

A Multilevel Approach to Using Digital Storytelling in the Classroom

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Abstract: Digital photography and Digital Storytelling have been combined at the University of Houston's College of Education in a manner that allows both undergraduate and graduate students to learn not only how to use digital cameras and imaging techniques, but also to create compelling digital stories. Our students have progressed beyond learning the technical skills that were originally envisioned by instructors to seeking ways to integrate digital cameras into the curriculum. An examination of how graduate students in the Instructional Technology Program and undergraduate teacher education students are visioning, designing and creating digital stories is presented and discussed.

Introduction

During the past ten years, much of the interest in information technology has centered on the Internet and the World Wide Web. Educational institutions have made tremendous strides in acquiring the computer hardware and infrastructure necessary for every student, teacher and classroom to access the vast resources of the Web and they have achieved unprecedented success in this area. But the explosion of digital photography and its associated technologies have finally taken hold in such a widespread fashion, that access to digital recording tools is quickly becoming as ubiquitous as the classroom computer or the long sought after Internet connection. In fact, a national dialogue is currently underway in which educators and educational policymakers are exploring ways that digital images can be used in the curriculum (Bull & Thompson, 2004). These educational leaders are thoughtfully discussing how instructional activities might be created and disseminated to take advantage of the digital imaging revolution that many are calling the next ubiquitous technology (Rivard, 2004). At the University of Houston, our faculty and students are seeking ways that digital imaging and photography can extend beyond the more customary *how these technologies work* to *how these technologies can be used to expand the role of teachers and learners*.

Digital Camera Resources for Graduate Students

In 2004, a University of Houston grant allowed the College of Education to acquire a set of high-quality Canon Digital Rebel cameras. These high-end digital single-lens reflex (DSLR) cameras are more flexible than many point-and-shoot digital cameras and give photographers more creative control than is possible with less sophisticated digital cameras. Some of the major features of these cameras are 1) they allow for the use of interchangeable lenses to better suit the type of object being photographed; 2) they allow the photographer to override the camera's automatic settings to take pictures under unusual conditions, such as low light or fast-moving action; 3) the cameras can be used with a wide assortment of accessories, such as supplemental flash units, external lighting kits, macro-lens attachments, and remote controllers; and 4) perhaps, most importantly, the capabilities of these cameras challenge the students to think about creating images more creatively and in more visually interesting ways.

Design of an IT Graduate Course in Digital Photography

The acquisition of these cameras was used as the impetus to develop a course that would be offered to graduate students in the College of Education's Instructional Technology Program, in which they would first learn to use the cameras and then explore ways that digital photography could be used in both K-12 and higher education classrooms. One significant advantage of the grant award was that we had enough cameras so that each student enrolled in the course was able to check-out and use one for the entire semester. This was a first for our IT Program, in that never before had the same piece of high-end equipment been available for every student in a technology-intensive graduate course. This condition allowed the course to be designed in a unique manner where every student began basically at the same level and with access to the same resources.

An Emerging Focus on Digital Storytelling

In addition to becoming comfortable taking pictures with a digital SLR camera, students were also introduced to the art of telling digital stories with their images. There are many different definitions of "digital storytelling," but in general, they all revolve around the idea of combining the longstanding art of telling stories with any of a variety of "available multimedia tools, (such as) graphics, audio, video, animation, and Web publishing" (Mellon, 1999). Meadows (2003) defines digital stories as "short, personal multimedia tales told from the heart." The strength of this form of digital expression, he maintains, is that digital stories can be created by people everywhere, on any subject, and shared electronically all over the world. Meadows goes on to describe digital stories as "multimedia sonnets from the people" in which "photographs discover the talkies, and the stories told assemble in the ether as pieces of a jigsaw puzzle, a gaggle of invisible histories which, when viewed together, tell the bigger story of our time, the story that defines who we are." In our course, we begin our exploration by examining digital stories that are available online, to investigate what others have done in this area and help shape our own ideas and plans. A few of the resources we use to introduce students to Digital Storytelling are shown in Figure 1.



[From Peru to California](#)

(J. Alarcon & S. Hall, 2004)

is one of a series of Digital Stories created by high school students that shows how and why individuals or families migrated to California.



[Scissors](#)

(D. Meadows, 2002)

is one of several digital stories created by Daniel Meadows about his family in England during the period surrounding the Second World War.



[The Look](#)

(C. Jacobson, 2001)

is a personal narrative that describes a passion for science fiction and presents a historical perspective that many may not have heard before.

Figure 1. Examples of digital stories published on the Web

We use these examples to demonstrate to our students how storytelling can be used as a mode of communication and personal reflection and ask them to create mini-documentaries and essays from their own perspectives. In so doing, they quickly begin to learn how to master the Canon digital cameras and imaging software and become exposed to newer and more sophisticated capabilities of these tools.

