

THE DIGITAL STORY: DESIGNING PROFESSIONAL DEVELOPMENT IN TECHNOLOGY INTEGRATION FOR K-12 TEACHERS

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School leadership and teachers expressed a need for technology integration in classroom instruction. The teachers targeted in this design were local high school teachers of one South Florida high school. A systems design method with grounding in activity theory was employed to design the original lesson, but adult learning theory was overlooked in this early design process. Additionally, the main goal of the lesson was sacrificed to accommodate time constraints, and some of the images provided to complete the lesson contained the wrong aspect ratio. Adults require “self-direction,” and the original lesson design afforded the participating adults little control over the construction of their digital story. These shortcomings resulted in a need for a redesign of the lesson into three lessons. A series of three professional development lessons were produced to instruct teachers to create their own content-specific digital stories for use in classroom instruction. The final product became a series of three print-based lessons, and will be distributed as professional development to teachers.

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THE DESIGN CONTEXT

This design case includes the thought processes associated with selecting the goals of a specific technology lesson, along with the development decisions, formal evaluation of the original lesson, and the decision to expand the lesson and change the lesson format.

During the design process, I worked as a science teacher at a high school in southern Florida, and taught courses in Biology, and Earth/Space Science. I originally designed a digital story lesson to instruct classroom teachers at this high school how to construct their own content-specific digital stories. School administration had expressed concern over the lack of technology integration in the school's classroom lessons, and during a discussion with several faculty members, an administrator mentioned that it would be beneficial if someone from the faculty would help in preparing a professional development activity to address this concern. I decided to take on the task, and selected the lesson goals after discussing the needs of the school with an informal planning team that consisted of several administrators and teachers.

The U.S. Department of Education stresses technology integration for classroom learning (ISTE, 2008; U.S. Department of Education, 2010), but teachers in Florida have limited time available for professional development. Additionally, during the process of this lesson design, the state of Florida was undergoing rapid changes in accountability requirements for educators. Florida's testing requirements were a priority for all school personnel, therefore the initial planning team was only available for informal discussions. School leadership welcomed teachers to volunteer for assistance with technology integration and different professional development needs. The informal planning team discussed a wide range of lesson possibilities, including: web design basics, school portal usage, digital stories, and wikis. Originally I thought that a lesson on digital storytelling would fit the short afternoon time frame given for professional development during designated early release days. I had worked with all four of the suggested topics and had personally found digital storytelling simpler than the other three. Therefore, I selected

digital stories as the lesson that I would design, while several other teachers committed to other technology-based professional development lesson designs. As part of this planning meeting, a group of teachers agreed to participate in the formal evaluation of the original lesson design for digital storytelling.

DESIGN PROCESS

I began to search for a theory or theories to use for my design analysis. I wanted the teachers to learn by creating something useful for their classrooms. According to Jonassen, Tessmer, and Hannum (1999), the activity system is the focal point of the design analysis used in activity theory. The components of an activity system include the object, community, tools, rules, and roles. In this design, the object was a content-specific digital story. The final instructional design instructs the learner to transform this object by learning to produce a digital story through the use of a common software tool. This transformation occurs when a teacher learns to produce a content-specific digital story using the computer software specified in the designed lessons. Teachers learn by actively manipulating computer storytelling software and using the software tool to create a short video for their classroom as an educational tool.

Understanding the culture and history of the learner is also beneficial in activity theory task analysis (Jonassen et al., 1999). Therefore, after defining the object, an analysis of the activity system required an analysis of the subject and community. In this learning context, professional development periods took place during early release days. These early release days were scheduled once monthly; students were released close to noon, and teachers were required to report to designated professional development sessions after lunch. These professional development sessions last approximately one hour and twenty minutes. Teachers at this school were already working at a fast pace due to the state of Florida's high-stake assessments and curriculum pacing guides, and many teachers were required to follow these pacing guides in a strict manner. Therefore, it was thought that the original lesson had to be simple, short, and engaging in order to capture the attention of teachers that already had many responsibilities.

Selecting the Topic

I originally selected a short, simple science lesson on first, second, and third class levers. I felt it was necessary to make a content-based lesson and this lesson was easy for me to construct. After all, I was a science teacher and therefore, knew these concepts well. There were time constraints, but selecting a content-based lesson that was not universal to all subject areas did not match the original lesson goals with the proper activity theory based outcome. In retrospect, various images for different content lessons would have

been a better design as a generic lesson, by its very nature, was not content specific. Including a large variety of images would have allowed teachers of different content areas the ability to select and construct a digital story for their own classrooms. Ending a professional development session with a product they could immediately use could increase the teachers' feelings of success and ownership. This could have led to increased motivation to learn and use of the technology for classroom instruction. Yet, amassing that number of images would be a very difficult and time-consuming task, and did not fit into my original conception of the activity theory-based lesson.

