GPS and Geography: Using Technology to Apply Geography with Middle Grade Students

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Despite the emphasis on 21st century learning in our schools, the use of technology and the opportunity to think creatively is often lacking in our social studies curriculum. Specifically, opportunities for students to apply the five themes of geography to the world around them is hard to undertake when teaching is primarily conducted via a traditional textbook or supplemented with only audio and visual materials. In order to give students an authentic opportunity to apply the five themes of geography and to build their 21st century learning skills through the use of creative thinking tasks, handheld global positioning system (GPS) devices were introduced to a middle grades classroom. This manuscript documents the steps taken with these handheld GPS devices over the course of a two-week unit on the five themes of geography. Following a detailed explanation of each day’s activity, a discussion highlights how the infusion of technology and the opportunity to think creatively created a culture of learning within the classroom.

Key Words: Geography, GPS, Technology, Middle Grades, Social Studies, Creativity

Introduction

The students ran around the softball field with both a sense of purpose and a sense of urgency. Paired into groups of two or three students, they spoke with authority using terms such as: longitude, latitude, speed, and coordinates. They gave purpose to their actions by incorporating measurements and distances into their conversation. Working together, they passed a global positioning system (GPS) device back and forth, each interpreting the screen and adding their own comments to the conversation. The students were using the GPS devices to solve a virtual memory game, which required them to unearth the locations of matching symbols within a softball field. Some devised their own strategy to accomplish the task, while others used some of the suggestions provided prior to starting the activity. All students were engaged in the learning activity, applying aspects of both the five themes of geography and mathematics in attempt to become the first team to finish. There were 34 students, representing a diverse cross section of the student body in terms of gender, nationality, race, socio-economic status, and ability levels, and as I sat there and watched I turned to my 7th grade assistant Sabrina and asked, “What do you think they are doing?” In a simplistic manner that only a 7th grader could pull off, she replied, “Looks like they’re having fun.”

The scene described above took place one afternoon during the fall of 2011 in one of my sixth grade classes. While geography and technology was our over-arching theme for the unit we were undertaking, I would like to think that my students and I were learning much more than how to operate a GPS device or the basic tenets of the five themes of geography. We were constructing knowledge, taking the abstract bold words from a social studies textbook and giving them meaning through authentic, hands-on experiences. Each day, we fused these ideas about
the five themes of geography with different learning experiences, using technology as a medium for students to comprehend and recognize the implications that the five themes of geography played in their lives. There was no note taking or teacher lead presentation. Students did not complete worksheets on geography or take home vocabulary words for homework, nor were they asked to take summative assessments in the form of chapter tests or multiple choice quizzes to demonstrate what they had learned during the unit. All students, however, were expected to understand and, more importantly, apply the concepts of the five themes of geography to their surrounding environment through their completion of daily activities using different technology devices, specifically GPS devices. Learning was measured in this unit not by the number of correct answers, but by each student’s ability to demonstrate each of the five themes of geography and distinguish between them. Perhaps, what became most apparent was that students were enjoying their time spent learning, and that school had become engaging again.

Technology has infused itself throughout our culture, showing up consistently as a complementary part of our daily routines. This notion also is true for students, who use technology throughout the day as they navigate their experiences with others and their interactions with the environment around them. When schools eliminate and sanitize (a one size fits all approach) students’ experiences with technology, they are denying them an important opportunity to connect the information they are learning to the very fabric of their cultural understanding. This is an understanding that relies on technology in part to recognize, synthesize, and comprehend the experiences and information with which students are presented. This is not to say that students learn any differently today than they did 30 or 40 years ago, but rather that relating subject matter to the cultural background of students is even more important today. Today’s students have an affinity for most technological mediums, including: cell phones, computers, or game systems. It is within this framework I created and situated this unit on the five themes of geography. My goal was to use technology to capture the students’ interest and present the information in a way that would connect with their digital cultural background. What follows is a description of the two-week unit on the five themes of geography that I created, with a detailed description of the activities and methods used so that it can be replicated in other classrooms.

Review of the Literature

Geography Knowledge and Skills

In 1984, the Joint Committee on Geographic Education published the Guidelines for Geographic Education, which helped shape the direction that classroom teachers would take with their geography teaching practices within their own Kindergarten-12 classrooms. One of most significant features of these guidelines was the establishment of the five fundamental themes of geography. These guidelines defined the five themes of geography as Location, Place, Human-Environmental Interaction, Movement, and Regions (Association of American Geographers & National Council for Geographic Education, 1984). These five themes have become an important part of geography education in the classroom “appearing in all geography textbooks and most social studies programs as a context for geographic education” (Boehm & Petersen, 1994, p. 211). The five themes of geography were designed as a way to teach the central concepts of geography for teachers with little geography background (Boehm & Petersen,
1994; Edgington & Hyman, 2005). Teachers were encouraged to use these themes to connect to the prior knowledge their students brought into the classroom, providing a way to make geography education more familiar and relevant to their students. Thus, the five themes represent less of a concrete design for geography education and more of a framework to teach students about the geographic world in which they live.

