and improved student achievement when analyzing assessments of English Language Learners (ELL). Their study was conducted in San Francisco Unified School District

(SFUSD), using the Stanford 9 and the California English Language Development Tests used in grades 2 through 12 as their data collection tool. The researchers

> ... utilized a vast amount of English proficiency, content area testing, and student background data of the 27,683 English learners of SFUSD to explore systematically the relations among content area testing scores, the students' English language proficiency, and a variety of backgrounds variables. (p.36)

The study drew test data from the 2001-2002 and 2002-2003 school years, and classroom observation data collected during the spring of 2003. Their data suggested that when ELL students succeeded with synthesizing and evaluating texts – specifically citing the use of digital storytelling activities – they evidenced success in other disciplines. Specifically, they saw improvement in students' abilities to do word problems on math and science evaluations. While this research was not specific to digital narratives, it did address the critical and higher-order thinking skills that students employ when engaging in that activity.

Communication Skills. According to Shenneman (2010), The National Council of Teachers of English (NCTE) claimed that traditional storytelling demands quality communication skills. No argument was found through research that claimed digital storytelling could be successfully accomplished without three vital specific communication skills: writing, research, and collaboration. However, in a separate survey conducted by the NCTE "Most ... respondents (62 percent) rejected the idea that basic language, reading, and writing skills must be mastered before critical 21st century literacy abilities can be cultivated" (2009). One piece of literature that reconciled these two assertions also provided a small amount of data

displaying student achievement. Sadik (2008) evidenced students who demonstrated mastery of skills specific to digital storytelling also showed improvement or mastery on reading and writing assessments. Evaluators rated student work on a five level rubric that covered 12 criteria related to composition. Their work showed that students who executed digital stories with mastery also showed improvement in areas such as point of view, organization, and content. Sadik's sample was comprised of two private Basic Education schools in Egypt; the sample was limited to eight classrooms consisting of 35-45 students ranging in age from 13 to 15. The author acknowledged that the sample was small and limited in scope, but observed that the classroom environment was engaging to nearly every student (pp. 503-4).

Traditional communication skills are continually valued by their inclusion in published state core competencies, including the State of Iowa (Iowa Department of Education, 2011). Identifying technology-driven projects that strengthen those skills such as digital storytelling is valuable, according to Sylvester and Greenidge (2009): "Creating digital stories invites students to employ old and new literacies, and through the process of creating a movie they erect, explore, and exhibit other literacies"(p. 284).

Like most Language Arts activities, digital storytelling requires cursory writing skills, but the activity also fosters an environment where they can be developed more effectively. Jakes and Brennan (2006) detailed what students learn from digital storytelling in their article. Regarding writing, they claimed "digital storytelling helps students write more effectively by permitting the visualization of

the writing, resulting in an additional level of perception that extends the writing process to a place seldom reached" (p. 4). They recommended making use of non-technology time when possible, focusing on storyboard creation and script writing. They contend that these parts of the project are good motivators for students with marginal writing skills to practice.

Pruden, Scott, Spires and Lester (2011) constructed a study to discover how *Narrative Theatre*, a narrative-centered learning environment that uses digital storytelling, impacted writing achievement. "Four participants were chosen for the qualitative case studies using a purposive sampling process from the same group of students as in the qualitative study" (p. 3816). Teacher recommendations were used to identify the participants, using three criteria: (a) students who were willing and able to offer information about themselves and their writing, (b) students who struggled with writing, (c) students who were sixth grade males from varying ethnicities. The participants all identified themselves as weak writers in school, but good writers when writing independently. Their study focused on how interaction with an intelligent narrative-centered learning environment impacted sixth-grade students' self-efficacy for writing skills. All four students were led through the exercises via a guided-voice tutorial in the *Narrative Theater* environment. Each student worked on projects independently, assisted only when requested. Their results showed that students demonstrated significantly higher levels of self-efficacy after interaction in this environment. This qualitative study showed that the students were motivated to use the media function of the program that allowed their stories to become more than just a simple narrative. All four students showed

improvement in organizational and planning skills and demonstrated high levels of engagement in writing production.

Sylvester and Greenidge (2009) hypothesized that writing assessments did not identify the deficiencies of poor writers, and compounded the problems of those who may have some specific strengths in writing with the element of time pressure:

> Understandably assigning everyone the same topic and imposing time constraints is an attempt to assess students' writing achievement by giving all students at specified grade levels the same prompts and then comparing them with anchor papers; yet, for many who may already be intimidated in this discipline, timed prompt writing further promotes their feelings of incompetence. (p. 286)

They conceded that it is likely future tools for student assessment will not address the elements of digital storytelling that promote writing skills, but they asserted that promoting digital narratives as a classroom activity would likely give struggling writers the confidence and skills to improve. "Giving students an environment in which interaction and collaboration are encouraged help them write more productively" (p. 292).