During the design process, in March 2011, the Florida Senate passed a law that would include student scores on the Florida Comprehensive Assessment Test (FCAT) as a criterion for evaluating performance pay. In addition, another state law, SB 0736, also required assessments in all subjects by the 2014/2015 school year (The Florida Senate, 2011). As the lesson design progressed through its different stages of development, the state of Florida's assessment requirements became even more demanding. Compliance with these required assessments was taking up more professional development time (Florida Department of Education, n.d.; Versteeg, 2010), and even before the original lesson reached the redesign stage the professional development time available for teachers was beginning to be redirected toward an almost absolute focus on testing.

During this period of time, an outside accreditation team suggested a need for more technology and technology integration in the classrooms. Therefore, the need for the professional development continued, but there came the realization that some teachers had limited availability of in-class technology. There were now two limiting factors: limited technology and time. Some teachers did have the requisite technology; therefore, administrators were still interested in developing the professional development lessons. Nevertheless, creativity was needed to plan a more flexible lesson delivery mode than was present in the original digital story lesson. It was important for the updated design to provide teachers with a lesson that allowed them to make their own individual content-specific digital story. These limiting factors and the resulting changes to the design informed the evolution from the original lesson to the final stand-alone lesson design.

I decided on a final redesign of the lesson in the form of multiple stand-alone Microsoft Word documents. In this format, these lessons could be distributed to individual teachers for self-directed learning or used as paper-based lessons for group learning if time became available. Additionally, the teachers would learn how to gather their appropriate and copyright-friendly images while also learning to edit them.

DESCRIPTION OF THE DESIGN

The description of the design begins with the creation of the single original lesson and documents the revisions leading to the final design, comprising three lessons. This description includes: the details of the original lesson design, the theory selected to inform the design flow, the design evaluation, and the necessary redesign due to the evaluation.

The original lesson design included a short digital story presentation, a written step-by-step manuscript with illustrated Print Screens, a sample storyboard, a blank storyboard, and a computer preloaded with Microsoft Photo Story 3 software. Sheneman (2010) surveyed librarians and found that Microsoft Photo Story 3 was considered the easiest free software to use when creating digital stories, and that it produced a portable product. Therefore, the digital story professional development lesson and the subsequently redesigned three lessons focused on creating a digital story using this software.

All of the computers used for professional development had two desktop folders preloaded with a variety of selected pictures and music files sufficient to construct a basic digital story on first, second, and third class levers. The selection of pictures and music was minimal, but it nevertheless allowed for some variation in digital story design. Each step necessary to complete the digital story was captured with



FIGURE 2. This digital story video provides the definition of a digital story, reasons for using digital storytelling, and examples of classroom use.

color screen shots. Additionally, the lessons contained step-by-step instructions above and beneath them as necessary. Instructions above were directions to introduce the inserted screen shot. Arrows, comment balloons, and occasionally highlighted or bold red text helped to clarify the directions and illustrations (Figure 1).

As both a motivational activity and a lesson introduction, the original lesson design began with a professional development instructor using a sample digital story to introduce the concept of digital storytelling. The short video also focused on reasons why teachers would want to incorporate digital stories in classroom instruction. Furthermore, the introductory digital story also emphasized the technology standards for educators stated in the Nets for Teachers 2008 by The International Society for Technology in Education (ISTE, 2008) and recommendations and action steps for the integration of technology in education given by the U.S. Department of Education (2006). This short video remained unchanged in the final three-lesson design, and allowed the teacher to view it independently from files on a compact disc before opening the three lessons (Figure 2). The final lesson design incorporated a cleaner look and more detail (Figure 3 and 4).

Step 9 - Next you must add text to the corresponding files.

Graphic boxes - select alignments

In the above diagram the arrow points to a window that asks you to

<Type text to add a title on the selected picture>

Now, type in your text as specified in your digital storyboard. Next, find the graphic boxes above the text box. These allow you to select the vertical and horizontal page alignment of the text. Select the appropriate alignments. **Select next.**

FIGURE 1. A sample artifact from the original lesson design on first, second, and third class levers.

Digital Storytelling Lesson 1 Technology Professional Development

Learning Objective: At the end of this lesson you will be able to

- Create an organized designated folder for your digital story project.
- Define a digital story and produce a storyboard related to your content area.



Definition of a digital story: According to Kajder, Bull & Albaugh, 2005, p. 40, “a digital story consists of a series of still images combined with a narrated soundtrack to tell a story”.

Create an organized designated folder. When you are inserting photos or videos into the Microsoft Photo Story 3 application, you are directing the application to look for these images in a specific place on your computer. Make sure you make a specific folder for your new digital story project that will always be in the same place on your computer (ex. your desktop). Each digital story project should have its own project folder (Pratt, 2010).

FIGURE 3. The revised lesson design, including detailed instructions on how to create the teacher’s own digital story instead of a predetermined story on levers.