The teaching of the five themes of geography historically has been limited to traditional teaching resources, including textbooks, classroom videos, and worksheets. Through the use of technology and other innovative ideas, teachers recently have begun to deliver these themes using a more diversified approach (Schachter, 2012). This approach recognizes both the role and importance that technology and 21st century skills can play in developing a geographic education for students. In our increasingly globalized society students will need to be prepared with an understanding of geography in order to compete with students from across the world. As indicated by Schachter (2012), “geotechnology—the combination of geography with an ever-expanding array of new high-tech jobs—represents one of the labor megatrends for the 21st century” (p. 29).

**Technology and Social Studies**

As is the case throughout education, the use of technology to supplement both the teaching and acquisition of social studies knowledge is growing within the classroom. Through the adoption of Technological Pedagogical Content Knowledge (TPCK) standards “as a conceptual framework to guide teacher preparation and professional development practices” (Debele & Plevyak, 2012, p. 286) educators have begun to integrate technology into their teaching. Technology can take many forms within a classroom, including as a tool for motivation, a vehicle for learning, and an instrument for students to create and demonstrate their knowledge on a specific concept or theme (Hofer & Swan, 2008; Okolo, Englert, Bouck, & Heutsche, 2007).

One such instrument that has begun to be used within social studies classrooms is the Global Positioning System, better known as GPS, device. The GPS represents a range of devices which are a type of “radio navigation system that allows land, sea, and airborne users to determine accurate location, velocity, and time twenty-four hours a day, anywhere in the world” (Broda & Baxter, 2003, p. 158). By using GPS devices within a classroom, teachers can create an environment where students are empowered to investigate the world around them (Broda & Baxter, 2003; Shaunessy & Page, 2006). These devices leverage the motivational opportunities that technology can provide by breaking the monotony of daily classroom routines through the use of an interactive device that promotes the use of critical thinking skills in students and the understanding of geographic concepts, especially as described by the five themes of geography (Bednarz, Acheson, & Bednarz, 2006). Additionally, GPS devices provide students an opportunity to engage in hands on learning, while enabling them an occasion to create and produce their own understandings of the five themes of geography, a key component of 21st century learning skills (Bednarz et al., 2006; Broda & Baxter, 2003).

**21st Century Skills**

The term or phrase “21st century skills” is being used more frequently within the field of education. From the Common Core’s emphasis on preparing 21st century learners to the myriad of professional development opportunities designed to promote 21st century skills, teachers are tasked with fostering these skills within their students (Common Core State Standards Initiative).
While the exact definition or description of 21st century learning skills differs depending on the source, in social studies, 21st century skills “calls for social studies students to engage in contextual learning skills, information and media literacy skills, critical thinking and problem-solving skills, creativity and innovation skills, communication skills, and collaboration skills” (Gallavan & Kottler, 2012, p. 165). Thus 21st century skills seek to transform students from a passive receiver of information to an active creator of information. This transformation can be done by giving students an opportunity to learn the concepts being studied through hands-on experiences and by producing their own examples of the materials being studied. Learning within a 21st century environment is not just between the student and the teacher, but a collective effort where the entire class is an active participant. “By making learning a social event, teachers help to keep students engaged with course material” (Tingen, Philbeck, & Holcomb, 2011, p. 88). One aspect of 21st century learning is the opportunity for students to assess and reflect on each other’s work. When teachers provide students with an opportunity to comment on and refine each other’s work, they are fostering 21st century skills in their students (Tingen, Philbeck, & Holcomb, 2011). This process enables students to develop a richer understanding of the material, leading to a more comprehensive learning experience (Gallavan & Kottler, 2012).

Context

My class is situated within a Title I school in North Carolina. Title 1 is the largest federal education-funding program. It provides funding for high poverty schools to help students who are behind academically or at risk of falling behind. Because the class is an elective, it draws students from all different ability levels. The general purpose of the class is to explain how technology affects society, thus the actual development of lesson plans and selection of subject matter is quite open, leaving it up to the teacher to decide what to study and exactly how to go about teaching it. Because of my social studies background, this class often takes on a social studies theme, as there is a natural fit between the technology that surrounds us and the role of social studies in understanding our place in society. It is duly noted that the flexibility this class presents is not something all classrooms are afforded, but it does not change the students’ experiences nor does it invalidate the methods used within the lessons.

With the assistance of an educational grant I received the previous summer, 21 handheld GPS devices were purchased for my classroom. These devices were capable of giving students a plethora of data, including exact longitude and latitude data points along with measurements of distance, speed, time, cardinal direction and altitude. These GPS devices allowed students to create and record “waypoints”, virtual markers that they could assign to specific longitude and latitude data points as they navigated around any outdoor area. By connecting these waypoints, students could create a virtual trail, a treasure map.

