

Seamless Integration of Technology into an Industrialization Unit of Study

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A significant number of inventions and innovations appeared during the time known as the Industrial Revolution. Changes in technology quickly transformed American life in the past and continue to impact businesses, communities, and schools today. Technologies like Skype™, Prezi®, and Poll Everywhere™ provide new methods for engaging students in learning and assess their understanding of content. Each of these technologies is free and can be used in one-computer classrooms or computer labs. These technologies can enhance the learning experience by engaging students in critical thinking and collaboration, allowing real-world applications of the content, and profiling various perspectives while utilizing digital tools that captivate students' interests. We showcase a myriad of ways that these technologies can be seamlessly integrated into a social studies unit on Industrialization.

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Introduction

Critical attributes for 21st century education include technology and multimedia skills (Partnership for 21st Century Skills, n.d.). The National Council for the Social Studies (NCSS) encourages the use of technology for instruction in the social studies classroom. In a position statement prepared by the Technology Select Subcommittee, the writers suggest teachers need to connect technology to the reality of students' lives and introduce technology within the context of student learning. The guidelines indicate students should see technology as a tool for understanding and enriching social studies content instead of added to learning task without an instructional purpose (National Council for Social Studies, 2006). As noted by Michael Shriner, Daniel Clark, Melissa Nail, Bethanne Schlee, and Rebecca Libler (2010), social studies teachers are deficient in the use of teaching through technology and little opportunity has been provided for teachers to learn how to use educational technologies. A 2010 report by the National Center for Education Statistics (NCES) indicated that of the public school teachers surveyed, 42% sometimes or often required students to develop and present multimedia presentations, but most (62%) used technology with students to learn or practice basic skills. When asked how frequently they or their students use computer in the classroom, 10% reported "rarely," 29% reported "sometimes," and only 40% reported "often" (Gray, Thomas, & Lewis, 2010).

As new technologies emerge daily, it is often difficult for teachers to know the most effective ways and uses of technology. In the NCSS position statement on technology states, "In a time when as a field social studies struggles for relevance, social studies educators need to recognize and promote how they are uniquely qualified and situated to enable young people to effectively use mobile technologies as a citizen, learner, and member of a democratic society in a global setting and to explore the civic, economic, and social implications of such technologies across time and place" (NCSS, 2006, para. 1). John Taylor and Mesut Duran (2006) assert that a new generation of media savvy students has infiltrated the schools. An effective teacher

masterfully integrates student use of technology by teaching content in a way that promotes creativity, critical thinking, collaboration and builds life and career skills. All of these attributes can be integrated into a social studies classroom provided that teachers embrace changes and are willing to become 21st century learners with their students.

One way to seamlessly integrate technology into a social studies classroom is through a unit of study focused on Industrialization. A significant number of inventions and innovations appeared during the time known as the Industrial Revolution and brought about changes in technology that quickly transformed American life. Without a doubt, technology still is changing American life today. Through the use of exciting and innovative technologies such as Skype™, Prezi®, and Poll Everywhere™, teachers can use new methods to engage students in learning as well as assess their understanding of content. Each of these technologies is free and can be used in one-computer classrooms or computer labs. Although there are an abundance of free technologies for classroom use, we propose to showcase a myriad of ways that Skype™, Prezi®, and Poll Everywhere™ can enhance the learning experience for all students.

Skype™

Skype™ is a resource that allows the user to make free internet calls with video capabilities (see Skype™ Homepage in Web-Based References below). Skype™ can be downloaded quite easily on any classroom computer and can allow students to interact "live" with an individual person or a classroom via the web. For video broadcasts, teachers need a webcam with the computer. In a unit of study focused on industrialization, students used Skype™ technology to interact with local business owners to gain insight on the impact of technological advances within their prospective industries. Within this dialogue, students discussed current industrial challenges as related to historical challenges and debated the most positive long-term impacts of industrialization on the United States. In an arranged Skype™ session between an urban and rural classroom, urban and rural business practices were compared. Business or political leaders often are unable to personally visit classrooms, but were willing to Skype™ from their respective offices. These conversations helped lead to discussions of relevant political and economic issues surrounding industrialization in today's societies.

During a discussion of labor and strikes, students were asked to research the Knights of Labor, Pullman Strike, American Federation of Labor, Coal Strike, Haymarket Riot, or Homestead Strike. Skype™ conversations with workers from different organizations provided students the opportunity to ask questions such as, "What is it like in your workplace? What would you like to see changed? Do you belong to a union?" Students also made comparisons between the past and present working class.