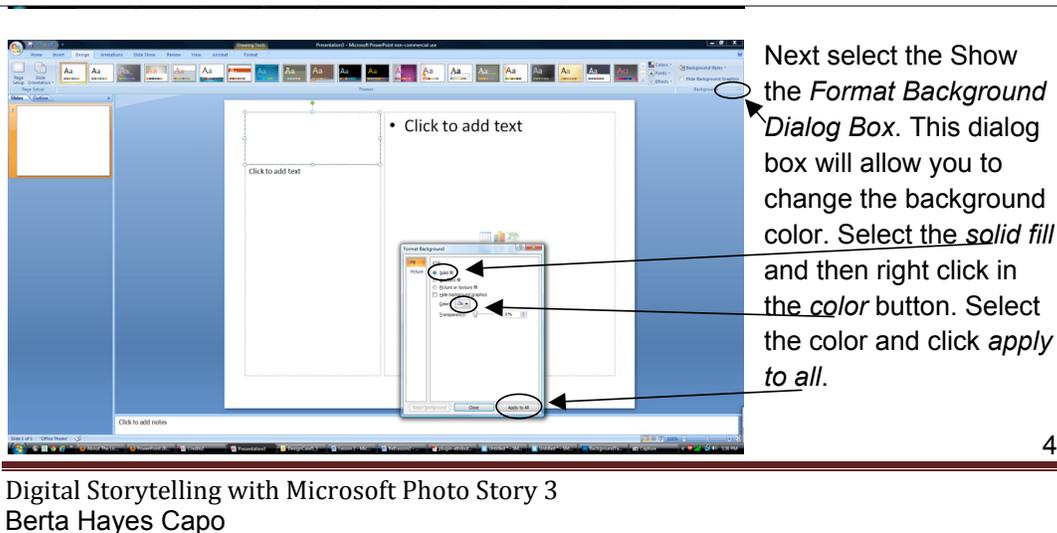


FIGURE 4. A section of the revised three-lesson format that includes added instruction and wrap-around text.

Systems Design Approach

I wanted the instructions in the lessons to flow logically and to meet the desired learning goals. Therefore, a systems design method was employed to structure the lesson design due to this method’s focus on sequence and analysis (Dick, Carey, & Carey, 2008). According to Dick, et al. (2008) “the systems approach is basically a design process, whereas types of instruction, instructional media, and individualized versus group activity are all decisions made within the design process” (p. 9). Furthermore, Dick, et al. (2008) break down the design process into logical components that feed into each other and provide needed design information for

each subsequent step in the design process. This analysis and input of information assures that the design meets the desired learning goals (see Figure 5).

Informal Learner Analysis

According to Dick, et al. (2008), a systems approach required an analysis of the needed lesson goals. Moreover, activity theory suggests that an instructional designer list goals and motives that are subject-driven. Thus, both the theoretical and design approaches target the important learning goals. In addition to these learning goals, interviews and observations can assist the designer in identifying factors

PLANNING TEAM
Administration and selected teachers, including the primary designer