Research Skills. From her study to assist Egyptian teachers in developing teaching and learning through the application of digital storytelling, Sadik (2008) found that the first step for preparing a digital narrative was to "define, collect and decide" (p. 495). She continued:

> Learners need to search for image resources for the story, including: pictures, drawings, photographs, maps, charts, etc. ... locate audio resources

> such as music, speeches, interviews, and sound effects ... find informational content, which might come from web sites, word processed documents, or PowerPoint slides. (p. 495)

Out of this qualitative study, Sadik observed that the vast majority of the forty students in this secondary school spent more time on research than teachers had planned, which resulted in an unexpected positive outcome from the activity. Interviews with both teachers and students confirmed that the activity was both motivating and created opportunities to find more information than what was required. The small sample allowed every teacher who participated in the study to evaluate every project that students created. Teacher evaluators examined all stories using a standard rubric. Results from these evaluations provided evidence that 1) the students were able to identify and meet the research and writing criteria for the project at a satisfactory level, and 2) that all teachers in the study were consistent with their evaluations. Sadik recorded over 80% of the students in the study completed their projects on time, despite spending more time on research. This was interpreted as students realizing the value of meaningful research.

Research can lead to more meaningful synthesis. Hull and Katz (2006) concluded from their case studies that students engaged in researching information, locations, and supporting media made them evaluate the quality of the information more closely as the project progressed (pp. 56-59). Behmer (2005) cited research that showed how students strengthened their understanding of the Holocaust. Their understanding of the historical events led to interviews of people who lived through the event, gaining information unavailable in a textbook.

Brabec, Fisher and Pitler (2004) identified summarizing and notetaking as a form of research and learning strategy that technology supports in a positive fashion. "Summarizing requires students to analyze information at a fairly deep level, thus strengthening their understanding" (p. 7). Research for digital storytelling is as varied as the students that create them. The skill of summarizing can be done a variety of ways, but still requires all students to look carefully at what they uncover. Web resources are now the preferred research avenue, and with the consistent reliability and improvement of sources such as Wikipedia, Internet research becomes more accessible and widely used.

Learners take on the mantle of producers, designers, playwrights, and authors when they construct a digital story. Torres (2008) found that in the process of assuming these roles, they oftentimes researched what those roles entailed, and searched for examples or models of those professional roles. He summarized that by students emulating positive role models and following their advice, the pursuit of research became more meaningful, and results in a superior final product.

Frazel (2010) insisted that any preparation is considered research, as planning requires deeper thinking about what the project is destined to look like. She used the concepts of scripting and storyboarding as precursors to research. These two activities, usually combined for a single project, allow the creators to envision what they want, and plot a course not only for production, but also as a guide for research as well. Chapter 2 of the book was devoted to planning tools and options for executing the preparation aspects of digital narratives.

Collaboration. The composition of a digital story is most successfully accomplished in small groups, and therefore requires collaboration between learners. Sadik (2008) wrote "Constructivist strategies include collaborative and cooperative learning methods, engaging in critical and reflective thinking and evaluation through electronic portfolios" (p. 489). Technology plays a vital role in any constructivist strategy; Wenglinsky (2006) contended that even simple technology tools such as email that allow for an exchange of information provide the opportunity for meaningful collaboration. Based on a questionnaire used by the National Assessment of Educational Progress (NAEP), Wenglinsky cautioned that teachers should not assume that all students have the sufficient skill to use technology that could lead to meaningful collaboration.

Students who have difficulty with creating original or focused narrative strands tend to thrive when creating digital narratives because of the collaborative nature. "The multimedia used to create a digital story promotes active learning and collaboration: two approaches to learning that help distracted students stay engaged with the assignment" (Sylvester & Greenidge, 2009, p. 292). This engagement is essential to continue learning on more advanced levels. Manning's (2009) case study concerning students with learning disabilities studied how recording and presenting of oral histories allowed students who traditionally struggled with a variety of skills flourished in the more collaborative environment of producing digital narratives. One of her conclusions was that the collaboration brought a collective strength to the project. "Residents' testimony was thought provoking, insightful and entertaining. Their involvement in the project highlighted

residents' willingness and ability to exercise certain powers within [their community] as well as the oral history and digital history paradigms" (p. 166).