Skype™ can be easily used as a collaborative tool between schools to further develop the unit on industrialization. For example, a teacher could have a class role play historical inventors such as: Eli Whitney, Samuel Morse, James Wyatt, Cyrus McCormick, or Robert Fulton. Students who play the historical roles would research the inventor by answering the following questions: Why is this person famous? What did he or she invent? What impact did the invention have upon the nation? Creative students could design a set depicting the era and even re-enact the discovery of the invention. Another class from another school could profile wealthy barons of the Industrial Age such as J.P. Morgan, Andrew Carnegie, Cornelius Vanderbilt, or John D. Rockefeller and plan a question and answer interview session with each. Subsequently,

the students could use Skype™ technology to depict these historical dramatic sketches and interview the students in the other class. To challenge students to synthesize the information and think on a higher level, the classes could debate which historical figure most positively or negatively impacted the United States. With Skype™ multiple groups can join a session. Therefore, parents at home or home-bound students can listen or participate in the discussion. To add an international perspective to the unit, students could use Skype™ to communicate with a classroom or with a businessperson from a country other than the United States to inquire about the impact of globalization in that particular country. For other ideas on collaboration projects, teachers can examine Skype's™ education website.

Some helpful tips for optimal Skype™ usage include making sure the screen is large enough for all students to view. Some classrooms have a screen and projector so that what is viewed on the monitor of a computer can be viewed on a large screen. When students ask questions, remind them to walk up to the webcam and microphone on the computer so all participants can hear the communication. For other innovative ideas about Skype™ technology, visit the *50 Awesome Ways to Use Skype™ in the Classroom* website (see URL in Web-Based References below). This free technology encourages the representation of diverse perspectives in social studies classrooms, connects learners to the outside world, and provides students with opportunities to expand their experience beyond the traditional classroom. Skype™ is a technology that effectively and inexpensively supports this interaction.

Prezi®

Prezi® (see Prezi® Homepage URL in Web-Based References below) is a free technology resource which creates a 3D, virtual canvas for presentations, rather than slides as used on PowerPoint. Prezi® allows users to combine text, images, and multimedia to drag, tilt, or zoom in a nonlinear fashion. The larger text and pictures allow for expandable story boards. Prezi® allows the user to demonstrate the relationships of concepts to one another. On the Prezi® website there are currently 610 presentations on Industrialization created by teachers, students, and other individuals. Classroom teachers could use a developed presentation or create a new one to introduce the unit on Industrialization or a facet of industrialization.

In this unit, students in groups researched topics associated with Industrialization; developed a Prezi® presentation; and prepared for interactive discussions. The use of Prezi® forced students to break down topics in ways that invited the following questions: What key questions should be investigated? What images should be used? How should the information be connected? What path should be drawn?

Groups chose topics such as the impact of Industrialization on agriculture, steel, railroads, monopolies, child labor, conditions of labor, life from villages to factory towns, unions, inventions, inventors, or textiles. After researching the topic, collecting information, and selecting graphics for the presentation, each group designed the presentation making sure to include connections between the past and present. Students also prepared thoughtful questions to inspire debate. Finally, each group practiced the presentation to ensure that the time limit was not exceeded. The Checklist for Industrialization Group Presentation (Figure 1) was used to ensure reliable scoring of the projects.

Another way to integrate Prezi® into an Industrialization study would be to show the development of products during this time period by depicting the production, distribution, and

consumption of goods. Prezi® is an effective tool for the creation of timelines as students develop connections from dates and descriptions related to the topic. Maps become interactive as students zoom over areas or follow directional signs. For example, students could illustrate the process of the production of steel or the building of railroads. A timeline of the railroad era or geographical maps that track railroad development across the nation can be easily displayed through this technology tool.

A challenging game for students using Prezi® is the “Six Degrees of Separation” game. This trivia game is based on the thought that everything can be connected through six associations or less. To make the connection between an insect and an automobile in the smallest number of steps, for example, a student might connect an insect to a ladybug to a beetle to a Volkswagen Beetle to an automobile. The Prezi® Industrialization projects included connections between a bathrobe and the steel industry, a guitar and the steamboat, and an elephant and a light bulb. Guidelines were set so that students would include items of historical significance.

One of the most essential questions for this unit was how technology changed and is still changing life in the world. Using the chart below, students chose eras or topics to research and then presented the findings in a Prezi® presentation.

Table 1: Impact of Technology: Past to Present

Era	Topic	Workers	Students	Factory Owners
19 th century	<i>Transportation:</i> Steam powered railroads			
	<i>Communication:</i> Telegraph			
	<i>Entertainment:</i> Circus, vaudeville, singing			
20 th century	<i>Transportation:</i> Cars (petroleum powered)			
	<i>Communication:</i> telephone			
	<i>Entertainment:</i> movies, radio, TV			
21 st century	<i>Transportation:</i>			

	electric or solar cars, high-speed rail			
	<i>Communication:</i> twitter, email, social networks			
	<i>Entertainment:</i> video games, virtual games			

In the beginning of the 19th century, for example, the main mode of transportation was the horse and carriage. One group researched the various types of horse-drawn vehicles and answered questions such as: Who would hire a hackney or hansom? Who would own a barouche or curricle? What is the difference between a phaeton and a surrey? As transportation changed over time, students could see that the gap closed between the use of vehicles by the workers, students, and owners.