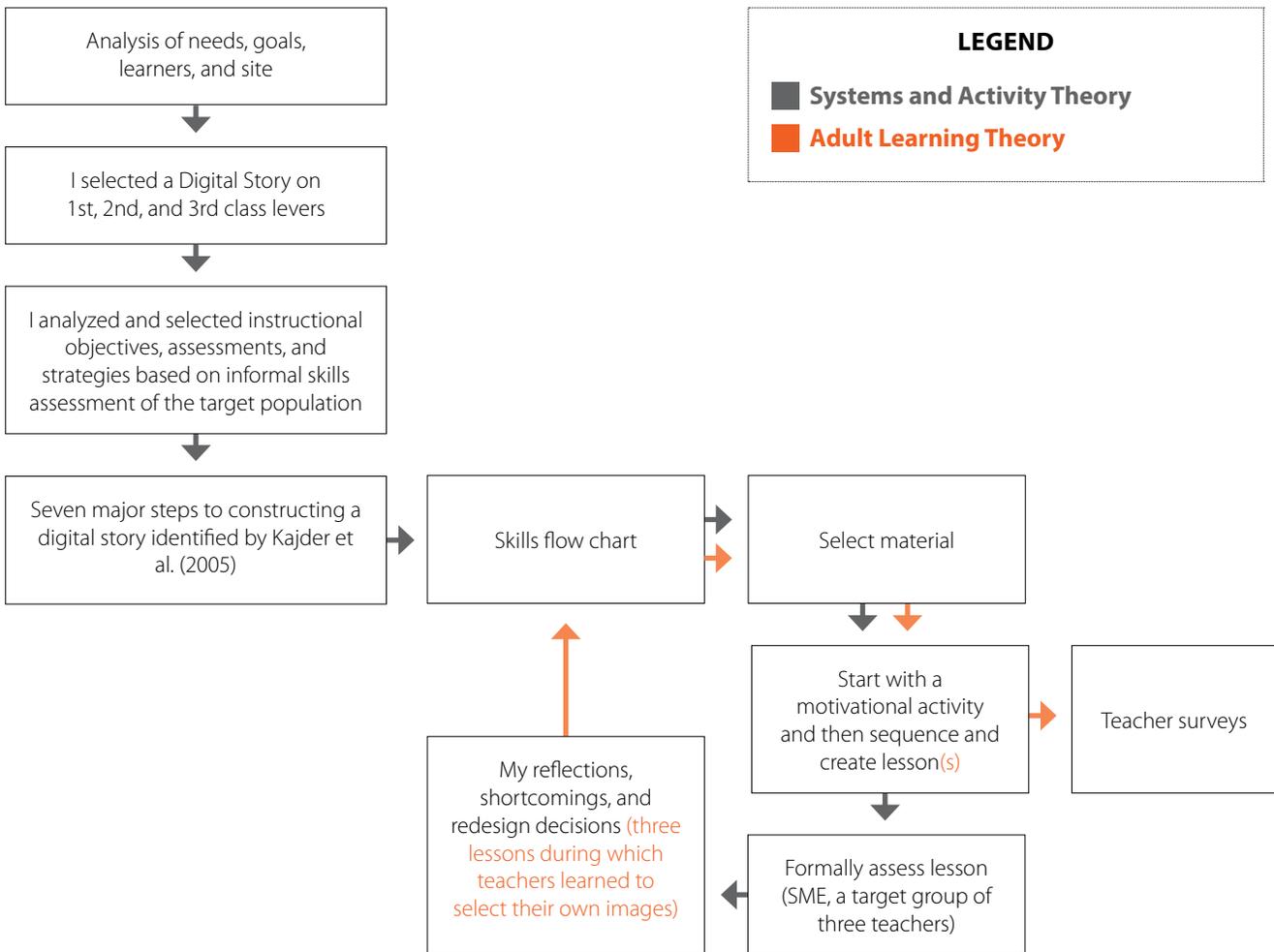


FIGURE 5. A design mind map of the final professional development lesson. The orange sections were added as needed, to guide the redesign of the now three lessons.

affecting the design (Jonassen et al., 1999). An informal learner analysis was conducted using information obtained through interviews with teachers and personal observations of teachers at this high school. Due to the teachers' increased workload, it was too difficult to do in-depth interviews. Several important implications emerged from this analysis: 1) the lesson must be relatively basic to allow teachers to focus on their changing state-required accountability responsibilities; 2) all of the necessary components in the lesson had to be easy to access due to time limitations; and 3) the lesson should be meaningful but short. In addition, some teachers suggested that research on classroom technology integration be made available to them once the digital storytelling lesson was completed.

This informal learner analysis was followed by a performance context analysis, in which I used interviews and observations to analyze supervisory support and the physical and social aspects of the high school work site. It was initially determined that the instruction could serve an audience of up to 20 staff members at a time per computer lab room. With three computer labs at the school, three professional development instructors could provide simultaneous instruction. However, available professional development time for teachers would change before the design was completed, and although the computer labs remained a possible resource for implementing this professional development lesson, time had now become a limiting factor.

Redesign and Evolution

The design evolved from one session to three sessions and finally to a self-paced, stand-alone design comprised of a digital story video and three sequenced lessons distributed on compact disc. This necessity to expand the original lesson into three lessons became evident during the formative evaluation process. Furthermore, evolving time restrictions in the school favored a self-paced lesson. These three lessons were designed to teach high school teachers how to construct content-specific digital stories to infuse digital story telling into their classrooms' instruction. The final disc format of the lesson incorporated a flexibility of presentation, thus benefiting the changing school environment. With added distribution flexibility, this new design format could be introduced and distributed to teachers quickly at a faculty meeting, or the Microsoft Word documents could be printed and used for face-to-face professional development. Following administrative approval, these modular lessons could also be posted to the school's web site.

Following the systems approach of Dick, et al. (2008), a diagram was created which included the steps necessary to achieve the goal of creating a digital story. This initial skills diagram included skills needed on entry to the class. Kajder, Bull and Albaugh (2005) list seven steps in the construction of a digital story (see Figure 6). These seven steps were used to design the lesson and were further broken down into their component skills and sequenced appropriately. Working through the digital story making process while simultaneously creating the rough draft of the skills diagram was helpful for sequencing, and this procedure was also employed for the redesign of the lesson into three lessons. To create the original lesson and subsequent lesson redesign, both the diagram and software were employed. The lessons were created by simultaneously working with the necessary software tools on one screen while creating the actual written lesson on a different screen and following and adjusting the flow of necessary steps. In this testing process, I did not use the images selected for the original lesson design, and this led to a design flaw in the original lesson that will be discussed in the following section.

Final Design

The original terminal goal of the lesson was to have teachers create a digital story for use in their classroom that focused

on creating a sample digital story on levers. The new three-lesson design now had the following three terminal goals:

- **LESSON 1** Know what a digital story is and how to construct a digital storyboard.
- **LESSON 2** Create an image folder for the teacher's content-specific digital story while following copyright laws and guidelines.
- **LESSON 3** Create a content-specific digital story.

The process of gathering the photographs and music for the original lesson had included scanned hand drawn representations of levers, original pictures, screen shots with inserted instructions, pictures from a purchased picture database, and different music files gathered online from public domain and copyright-free sites. These were placed into two labeled folders on the computer's desktop. The aspect ratio of the images was not addressed and the images were not previewed in Microsoft Photo Story 3 as they should have been. Therefore, the pictures with the improper aspect ratio contained unbecoming black borders when selected for use in the software. Additionally, the original lesson did not include instructions for cropping images or removing these black borders from the images. This caused the lesson participants to lose time trying to figure out how correct this issue, and some participants became frustrated and complained.