Our first graduate course on Digital Photography included a final semester project where students selected an historical or cultural topic related to Houston or other nearby areas in Texas. The students follow the process that Meadows describes by first selecting a topic that they feel can become an interesting digital story. The emphasis of this digital story project is on taking and using still images. Although many of our graduate students are either already familiar with digital video tools or they are interested in gaining this expertise, they are asked to see what

they can create using just still images, without adding video components to their projects or by using just an occasional video clip or two. This makes sense given the fact that we offer a separate course related to digital video and the digital photography course is a prerequisite for that second course.

Over several weeks of the semester, the students use the digital still cameras to take numerous photographs that visually describe different aspects of that topic and conduct additional research, perhaps by interviewing people who have knowledge of the topic and searching for supplemental materials that can add additional information and insight into the story they want to tell. Once the raw materials for the story are gathered, the students begin writing a script, recording the narrative, and editing their stories on a computer, putting everything together into a rough-draft version of their story. Then, as a group the class members view the almost completed projects and make suggestions for improvement. In the last part of the process, the digital stories are uploaded on the Web and shared with others interested in viewing the completed projects.

Topics that students selected during the first offering of the course include Houston's Chinatown, Religious Diversity in Houston, Houston's Heritage Park, Historic Galveston, and Cultural Diversity of Students at the University of Houston. The specific requirements of the final project's digital story are based on The Center for Digital Storytelling's Seven Elements for Digital Stories (Center for Digital Storytelling, 2004), which include such items as: Point of View, Dramatic Question, Emotional Content, and Economy and Pacing. These elements have been expanded and modified, as shown below, to make them more applicable to the cultural and historical categories the graduate students explore in the University of Houston course. The modified elements are shown in Table 1.

1. The Overall Purpose of the Story	6. Pacing of the Narrative
2. The Narrator's Point of View	7. Use of a Meaningful Audio Soundtrack
3. A Dramatic Question or Questions	8. Quality of the Images
4. The Choice of Content	9. Economy of the Story Detail
5. Clarity of Voice	10. Good Grammar and Language Usage

Table 1. Expanded and modified digital storytelling elements

This modified set of elements provides students with a clear purpose and set of guidelines which they use as they take pictures on their topic, prepare a storyboard of their ideas, and ultimately, complete a compelling, interesting and insightful digital story that demonstrates their understanding and point of view of their chosen topic. Examples of the Digital Stories may be viewed online at: <http://www.coe.uh.edu/digital-storytelling/>



[Coming to Houston](#)

(S. Kang, 2004)

describes the journey of several of the University of Houston's international students and what they have found since arriving



[A History of Galveston](#)

(J. Lazzaro, 2004)

presents an historical overview of Galveston, Texas, including archival footage of the 1900 hurricane that hit the island



[I Remember](#)

(T. Rapp, 2004)

tells the story of Sam Houston Park, an historical landmark that is located in the downtown area of the fourth largest city in the United States

Figure 2. Examples of digital stories created by IT graduate students

The Digital Storytelling Experience in Preparing Teachers

Need for an Integrated Project

Digital storytelling has also proven to be the solution to our search for a rich technology-integrated teaching and learning model for our undergraduate teacher education students. A key goal of our teacher education program is

that our graduates be able to meaningfully use technology to support their curriculum beyond basic productivity tasks; thus, we encourage our students to think beyond the technology tools themselves to educationally-sound uses of those tools. The first undergraduate course in which digital storytelling was introduced is the second in a three-course Technology in the Classroom sequence. Students enter the course with a functional knowledge of most productivity and communication tools and are charged in this course with using those base skills to strengthen elementary and middle school curriculum. In previous semesters, our future teachers dutifully created lesson plans with related activities aligned to state and national technology standards, yet despite our focus on curriculum connections, the technology use in these lessons seemed forced and largely additive, rather than integrated. Through the Digital Storytelling process, we have attempted to demonstrate how much more powerful technology can be when it is used to support compelling, authentic content.

Project Requirements

Prior to having students design and develop their own digital stories, we began by showing them countless examples of digital storytelling for educational purposes. This strategy of “vision before application” is one we have found to be consistently successful in giving students multiple practical ideas of what is possible in teaching with technology before they lay hands on the software. Past methods of teaching the tool first without establishing the vision resulted in technically sufficient, but educationally weak products.