The use of Prezi® encouraged our students to engage in authentic research as they searched for newspaper articles, photographs, maps, letters or other primary resources to complete their presentations. The students took on the role of a "scholarly historian" as they provided contextual information connected to their topic (Mason et al., 2000). For teachers and students who want to learn more about developing a Prezi® presentation, a Quick Start Guide is identified in the Web-Based References.

Poll Everywhere™

Text messaging has become a major communication tool among students. The social studies classroom teacher can take advantage of this tool through Poll Everywhere™, a website that transforms cell phones or laptops into a student response system (see URL in Web-Based References). It is not uncommon for a school to spend as much as \$2,000 on a student response system that allows teachers to pose questions and collect formative assessment data. Poll Everywhere™ allows a teacher to present a question to students via an embedded widget on a website or directly from a PowerPoint. The students can then respond via Short Message Service (SMS) text, Twitter™, or the web. Polls can be multiple choice questions or open-ended questions. Services are offered free of charge to groups of up to 40 people. Once an account is created the teacher can create a poll in less than one minute. The teacher can limit responders to only one vote and can provide a custom thank you note after receiving the vote. When students call the site and use the appropriate text number assigned to each multiple choice answer choice, the website creates a chart showing the students' responses. Should students not have access to cell phones, laptops can be used to access the polls.

In the Industrialization unit of study, Poll Everywhere™ was used to pre-assess student knowledge of the Industrial Revolution. This was a quick way to determine readiness and ensure instruction adequately addresses student learning needs. True formative assessment gives teachers immediate data on what students know so teachers can alter their instruction. See Figure 2 for an example of a question that could be posted on a poll site.

Figure 2. Multiple Choice Question

Which of the following was NOT a factor in the development of the Industrial Revolution in Britain?

- a. The dominance of the commercial middle class in Parliament
- b. The enclosure movement
- c. The Agricultural Revolution
- d. The shift of the population from rural to urban areas
- e. A series of technological advances (Eder, 2003)

The authors could immediately see the student response data and determine if students understood the content and if there were misconceptions that needed to be addressed. In addition to multiple choice questions, this website allowed for open-ended questions to be posed for student response. Some examples of open-ended questions included: Why did some see the cotton gin a perpetuator of evil? Overall, explain if the Industrial Revolution had more positive or negative impacts. Describe what was the most important invention during the Industrial Revolution.

One advantage of Poll Everywhere™ is the anonymity of student responses. This may encourage the introduction of more controversial topics in the classroom. For example, teachers might pose the following questions to students: Are there classes of workers in society today? Is there a job that you feel is beneath you? Would you want to work at the same job as one of your family members? Why or why not?

Poll Everywhere™ is an excellent way to encourage risk-taking with anonymous student responses. It grabs the attention of students and increases participation and attentiveness. As a formative assessment tool, it immediately gauges the student comprehension of material. An online tutorial for the use of Poll Everywhere™ is identified in the in Web-Based References.

Conclusion

Modeling and providing examples of technology use in social studies as stated by Cheryl Mason, Michael Berson, Richard Diem, David Hicks, John Lee, and Tony Dralle, is a "...vital first step in preparing teachers to fulfill the mission of the social studies" (Mason et.al, 2000, para. 24). This article provides ways in which Skype™, Prezi®, and Poll Everywhere™ can be seamlessly integrated into instruction. Through the use of these three technologies, teachers can structure a learning environment meant to develop "...independent learners, consumers and producers of information" (Frye, Trathen, & Koppenhaver, 2010, p. 49). Schools must continually move forward by addressing the changing needs of students and society. The use of technology is simply expected. Our current students are 21st century learners who use technology daily if not hourly (Taylor & Duran, 2006). It is critical that teachers enter the world in which students live, one where technology use is the norm not the exception. Skype™, Prezi®, and Poll Everywhere™, provide unique and motivational ways to engage students in instructional tasks and assessments while using technology students most likely have prior experiences with and may even use on a daily basis. The wise educator will capitalize on what students like and know about as a lens or method to learn the unknown content. Without a doubt, teachers can use these technological tools to provide instant feedback, create interesting presentations, and connect the classroom with experts around the world.

Figure 1. Checklist for Industrialization Group Presentation

- ___ Topic is thoroughly researched
- ___ Connections are made to the present day
- ___ Thoughtful questions are included which will inspire debate
- ___ Visuals are included
- ___ Presentation does not exceed 15 minutes
- ___ All group members equally participate in research and presentation

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