The second lesson included instruction on how to gather images while ensuring that copyright laws were not being broken. During the informal interviews, teachers expressed a desire to learn more about different copyright licenses and how to gather and cite legal images for the web and blogs. According to activity theory, informal interviews assist the designer in understanding design flaws and factors and should be a part of the task analysis (Jonassen et al., 1999).

The design of this second lesson on copyright compliance was relatively simple. According to the University of Wollongong Library (2010), teachers and students need to review how their images will be used in order to decide whether Fair Use policies are sufficient or if stricter copyright guidelines are required. A straightforward diagram showing fair use and the process of complying with image crediting requirements was created using the Wollongong Library resource (Figure 7).

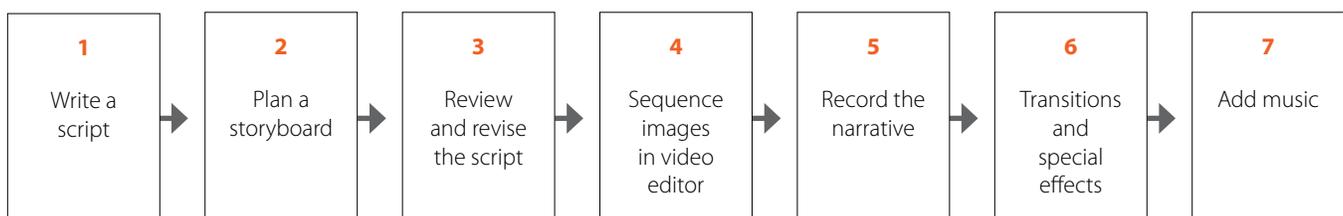


FIGURE 6. Steps to create a digital story (Adapted from Kajder et al., 2005).



FIGURE 7. A diagram created to explain basic copyright rules (adapted from University of Wollongong Library, 2010).

At the same time, the lesson on finding and citing images remained uncomplicated by copyright law, encouraging teachers to focus on Creative Commons copyright images from advanced searches in Google Images and Flickr (Figures 8, 9, and 10). The copyright advantages of creating their own images and drawings were also introduced. Teachers were also directed to a resource file included on the compact disc that contained the Internet Guidelines for this Florida county, and Copyright and Fair Use policies and guidelines. Attributions were defined, and the lesson stressed reading and following all copyright license information.

The lesson now met adult learning theory requirements by allowing teachers to gather their own images. Of equal importance, this change in the design of the lesson coincided with an activity theory task analysis. In activity theory, the task analysis should list and conform to motives, which in the context of this design are teacher-driven motives (Jonassen et al., 1999). Teachers could now create their own content-specific digital stories. In addition, teachers would have a simple tool to instruct students on copyright law.

EVALUATION OF THE DESIGN

There were two separate design evaluations, one formative evaluation for the original one-lesson design and a second informal evaluation for the portable three-lesson design. Changes to the design were based on these evaluations. The initial formative evaluation provided the most information and initiated the most change to the design. The following paragraphs will discuss the evaluation of these designs in chronological order.

Formative Evaluation

A formative evaluation was conducted on the first initial lesson prior to redesign, in order to determine needed changes. The purpose of this initial, formative evaluation was

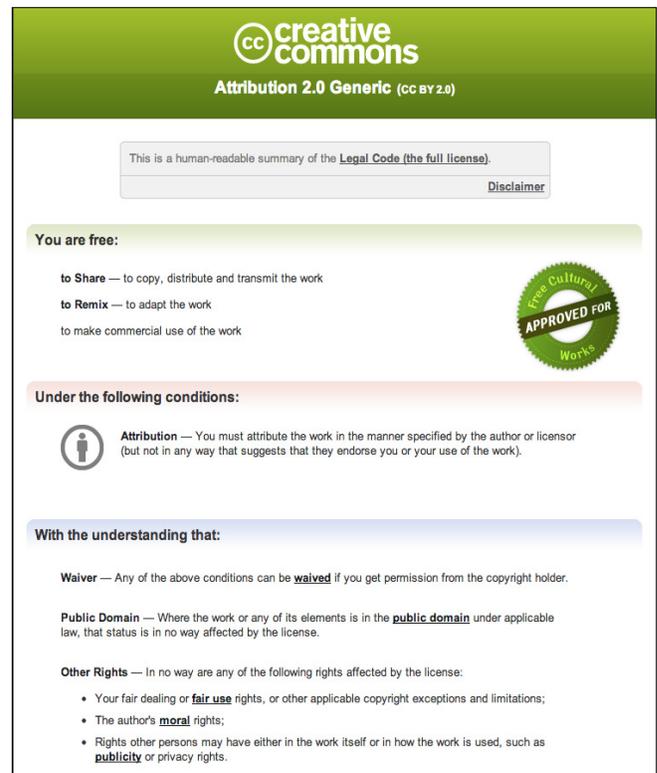


FIGURE 8. A sample Creative Commons license used to identify the license and the required attributions to the teachers. (<http://creativecommons.org/licenses/by/2.0/>)



FIGURE 9. A diagram used to guide teachers through the advanced search procedures in Flickr (<http://www.flickr.com/>).

