INTEGRATING DESIGN AND SOCIAL STUDIES:
engineering a play

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introduction

The elementary classroom is uniquely designed to provide opportunities that integrate curriculum in meaningful ways. Ketchledge and Cantu (2013) remind us that teachers enjoy teaching across disciplines even more when they are able to integrate quality children's literature into lesson planning. Wade (2002) identified that 75-90% of social studies instruction comes from students' reading of the textbook. One of the challenges in elementary classrooms is finding time to teach the social studies content. The importance of social studies curriculum is being devalued as schools shift the emphasis to science, math, and language arts to address national and state accountability. Researchers (Burroughs, Groce, & Webeck, 2005) raise concerns about the diminishing emphasis spent on elementary social studies instruction. With the implementation of the *Common Core Standards for English Language Arts* (ELA) the percentage of time spent teaching social studies may be increased by integrating informational text trade books into the curriculum. The following lesson is an example of integrating social studies and ELA using engineering design as the mode of instruction. This activity may be used to engage students through the use of interactive strategies such as brainstorming, cooperative learning, engineering design, and peer evaluation/critique. These strategies may help students develop social and cultural skills in the elementary classroom.

text

The biography, *Bad News for Outlaws*, by Vaunda Micheaux Nelson tells the story of a former slave, Bass Reeves, who escaped to freedom in the Oklahoma Territories. Following the Civil War, Bass becomes a deputy U.S. Marshall in Arkansas under Judge Isaac C. Parker, the "Hanging Judge." During a time of vast corruption and violence, Bass stood out among U.S. Marshalls as a good man who shot criminals only as a last resort. He performed his duties efficiently, earning great respect and notoriety.

connection to third grade standards

This integrated project was designed for a third grade classroom and utilizes multiple sets of standards such as the *Common Core State Standards (CCSS) for English Language Arts* (2012), the *C3 Framework for Social Studies* (2012), and the *Standards for Technological Literacy* (*STL*) content standards (2000/2002/2007). Specific standards used can be found in Table 1.

classroom implementation: marionette design challenge (engineering a play)

During a third grade social studies unit on Arkansas history and westward expansion, students examined the importance of people and events in early Arkansas history. Students need to comprehend and be able to explain the historical significance of exploration, settlement, and statehood. One informational text that the class read was the story of Bass Reeves in *Bad News for Outlaws*. Each of these concepts is reflected in the story and provides an excellent basis to actively engage students in a narrative-centered learning environment.

Following a detailed investigation of key individuals and examination of the sequence of events leading to the settlement of the Oklahoma Territories and Arkansas statehood, students were presented with the challenge of bringing an important historical event to life: "Working as a member of a design team, you will develop a marionette play that illustrates a significant historical event. Your team will use an informational and historical text to develop

a script that includes characters and a set design that depicts scenes from the storyline. After development, you will present this historical event as a marionette play to an appropriate audience."

The big ideas for the project were: using informational and fictional texts, understanding key historical events, engineering design, puppetry, stories, simple tools and processes, as well as presentation skills to tell a story through the presentation of a play. The essential questions posed were: How does the past impact the present? How can a script for a play be developed from a book? How can the set design support the characters (marionettes) as they engage the audience through animation of the script and narration of the story? Deliverables required throughout the process included a written script, a Puppet Pals© prototype, the set design, marionettes, the production of the play, and a completed design journal. The design journal was used throughout the project to scaffold the design process.

All teams participating in the marionette design challenge were given the following parameters or constraints:
1. Identify an historical event to be used as the storyline for the marionette play.
2. Use the Puppet Pals© App to design a prototype that illustrates the first draft of the play.
3. Write a script for the marionette play.
4. Design and create the marionette characters using the materials provided.
5. Utilize recycled materials to design the set and create the marionette characters.
6. Include all team members in the marionette play (each team member must participate as a character that has a speaking part).
7. Use a design journal to conduct research and to gather information for the challenge.

The book, *Bad News for Outlaws*, can be divided into five sections. Each of these sections was assigned to a five-member student engineering design team. The first task for each team was to expand its assigned section of text and develop a script including the storyline, characters, and setting. Each student was assigned a character. If a given section of the book did not contain enough characters, the team was instructed to add a narrator or additional supporting characters.

Table 1.
Standards

| Body of Standards	Specified Standards
CCSS English Language Arts	*CCSS.ELA-Literacy.RI.3.3* – Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. *CCSS.ELA-Literacy.RI.3.7* – Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). *CCSS.ELA-Literacy.RI.3.8* – Describe logical connections between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence). *CCSS. ELA-Literacy.SL.3.4* – Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
C3 Framework for Social Studies	*D2.His.3.3-5.* – Generate questions about individuals and groups who have shaped significant historical changes and continuities. *D2.His.11.3-5.* – Infer the intended audience and purpose of a historical source from information within the source itself.
STL **Technological Literacy Standards**	*STL 9.* – Students will develop an understanding of engineering design. 9 *STL 9. C.* The engineering design process involves defining a problem, generating ideas, selecting a solution, testing the solution(s), making the item, evaluating it, and presenting results. *STL 9.D.* – When designing an object, it is important to be creative and consider all ideas. *STL 9.E.* – Models are used to communicate and test design ideas and processes.
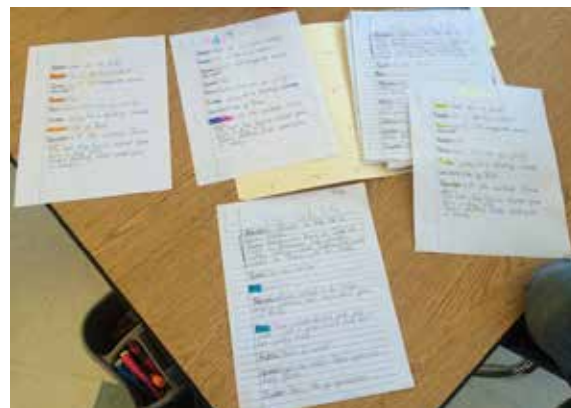
Figure 1. Third grade student scripts developed for the project.