The story examples were explored according to a framework of lesson events: digital stories that could be used as anticipatory sets; as the main content presentation; as lesson closure; and most intriguingly, as examples of what future elementary and middle level students might create to demonstrate their mastery of content and concepts. Upon initial viewing, these future teachers watched each example attentively enough, yet with only a surface-level interest, as one would watch a commercial on television. However subsequent discussions probing the elements, meaning, purpose, and audience of these stories truly seemed to wake students up to the possibilities of digital stories for teaching and learning. We debated elements and characteristics that lent themselves to stories used for these various lesson purposes (e.g., shorter stories with flashier transitions might grab students’ attention best during the anticipatory set whereas simple images with little text might facilitate a good unit review discussion). Their early reticence to engage in these stories gave way through our deeper discussions to a sense that they not only understood the meaning the stories might have for their future students, but also a budding confidence that they, too, might be able to create such moving messages themselves.

Undergraduate students in our courses were asked to create digital stories in support of a technology-integrated unit they were developing. These units were required to tackle a real-world problem that would affect the intended level of students, either a topic on a large-scale, such as pollution or world hunger, or something of local importance, like the possible uses of a vacant lot near a neighborhood school. Units of a general nature were discouraged with the mindset that technology use is significantly more powerful when used to assist students grappling with authentic challenges. Thus, the digital stories were used to strengthen already strong content.

Specifically, students had the option of creating either a teacher tool, a digital story-presentation that they would use themselves to convey content, grab student attention, or create a sense of context; or creating an example of a student presentation, a model they could use to demonstrate to their future students convincing ways to share their learning or perspectives. The products were developed and assessed according to the criteria derived from the previously mentioned Seven Elements for Digital Stories (Center for Digital Storytelling, 2004). Students were required to integrate multiple technology components into a single cohesive story. Unlike the situation with our graduate students who were asked to limit their stories to static images, the undergraduates were free to use either still images, video clips, or any combination of the two. Armed with these criteria, we led students through a process of planning and storyboarding before opening up a slate of tools. Next, students created or located their media elements. Many attempted to record their own files using digital still and video cameras, as well as experimenting with other recording and productivity tools such as handhelds, tablet computers, Alphasmart keyboards, digital microscopes, and digital audio recorders. Finally, most of the students supplemented their original work by locating digital images and sound files from online sources.

Once the digital elements were saved and organized, students had the option to use Movie Maker for Windows, iMovie for the Macintosh, or PowerPoint, for either platform. PowerPoint was an easy option for some, having been introduced to the software the previous semester, however most were intrigued with the features of the more specific video editing software. The advanced instruction on these tools was minimal; students began with their storyboarded

plans and quite intuitively progressed at their own speed. End products ranged from one to four minutes and included still pictures, video, narration, music, sound effects, and written text .



Community Helpers

(A. Ibarra & I. Medellin, 2004)
presents a variety of careers that help us in a slow timed format that allows primary students to discuss their attributes.



Recycling

(L. Stewart, 2004)
uses powerful images and music depicting to elementary students what our planet looks like when we do not take care of it.



The Journey to Independence

(C. Boates, 2004)
presents an overview of facts and images to be used as an anticipatory set for a unit on Texas History aimed at middle level students.

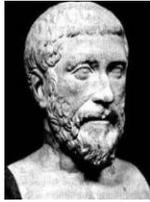
Figure 3. Examples of digital stories created by preservice teachers

Student Impressions

When these future teachers understood that they were being asked to create digital movies, most were uneasy and unclear about how to proceed. At the conclusion of the semester, the students overwhelmingly commented on how much easier it was to create the digital stories than they had expected. They were excited that the tools used were so user-friendly, and a number described feeling powerful in their ability to plan and develop their stories. There was much excitement at the prospect of using these tools with their future students.

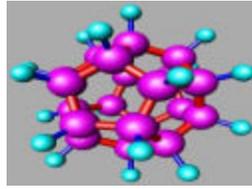
Digital Storytelling and Inservice Teachers

Our entry into the world of digital storytelling also includes working with practicing teachers in Texas public schools. A series of workshops on digital storytelling, funded by a US Department of Education grant, was presented to a group of high school teachers in Brownsville, Texas during the end of 2004 and the beginning of 2005. The teachers were interested in learning to use technology in the classroom to promote project-based information-gathering, personal reflection, and authentic problem-solving. One unexpected result of the initial workshop was that the mathematics and science teachers found ways to use digital storytelling to create stories that would interest their students in exploring topics in these areas. We had assumed (incorrectly, it turned out) that that it would be more difficult to interest math and science teachers in using digital stories in their content areas, than the more visually-oriented areas such as history, writing and the arts. However, we have come to believe that digital storytelling may indeed be an appropriate tool for any content area, and that creative teachers can easily find ways to use digital storytelling to support their curricular needs. A few of the initial digital stories the mathematics and science teachers created are described in Figure 4, below.



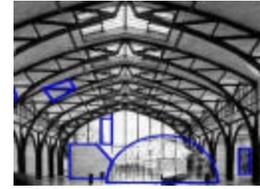
[A Glance at the History of Mathematics](#)

(Lopez High School, 2004)
presents an overview of how mathematics has been used throughout history, including an interesting look at the Pythagorean Theorem.