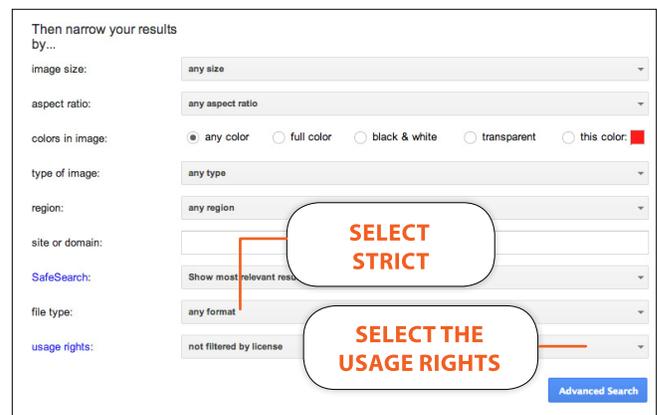


FIGURE 10. A diagram used to guide teachers through advanced searching in Google Images (<http://images.google.com/>)

to ensure that the print-based lesson and components were complete, easy to follow, and taught the terminal objective of the lesson effectively. For this formative evaluation, I solicited a design expert review, a one-to-one subject matter expert review, and a small target learner group review of three science teachers with varying degrees of computer technology ability. The target learner group included a low-level technology user, an average level technology user, and a high level technology user. In retrospect, a more varied group of reviewers from multiple disciplines would have been a better choice and the folder should have included pictures for lessons in different content areas. Thus, various subject matter experts (SMEs) would also have been required.

The design expert for the formative evaluation was the computer technology instructor at the participating south Florida high school. She is also an instructor that in the past has provided technology professional development to the staff at this participating high school. This design expert noted that the instructions on page 4 were unclear. These instructions involved developing a script for the digital story, and asked the participants to refer to two separate appendices. One appendix was a sample script on levers and the other was a blank script with an assessment question. Since the sample was already a script on levers, it was confusing and redundant. After reviewing the print-based lesson, the design expert suggested the removal of learner handouts from the lesson appendices and suggested appendices be used sparingly. This use of appendices also proved to be disliked by some of the target learners reviewing the lesson. Additionally, the design expert noted the absence of a lesson conclusion, and recommended that the word "learner" be removed from the lesson objective. A high school science teacher served as SME for this evaluation.

The original print-based unit was utilized as one of the formative evaluation instruments and the reviewers underlined, highlighted, or circled words and phrases and added comments directly into the print based material. In addition, written observations, informal interview questions based on comments and reactions were made by the reviewers, and two different Likert scale questionnaires were used as formative evaluation instruments for the original lesson (see Appendix A and B).

Time was a limiting factor in this extremely busy high school. Some teachers did request to take the material and complete it at home. This did limit any observations and restricted the formative evaluation to questions, written comments, and the questionnaire. Some data was probably lost due to faulty recall.

Both the SME and the target learners scored the original digital story lesson poorly when evaluating the amount of time required for lesson completion. Removing the black

borders from the images with poor aspect ratio without instruction proved very time consuming. Additionally, the script and storyboard activity were not accepted well. A lesson redesign was required to allow learners to produce their own simple script and digital story for their subject area. Additionally, proper image aspect ratio and image editing needed to be addressed in the final design.

In addition, the wording of objectives was confusing. The objectives should have focused on what the teachers will be able to do when they complete the lesson. The evaluators required more clarification and specific instruction on image editing and copyright so that the teachers could produce a product with content for their specific classroom instruction. Therefore, the objectives needed to change and the conclusion of each new lesson had to relate the learning to the lesson objective to limit confusion.

Redesign Based on Formative Evaluation

A new lesson plan was constructed due to the comments and evaluation of the initial formative evaluation. The three initial chunks of content were rewritten as three separate lessons in three separate Microsoft Word documents (see Appendix C, D, and F). These documents were meant to give flexibility to the mode of presentation, allowing the documents to be distributed to individual teachers or presented in face-to-face professional development sessions. Instead of providing teachers with a folder of images, teachers would be taught how to gather their own images and how to select images from the Internet that can be cited and legally used.

After informally interviewing teachers from different departments, the lesson dealing with copyright issues was designed to be used as a standalone lesson. Many teachers expressed an interest in this lesson for their own knowledge and some wished to use this lesson with their students. This lesson had to be simple and specify the most effective and quickest method of acquiring images for their digital stories and how to cite them properly.

In reflection, what appeared to be a simple lesson design required significant redesign due to an initial error in the goals analysis. Teachers preferred to construct a product they could immediately use in their classrooms. Thus, the first terminal objective should not have been simply to design one prescribed lesson on levers. Knowles' (1998) adult learning theory should have been applied to the actual selection of the first terminal objective. This initial miscalculation affected the lesson redesign by changing what initially was one lesson into three lessons.