No evidence or research exists to suggest that online communication has an advantage or disadvantage over face-to-face collaboration. Sadik (2008) described the online collaboration from her students when they were not in the classroom and Skouge and Rao (2009) documented that their students worked extensively online with the subject of their project (p. 58). Sylvester and Greenidge (2009) mentioned one-on-one collaboration with one subject of their case study, and a small group effort by another subject. Nowhere in either of these case studies did the researchers claim that another form of collaboration would have been better. The remainder of the research made no assertions regarding the quality of collaboration.

Conclusions and Recommendations

Why is it important to be able to identify the 21st Century literacies? According to the collected research, 21st Century literacies are cross-curricular, allowing for learners to build multiple skills in any subject area (Porter, 2009b; Skouge & Rao, 2009). All require significant instruction focusing upon or using existing and emerging technologies. Digital storytelling demands skills that require learners to use technology to improve learning; communication skills to discuss and seek help; to respond to peers from a more global perspective; communicate through visual images; and seek, evaluate and synthesize information (Brown, Bryan, & Brown, 2005; Kieler, 2010; Robin, 2008; Sadik, 2008; Sylvester & Greenidge, 2009).

If educators wish to implement the use of digital storytelling as a learning tool, then it is important they have knowledge of the 21st Century literacies.

Administrators who can identify these literacies will be able to provide more frequent and better quality professional development for their faculty (Sylvester and Greenidge, 2009). These opportunities are just one of many tools that would introduce those literacies to educators. Peer-to-peer workshops would also be an extension of those development opportunities. Teachers who need instruction regarding digital storytelling will find a wealth of information through online resources, traditional print media, and live seminar presentations by experts cited in this paper.. To best answer what the 21st Century literacies are, instructors need to integrate them into their own preparation and instruction.

Why is it important to be able to clearly define digital storytelling? Knowing the elements of what comprises this activity provides learners and instructors with tools to improve writing and communication. Teachers who wish to integrate digital storytelling into their classrooms must prepare for the activity in two major areas: 1) they need to plan meaningful lessons that will allow the integration of technology to help engage learners instead of planning how to integrate technology into lessons that may not benefit from the infusion, and 2) they need to learn and practice with the technology to be integrated, and keep their training updated (Frazel, 2010; Robin, 2008a; Sylvester & Greenidge, 2009). Learning technology takes time, but the nature of teaching is that *any* training takes time. Given the nature of education, and the embracing of technology at so many levels in education, even the smallest of schools requires knowledgeable teachers who are adept at using technology. "As educators ... we will continue to use emerging technologies to model for our students" (Skouge & Rao, 2009, p. 59).

What obstacles to implementing digital storytelling exist, and how can they be overcome? No obstacle identified is insurmountable, and as time passes, it is likely that they will be conquered. Cost will likely always be a factor, but justifying the expenses can and should be made with conviction and with research in hand (Torres & Kallen, 2008; Porter, 2009a). Training is ultimately up to the individual who wishes to implement digital narratives into their curriculum; with the wealth of resources that are available online and within school districts and communities, few justifiable reasons exist for teachers to pass training opportunities on to others. It can't be said with certainty that there will always be critics of the digital storytelling activity, but it's likely that some justification will be needed if the validity of the lesson is questioned. Case studies that document actual student projects and their successes are the best illustrations to convince the skeptical observers (Brown, Bryant & Brown, 2005; Hull & Katz, 2006; Skouge & Rao, 2009; Sylvester & Greenidge, 2009).

How does digital storytelling increase student achievement? Digital storytelling motivates and actively engages students in learning and building upon communication skills (Brown, Bryan, & Brown, 2005). Visual learners do not always succeed with traditional pen-and-paper projects. Using digital storytelling in the classroom with learners who struggle with writing to express understanding is a viable form to evaluate newly acquired skills. Creating digital narratives helps visual learners apply information literacy skills in new and creative ways. Researching visual images, archived films, time lines, and other visual media employs the same skills as traditional research methods. Collaborating with peers creates an engaging

learning environment for the individual learner. Face-to-face and online communication can be merged to allow students to actively seek peer input where they may not have before (Robin, 2008; Sadik, 2008).

Recommendations

The variety of student-generated digital videos present educators with nearly endless possibilities for creating meaningful instruction. It can also provide administrators and curriculum developers with more planning options to realize student achievement within identified core-skill areas. While research on digital storytelling is extensive, more is needed for how students create and use digital stories to build upon the skills that they will require. Researchers and educators can only hypothesize what technologies will be available for students in the future, but it appears likely that the identified 21st Century literacies will be viable for many years; therefore, understanding how students can master these skills is essential for developing meaningful learning opportunities.

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