

Advancing Education with Digital Photography

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Dwayne Davis

## **Proof-of-Concept.**

### **Overview**

The use of photography can be found in various areas such as post-graduate research studies, graduate programs, undergraduate courses, and K-12 educational programs with varying degrees of use over the years. Furthermore, in recent years, digital photography has seen renewed use in areas of research and deep inquiry. (Close, 2007) For example, Diane Matar, a Social Work Education researcher, used photography in a study of over 100 politically displaced people in Britain to present a vivid visual representation of the history and timeline of how people sought asylum. (Phillips & Bellinger, 2010) Additionally, use of digital photography can be found in school reform as described by Halle Preskill (1995). Preskill's studies suggest that using still photography is a valuable and effective way to document the impact of school reform and promote dialogue throughout a study. (Preskill, 1995)

### **Opportunities**

Photography can provide rich and dynamic educational opportunities for teachers and students in K-12 education. The J. Paul Getty Museum has dedicated a section of its website to photography exploration in education to help teachers enhance learning with a wide variety of themes and lessons. (www.getty.edu, 2015) The J. Paul Getty website presents photography-based lesson plans and a gallery that features photography projects that serve as rich resources for teachers to use in their classrooms. Additionally, various guides have been created to help teachers and curriculum designers find ways to enhance instruction for students of all ages in a wide range of subjects with the incorporation of photography in the classroom. (Sieber & Hatcher, 2012)

With the proliferation of digital devices in the classroom and increasing camera functionality, teachers can find valuable ways to enhance education with photography.

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Weareteachers.com is one of many popular websites dedicated to providing teachers with valuable resources, such as lesson plans. (Walker, 2016) Weareteachers.com highlighted seven ways to use digital photography in the classroom. These ideas include students creating photography badges, participating in a daily project, developing a year-end slide show, documenting family connections, creating characters for storytelling, creating posters to decorate the classroom, and writing a paper based on their images. (Venosdale, 2014) The seven examples Krissy Venosdale (2014) presents on weareteachers.com are only a tip of the iceberg in terms of the potential educational opportunities photography present in the classroom.

### **Technical Procedures of Technology**

The power of photography is achieved when students take intangible theories and connect those theories with real-world tangible applications to gain deeper meaning. In support of this theory, Marina Umaschi Bers (2008) suggest that the use of objects to think and learn has a long-standing history of effectiveness in various subject areas and early childhood education. This deeper connection is attainable with use of photograph. Photograph when teamed with a technique such as storyboarding, is one example of enhancing leaning through images. Storyboarding is an ancient technique that uses images in boxes to offer rich synthesis of information that engages and informs the learners. (Essley, Rief & Rocci, 2008) Emma Plattor (1982) suggests that visual representations should be an important part of modern students' education. Plattor uses the term picture reading to describe the act of students making meaning from digital pictures and going beyond simple text and theory. (Plattor, 1982)

Given the aforementioned research, teaming photography with the power of digital storyboarding can provide rich learning opportunities for students from a conceptual standpoint. As an example, this project will primarily use digital photography and digital storyboards to add an enhanced dimension to English Language Arts, Mathematics, Science, and Technology class

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for 20-25 fourth grade students. The technology that will be necessary in this proof of concept will be digital cameras for each student, a digital storyboard web application, and online storage.

From a procedural standpoint, the students will be given a project to carry out in each subject area. Students will be required to take pictures in their school, home, or community and apply the images to the projects in a storyboard format. Each project will range from 3-6 weeks in length. Students will be required to capture enough pictures to develop an eight to twenty-slide storyboard that visually communicates the particular course project. Throughout each project, the teacher will guide students as they work independently and collaboratively to develop and implement ideas for their projects and storyboards. A proof of concept of a digital storyboard using [www.storyboardthat.com](http://www.storyboardthat.com) for a fourth grade technology project is shown in *Appendix I*. In addition, examples of these projects are described in the example section below.

### **Powerful Ideas and Catalyst**

#### **Constructionism & Constructivism**

The core objective that underpins the use of photography in the classroom is to enhance the learning environment through deeper, engaging, social, and meaningful learning activities. The Merriam-Webster (2016) dictionary defines epistemology as the study of the nature and grounds of knowledge with reference to its limits and validity. With this definition in mind, one should employ instructional practices that are valid and grounded in the field of education, to achieve the learning goals presented. The practice of using photography in the classroom as a catalyst for learning is grounded by the constructionism theory, as presented by Bers (2008) in the book, *Block To Robots*. Bers suggests that constructionism proposes that people learn better when provided with opportunities to design, create, and build projects that are personally and epistemologically meaningful. (Bers, 2008 pg. 16) In this case, as photography is employed in the classroom, students gain the opportunity to create and learn from tangible and digital objects

that they have a personal connection to. The process of students constructing meaning using digital objects embodies similar concepts of the constructivist theory of learning; in that learners construct meaning and expression through their eyes, images, and experiences. (Steffe & Gale, 1995)

### **Engagement & Collaboration**

Use of photography in the classroom provides students with the ability to be creative and communicate traditional written information using images. Universal Design of Learning is a popular instructional design that focuses on engagement as one of three key components to reaching all learners. (Rose & Gravel, 2011) Studies of learning behavior have shown that important factors in learning are active and engaged learners. The more engaged a learner is, the more active she or he is during the lesson and ultimately more likely to comprehend the content being taught. (Michael, 2006) Engagement is achievable with the use of photography in the classroom, as it allows students to use an untraditional device, use creativity, and collaborate with peers to learn traditional content in the field of arts and sciences.