The lessons also needed to include more information if teachers were responsible for gathering their own images. The third lesson's terminal goal of creating a content specific digital story was broken down into eight smaller objectives

CONSTRAINTS	DESIGN DECISION
One hour and twenty minutes available during early release days. The early release days occurred approximately once a month except for months with long holidays. One early release day would be made available for this lesson.	A short one-lesson design on simple levers would be produced to instruct teachers how to construct a content-based digital story for their classroom instruction.
Both informal and formal evaluations determined that both activity theory and adult learning theory were not applied well. Teachers evaluated the lesson poorly because it was oversimplified. They wanted to construct their own content specific digital story.	The lesson was redesigned to allow teachers to construct their own content specific digital story. Now, teachers would need more images.
Images with an incorrect aspect ratio and black borders were accidentally selected for the original lesson, resulting in additional time and frustration from the teachers.	Black borders and image cropping took time away from the lesson. The designer took this skill set for granted. Teachers needed specific instruction on this task.
Teachers wanted more instruction on copyright regulations.	The lesson had to instruct teachers in the task of copyright friendly image acquisition, therefore a standalone copyright and image editing lesson was developed.
Two opposing constraints—lack of time and the teachers' needs to achieve the desired learning outcome.	The lesson went from a one lesson design to a three lesson design that could no longer meet the time limitations.
The outside accreditation team suggested a need for more technology resources for the school's teachers. Therefore, limited technology was now a newly identified constraint.	The three lesson design was made into a paper-based, self-directed lesson in a compact disc format.
SB0736 and performance pay eliminated all available in school time for professional development for anything other than testing and accreditation needs.	The three lesson design was made into a paper-based, self-directed lesson in a compact disc format.

TABLE 1. Design constraints and the design decisions made.

that included image selection, removal of black borders and other necessary tasks to complete their digital story. The constraints that affected the progression of the design are sequenced in a table (see Table 1).

After the redesign was complete, the three lessons were copied onto compact discs for distribution to the teachers, which contained the three lessons, a blank storyboard, and a resource folder of school board and county policies.

Informal Evaluation

Due to testing and accreditation demands, this new design was only informally evaluated. I selected several teachers to review the lessons and interviewed them. Finally, I decided to include a short survey at the end of each lesson for further lesson evaluation. This survey contained nine Likert scale questions, and an optional, open response question. The actual lessons will be distributed at an institute of higher learning in 2013 and it is expected that the survey feedback

will provide important information to continue to improve the three-lesson design.

DESIGN FAILURES

The first lesson design did not take Adult Learning theory into account and teachers did not like the lesson as a result. As discussed earlier, self-direction is an important component of Adult Learning Theory (Knowles, 1998). Teachers wanted a product that they could use in their classrooms and the original lesson forced the teachers to produce a story not of their choosing and not necessarily in their content area. Therefore, the lesson's goal of having teachers produce content specific digital stories for their classrooms had not been met. I realized that in trying to fit the lesson into the short time that was initially available, I had oversimplified the lesson (see Table 1). The motivational goals of the learner revealed in the activity theory analysis were not addressed (Jonassen et al., 1999), and this oversimplification along with difficulties in image selection forced me to reflect further on

the design. Initially, I thought once teachers constructed a digital story on a simple science concept the lesson would serve as an example of how digital stories could be used to teach content in their classrooms and have the dual purpose of teaching them how to construct a digital story. Having all participating teachers construct a digital story on one preselected topic did not receive positive responses from even the science teachers. All teachers wanted to select their own topic. With this shift in focus, the redesigned lessons would take longer for the teachers to complete.

The second design flaw, as previously discussed, was the quality of the images selected for the lesson (see Table 1). Images that did not have a 4:3 aspect ratio produced black borders when inserted in the Microsoft Photo Story 3 film strip. Teachers became very frustrated and lost time in the process of removing the black borders. Since teachers wanted to produce their own content specific digital stories, the instructions for proper selection of appropriate image size for this software had to be included in the final lesson design. Of equal importance, black border removal procedures and cropping became an important part of the final lesson design. If the images had been selected with the correct aspect ratio originally, I may not have noticed that removing black borders while constructing digital stories were as frustrating and time consuming as it proved to be. Perhaps it is easy to overlook a skill that one takes for granted, yet is important for the flow of the lessons.

CONCLUSION

Teachers have a limited amount of time to devote to professional development in many schools, but at the same time, professional development in the area of technology integration is being emphasized by the U.S. Department of Education (ISTE, 2008; U.S. Department of Education, 2010). As part of a professional development initiative in a south Florida high school, a short and effective lesson design on the creation of digital stories was created to demonstrate technology integration skills.

It was observed that creativity must be used to provide professional development when multiple demands are placed on available professional development time. It is important to review and describe the design of lessons produced for professional development in order to meet a defined need for the target population, and lesson quality must not be sacrificed due to time restrictions.