Figure 2. Rubric used for group critique.

Group Presentation Rubric and Idea Generator

Group Members: _____

My Name: _____

Directions: Mark **ONE** statement in each row. Pick the statement that best describes the group's performance.

	Needs Improvement	Almost There	Nailed It
Explanation of Ideas and Information	I don't understand the presentation	I think I get it	I know exactly what this group will do
	Little or no support for main ideas	Chooses some facts and details to support main ideas	Chooses appropriate facts and details to support main ideas
Organization	Does not include what is needed for the presentation	Includes almost everything for the presentation	Includes everything needed for presentation
	Skips around and order does not make sense	Tries to present in order but doesn't always make sense	Presentation is in the correct order and makes sense
Eyes and Body	Does not look at the audience	Makes some eye contact	Keeps eye contact most of the time
	Fidgets or slouches	Fidgets or slouches a little	Shows confidence with posture
Voice	Speaks too quietly or not clearly	Speaks clearly most of the time	Speaks loudly and clearly
Response to Audience Questions	Does not answer questions	Answers some questions but not completely	Answers questions clearly and completely
Team Participation	Not all team members participate	All team members participate but not equally	All team members participate for about the same length of time

One thing I really liked:
One thing that needs improvement:

Throughout the project, students kept a design journal to brainstorm and document their progress. Students were instructed on the engineering design process and how this process is used by engineers and technologists to address and solve problems. It was reiterated to the students that brainstorming is an important part of the design process. The following questions were posed in their journals:

1. What is the problem you have been asked to solve?
2. What products will the team need to solve this design challenge?
3. What historical event will be depicted as the storyline for the marionette play?
4. How can your team develop a play based on the text? Students were asked to brainstorm ideas, sketch, and describe possible scenes that might be included in the marionette play.

Each design team presented its ideas to the class and received feedback in the form of a group critique (Figure 2). Next, students were introduced to the idea of creating a storyboard through the use of comic books and graphic novels. Following this instruction, each team developed a storyboard for its assigned section of the book and then used the Puppet Pals© App to create a digital prototype of their play. Puppet Pals© is an interactive application that can be used to create a digital presentation such as a play. Users can add music, backgrounds, characters, and voice recordings.

Once their ideas were expanded in the Puppet Pals © prototype, teams began designing a set for the play using recycled and repurposed materials. Teams received instruction regarding appropriate scale and dimension in regard to both the human body and the set they had created for the play. Students were encouraged to create marionettes that were realistic representations of the characters in the text chosen for the design challenge.

The final phase of the lesson included the presentation of the marionette play to an audience. In this example, the class elected to create one set for the play that was used by each team as they shared their assigned section of the text. Each team was responsible for creating an appropriate set, backdrop, and props needed for their scene change. This provided continuity of the phases of Bass Reeves' life as one continuous play rather than multiple storylines. Most importantly, it required teams to collaborate and work cooperatively as they designed the set for the marionette play.

conclusion

Understanding the importance of teaching social studies through an integrated curriculum will expose students to concepts, content, and skills that are necessary to build the foundation for becoming productive citizens in a diverse, democratic society. Recent trends in education have resulted in the reduction of social studies instruction so that more time can be devoted to literacy (*NCSS*, 2009). However, the importance of acquiring content knowledge and vocabulary through social studies is key for successful reading comprehension. It provides the contextual foundation for students to make sense of what
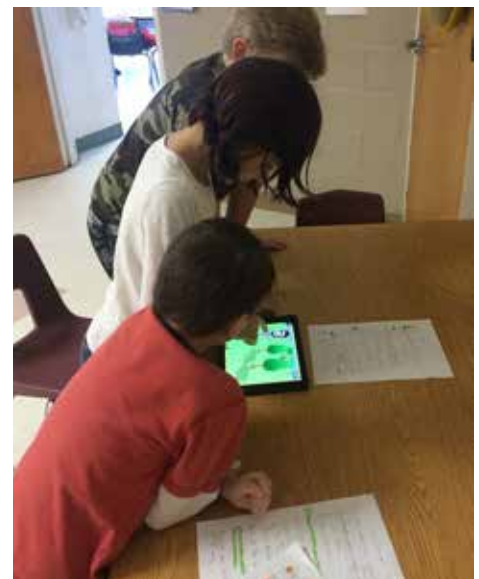

Figure 3. Third grade students creating their prototype play using Puppet Pals©.

Figure 4. Student building a marionette puppet.

they are reading. By incorporating the engineering design process as part of this integrated curriculum approach, real-world challenges of teamwork, brainstorming, problem-solving, design, organization, production, and communication are addressed as part of the curriculum by actively engaging students as they acquire skills crucial to the development of social and cultural awareness.

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Figure 5. Third grade students' marionette play performance.

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