### **4<sup>th</sup> Class Projects Using Photography**

#### **Project 1: Literacy: Narrative**

The Center of Documentary Studies defines literacy through photography as a teaching philosophy and methodology that encourages children to explore their world as they photograph scenes from their own lives and use their pictures as catalysts for verbal and written expression. (LTD, 2016) A sample project for literacy through photography, could include a teacher asking students to use a digital camera to take pictures of members of their family, develop a storyboard that expresses their family connections, and write an essay explain the relationships between each family member. The final product will be a presentation of the storyboard and a written essay, which is submitted to the teacher for grading.

### **Project 2: Mathematics: Order of Operations**

Photography can be employed to teach the order of operations. In this project, student will be asked to take pictures of nine items in their school or community that have a numerical representation. Using only the number 2, 3, 4, 5, 6, 7, and 8, the students will create a numerical representation of each image that when evaluated, equals the number represented in the image. To display their work, students create a storyboard that explains each image. Additional, students will be asked to explain how understanding the order of operations help will them in college, career, or become leaders in their community.

### **Project 3: Science: Scientific Methods**

Photography is also being used to fuel student engagement and enhance instruction in the area of science. Liz Beck, a fifth grade math, science, and social studies instructor at Chicago International Charter School, developed a \$15,000 science program that integrated 35millimeter photography. (Oswald, 2008) For this project, photography will be used to teach the scientific method. Students will be given a set of eight to ten questions to form a hypothesis and test with an experiment using one of the questions. For example, one question can be, what is the fastest route from home my house to school? Using a camera, students will document his or her experiment to create a storyboard that supports the findings of the experiment. Students will use all six phases of the scientific method to complete the project. The final product will be a presentation of the students' experiment, highlighted by the storyboard during the experiment phase of the scientific method.

### **Project 4: Technology: Connecting a Desktop Computer**

In this project, students are required to use a digital camera to document and teach others about technology. Students have the freedom to select any topic of their choice. The final projects should be a storyboard that explains each step in the process to teach someone.

Appendix I, serves as an example and working proof of concept for photography infused technology project. Each student will present his or her final product to the class.

### **Limitations and Considerations**

To this point, we have discussed the opportunities presented to teachers and students with the use of digital photography, along with storyboarding, in the classroom. However, there are pitfalls, limitations and considerations that may be present with the incorporation of photography in the classroom. These may include, but are not limited to, the impact on, budget, curriculum, technology, teacher preparedness, and synergy. Regardless of the affected area, one must attempt to identify the limitations and considerations to successfully implement technologies, such as digital photography, in the classroom.

### **Budget Considerations**

Dr. Pallavi Sinha and Dr. Pratima Srivastava (2013) suggest that budget and education are reciprocal and without a proper budget, education cannot flourish. In the case of implementing photography in the classroom, it is important to consider the budget that is available to support the scale of the project. If students are required to use the camera on their smart phone, versus being provided with a \$2,000 digital camera, the cost of the project is dramatically lower. If students do not have access to a digital camera and the implementation calls for high quality resolution images, insufficient funding can cripple the project. Therefore, it is important to consider budgetary limitations in relation to the scope of the project.

### **Curriculum Considerations**

Allen Ornstein, et al., (2015) suggests that the worldview of curriculum developers shape the curricula they developed. Ornstein's suggestion presents an important philosophical consideration when implementing photography in the classroom. That is, if the intended goal is shape by a bias or personal worldview and does not reflect the needs of the students, implementation

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of photography in the classroom may produce negative educational results. Curriculum developers that understand his or her philosophy stands a better chance of making curriculum decisions with a clearer more objective lens. (Ornstein, 2015 p13) Ultimately, technology implementations such photography in the classroom stands a better chance of being success when designed with objectivity and a focus on students.

### **Technology Limitations**

To implement photography in the classroom, one should consider whether students have access to and know how to effectively use the technology. Equitable access to technology has been a topic of research for many years. (Skaletsky, et al., 2016) According to recent literature, the student-to-computer ration has decreased, narrowing the digital divide. However, research suggests that although the digital divide has narrowed, equitable access and knowledge use vary among students. (Dolan, 2016) Therefore, a teacher would be wise to assess his or her students' access to necessary technologies and provide training for students to effectively use those technologies, prior to implementation.