According to Smith (2010) an analysis of design failures is a key component of a design case. I began this design process by stating that the target audience was adult learners, and as such, Knowles' adult learning theory should have been a major part of the decision making process in the initial design. According to Atherton (2011), an important adult learning need emphasized by Knowles is that adults must

be allowed to have "self-direction." This was not given to the adults in the first terminal objective. The final design provided the teachers significantly more "self-direction" while providing the instruction to create an individual digital story and simplified information on copyright law that can be used by the teachers and taught to their students.

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Microsoft Photo Story 3 is a registered trademark of Microsoft Corporation in the United States and other countries.

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APPENDIX A

Subject Matter Expert Questionnaire with Comments

The following questionnaire was completed by the Subject Matter Expert (SME). The Likert Scale score selected by the SME has been highlighted and the comments they provided has been included. The comments encompass both written responses and verbal responses. The SME elaborated on her comments and reactions when verbally questioned by the instructional designer.

5: Agree; **4:** Somewhat agree; **3:** Neither agree or disagree; **2:** Somewhat disagree; **1:** Disagree

QUESTIONS	5	4	3	2	1	COMMENTS
1. Is the time allotted for the lesson sufficient?	5	4	3	2	1	Suggested the lesson be divided into several lessons.
2. Are the performance objectives sequenced correctly?	5	4	3	2	1	There was a problem with the instructions to hit next that was misplaced in the lesson order.
3. Is the lesson information accurate? If not, then what information is inaccurate?	5	4	3	2	1	
4. Was the lesson content missing any necessary information required of a first lesson?	5	4	3	2	1	The lesson appears to be well organized but there are always glitches when computer lessons are given to students without program familiarity. The Subject Matter Expert is certain that this lesson will require more time to complete when it is actually implemented with a class of teachers with different computer skills.
5. Does the lesson teach the basic information necessary to construct a digital story?	5	4	3	2	1	Yes, but does not like having teachers simply copy the storyboard. Suggests this section be broken down into a separate lesson and allowing teachers to construct their own simple storyboard.
6. Do you believe an average high school teacher will be able to understand the basics of constructing a digital story after completing this lesson?	5	4	3	2	1	Yes
7. Was the lesson logically ordered?	5	4	3	2	1	Yes, except for the instructions for maneuvering through the program was one step behind.
8. Were the materials appropriate for the lesson objectives?	5	4	3	2	1	Redesign the storyboard written activity.
9. Was the rubric provided sufficient for the digital story evaluation?	5	4	3	2	1	The rubric point system seemed arbitrary and required a more even distribution of points based on task importance.

APPENDIX B

Target Learners Questionnaire with a Composite of the Target Learner's Comments

The following chart contains a summary of the comments made by all target learners. Additionally, the mean average Likert score for each item was calculated and entered.

5: Agree; **4:** Somewhat agree; **3:** Neither agree or disagree; **2:** Somewhat disagree; **1:** Disagree

TARGET LEARNER QUESTIONS	MEAN SCORE	SUMMARY OF ALL TARGET LEARNER COMMENTS
1. Is the learning objective appropriate for a 30 minute class?	2	The average completion time was 1 hour and 10 minutes.
2. Is the learning objective useful and of interest to high school teachers? If not, what should be added or changed?	5	
3. Are the performance objectives sequenced correctly	4	Two of the Target Learners noticed the need to shift the position of the "press next" instructions to page 7 instead of on page 11.
4. Does the lesson teach the basic information necessary to construct a digital story?	4	Yes, but most of the teachers expressed a dislike for copying the storyboard. Most questioned why and 2 teachers did very little of this activity. More pictures should be added to the picture folder and the lesson should be divided into two or three lessons. The activity would then require the Target Learner to complete their own original storyboard and sequence their own pictures. This would be lesson number 1. Lesson number 2 and possibly 3 would then complete the digital story following the rest of the lesson design.
5. Is the lesson easy to follow?	3	There were several glitches with the pictures. One picture would not load and there was some trouble with the black borders on several of the pictures. These glitches caused more time loss when entering the pictures. Additionally, one student was very confused in the drop and drag instructions that were given to organize the picture order. They were trying to drop and drag the pictures in the file window and did not notice the storyline pictures appearing at the bottom of the program were the actual drop and drag was required. The instructions for this step will require clarification.
6. Was the lesson interesting?	4	Yes, except for the script and digital story activity that required duplicating. The Target Learners expressed a dislike for this and a more appropriate original script and digital story construction activity needs to be added which will require extending and dividing the lesson.

TARGET LEARNER QUESTIONS	MEAN SCORE	SUMMARY OF ALL TARGET LEARNER COMMENTS
7. Did you understand the basics of constructing a digital story?	5	
8. Was the lesson logically ordered?	4	The navigation instructions (next) need to be moved forward.
9. Were the needed materials provided?	3	Two teachers expressed a dislike with finding the materials in the appendix. All the teachers thought the screen prints helped and were very clear.
10. Were the materials provided relevant and necessary?	2	The concern for duplicating the script and storyboard resurfaced. This seems to be a legitimate concern and requires a redesign.
11. Was the rubric provided sufficient for the digital story evaluation?	2	Two Target Learners questioned the rubric construction.