[Small Beginnings](#)

(Lopez High School, 2004)
is a simple, yet elegant visual journey of that examines the history of life on earth and highlights the importance of the “small beginnings” of early life on the developing planet.



[The Use of Math in Architecture](#)

(Lopez High School, 2004)
explores how arcs are found in both natural and man-made structures and specifically how mathematical equations are responsible for much of what we see and live with everyday.

Figure 4. Examples of digital stories created by public school teachers

Perhaps one of the most unanticipated outcomes following the teacher workshop was how quickly their students began creating their own digital stories. Many of the stories that students made are highly personal and filled with emotional accounts of family events and struggles. The teachers told us that their students used digital stories to deal with the grief of losing a parent or the anxiety of going to live with other relatives. In several cases, the students reported that the stories allowed them to give voice to their sadness and helped provide closure to deeply emotional issues in their lives. In addition, special education students were able to use software to create digital stories that far exceeded the expectations of teachers and parents. Digital storytelling has become very popular at this school and as new groups of students begin seeing the stories that their peers have created, they too want to become involved, even outside of class. One group of students has begun creating a digital story of life at school and hope to make a CD-ROM version available for all interested students, much the way a printed yearbook is available. A few examples of student stories are described in Figure 5.



[The Story of My Family](#)
(A. Moran, 2004)

allows a student to use family pictures to talk about her life following the death of her father.



[Going to the Mall](#)
(Lopez High School, 2004)

describes a trip that special education students made to the mall where they learned life skills.



[Our Wedding](#)
(G. Infante, Jr., 2004)

tells the story of the marriage of a student’s parents more than twenty years ago.

Figure 5. Examples of digital stories created by public school students

These stories are relatively simple and will benefit from additional work and planning. In the words of Ormiston (in Standley, 2003), “Without a structure, students will focus on adding images, music and other elements instead of focusing on the content and organization.” This is exactly what we have seen so far, but agree with Ormiston that when teachers begin stressing planning, research and organization, the quality of the digital stories will improve. Additionally, when students learn that their stories are being uploaded on educational websites, and will be available to students throughout the world, the quality of their work will undoubtedly increase. We also hope that these humble beginnings will motivate both students and teachers to explore new ways that they can collaborate with other schools and begin forming new learning communities of digital storytellers.

Digital Storytelling Tools

A variety of different software applications are available that can be used in the creation of digital stories. Rusche (2000), whose emphasis was on using video to create digital stories, compared different programs and concluded that Macromedia Flash and Adobe Premiere were his two software programs of choice. However, Rusche's focus was on digital storytelling in the entertainment industry, not in education. Certainly, these two high-end, not to mention, expensive software programs are suitable for developing Digital Stories for classroom use, there are many other less expensive, and more user-friendly applications that educators and their students can use to create high-quality Digital Stories.

Many such software options may be obtained for free or for a relatively inexpensive cost, while several excellent tools come integrated into popular computer operating systems and may already be available to those with access to a current model Windows PC or Apple Macintosh. The table below highlights some of the software programs we recommend for getting g started with digital storytelling.

Software Program	Use	Platform	Cost
Microsoft Photo Story 3	Create digital stories from still images and audio	Windows Only	Free (but requires Windows XP)
Windows Movie Maker	Create digital stories from still images and video clips plus audio	Windows Only	Free (with Windows Operating System)
Apple iMovie	Create digital stories from still images and video clips plus audio	OS X for Apple Macintosh Only	Free (with Apple OS X Operating System)
Adobe Photo Shop Elements	Modify images used in digital stories	Apple Macintosh and Windows	between \$30 and \$59 per copy for educators
Goldwave	Audio recording and editing	Windows Only	Free version available; \$45 for full version

Table 2. Overview of popular software applications useful for digital storytelling

Next Steps

Digital storytelling has captured the imagination of both students and instructors in our College of Education and beyond. The acquisition of high-quality cameras and associated imaging tools has certainly motivated students to learn the technical aspect of digital imaging. But it is the act of crafting meaningful stories that has elevated this experience for students, teachers and faculty. Digital storytelling clearly demonstrates the whole as greater than the sum of its parts. So successful was our first digital storytelling project in proving to the undergraduate future teachers that they have a voice and moreover that they are capable of producing sophisticated multimedia productions, that it will become a more central, unifying project in future semesters. We expect to see even greater results as the technology tools become more available and more powerful, and additional digital stories and resources will be added to our website (<http://www.coe.uh.edu/digital-storytelling/>). Digital storytelling has been a great success for all of us: our undergraduate and graduate students; the teachers we work with and their students; our faculty colleagues and ourselves. As we continue with this endeavor, we will certainly expand our understanding of digital storytelling and its multilevel capabilities in many different classroom settings.

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