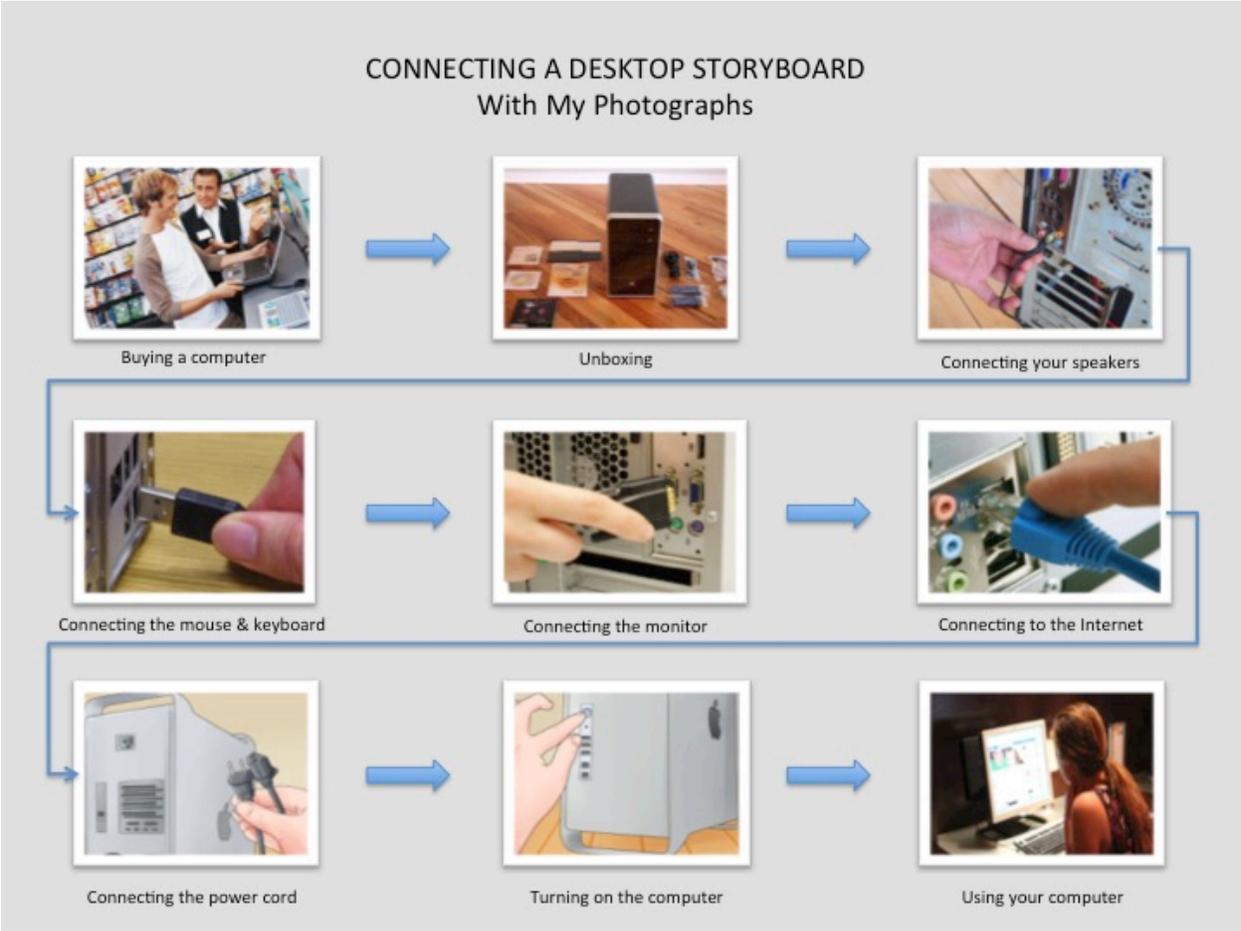
### **Teacher Preparedness**

Like many technology integration projects, teachers are responsible for effectively executing the project. If teachers lack the expertise necessary to execute the use of photography and digital storyboarding in the classroom, from a technical and process standpoint, the goal is less likely to be achieved. (Sadik, 2008) Providing support and training teachers to implement photography and associated technologies in the classroom, is key to mitigating the considerations presented with teacher preparedness. Studies show that providing teachers with pre-service trainings to develop, implement, and evaluate their use of technology, improve teacher use of technology. (Brush, et al., 2003)

**Conclusion: System View**

The Oxford dictionary defines synergy as the interaction or cooperation of two or more organizations, substances, or other agents to produce a combined effect greater than the sum of their separate effects. (Www.oxforddictionaries.com, 2016) An efficient implementation of digital photography in the classroom is one that creates synergy among other technologies, students, faculty, and other elements within the education system. The overall, goal is to use digital photography, like Liz Beck of Chicago International Charter School, to exposure student to the joy of expression and exploration while they learn core academics. (Oswald, 2008)

Appendix I: Proof of Concept: 4<sup>th</sup> Grade Technology Storyboard



*\*This concept was developed using Microsoft PowerPoint with images from various websites.*

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