Students also took advantage of cell phone technology, specifically GPS enabled applications that could track cell phones in real time and could be interfaced with by using Internet applications like Google Maps and Google Earth. Students also were given a chance to interact with websites about GPS technology and other aspects of the unit. These websites delivered information to the students in much the same way textbooks do, with the added bonus of being interactive and student driven. The students were able and encouraged to explore the topic, along their own interest as they navigated the links found within the different websites, thus personalizing the content to their own developmental curiosity and needs.
Finally, students made use of video clips, designed to give background information on GPS technology and more specifically, the concept of triangulation. These clips included simulations and models that visualized for the students the process of triangulation that demonstrated how a GPS device can be located via three GPS satellites. All of these technologies were used throughout the unit by the students to help aid in their understanding of the five themes of geography. At no time did the technology become the focus of the unit; rather, technology became just a tool for comprehension, a connection to the material that the students had both a previous correlation with and an innate interest in developing further.

The Lessons

Day 1: Background Scaffolding

Our unit on the five themes of geography started like any other unit. I needed to tap into my students’ prior knowledge and build a solid base from which to scaffold their learning experiences. Terms like triangulation were foreign to them, and other concepts like latitude and longitude were understood by only a few of my students. Although some had heard of the terms, they could not correctly explain its definition or, more importantly, its use. My students had fallen victim to the rote memorization of social studies facts and, while most of them probably could have defined the terms at some point in their lives, these terms had no meaning for them now.

We began our unit by watching a short video, What are the Five Themes of Geography?, which explains the five themes and also how GPS works (Launchpad: How GPS Works). Questions were solicited and feedback given to my students based upon the discussion that ensued. Students then navigated to an on-line mind mapping/brainstorming tool (Bubbl.us: Brainstorming made simple) to begin mapping their exploration of websites about the five themes of geography and GPS technology. Students were given an opportunity to explore websites (Trimble GPS Tutorial - How GPS works? & Five Themes of Geography) about each of these topics and, in groups of two or three, create their own personalized mind maps of the topics, highlighting information they thought was important. These mind maps included facts about the topics, questions they had, their own reflections, and the connections between GPS technology and the five themes of geography.

The day ended with a class discussion about what had been learned through the activities. Students explained their mind maps and, as a class, a foundation was established to advance our studies on the unit’s topics. During the lesson, technology was interwoven throughout via the use of videos, the Internet, and an interactive mind mapping software, with the focus remaining on the five themes of geography and GPS technology. Students used their cultural comfort with technology to establish a baseline knowledge base with the topics being discussed.

Day 2: Discovery

Per the students in my class when they get a new video game or cell phone, the last thing they do is open the box and grab the instruction book. They don’t go to the table of contents and preview what the game or cell phone has to offer. Because of this behavior, most manufacturers now include glossy short instruction sheets full of pictures and short on words with the most basic tasks included to operate the device that you just recently purchased. I, therefore, decided to my students experience the GPS devices in much the same way. After explaining some basic
ground rules about behavior and expectations, we went down to the softball field. I showed the students how to turn the device on, how to change the display settings from darker to lighter, and how to switch between the menu system and different screens on the GPS device. When possible, familiar terms were used. For example, I discovered that initially my students had difficulty understanding that you could push the little “joy stick” on the GPS device to select an item on the screen. After explaining that the joy stick worked in the same manner as the “R3” or “L3” button on the PlayStation® controller, many students became quite comfortable with this feature. Once students were given a five-minute overview, I removed myself and left the class to discover the devices on their own. My only rule was that students had to keep moving while they interacted with the GPS devices.

It was not long before the students had figured out how to use the GPS devices to determine their speed in miles per hour, and mini-races sprung up. It was particularly interesting to see a group of male students measuring 40 yards using the GPS devices and then time themselves in sprints to see who had the fastest 40 time, a statistic commonly used in football evaluation. Others figured out cardinal direction and peppered me with questions about why a certain direction was north as opposed to another direction they felt better represented north. Some quickly realized that north did not represent up, and a majority found it fascinating that north was always pointing at the same spot regardless of where they stood.

Over the course of the next 35 minutes, my class explored the features of the GPS device as I watched and reflected about the experience. I noticed that rather than asking me for direction, students collaborated among themselves and often were able to “figure out” new features by sharing what they knew with other students, characteristics of a 21st century learning environment. By the end of class, all students had a working knowledge of how to operate the GPS devices, and some who had an affinity for technology had become comfortable with the features of the GPS device to the point that they were able to navigate to, and use, some of the more advanced components.

While I did not require any form of written reflection or other assignment once we returned to the classroom, in my opinion, my students had learned a great deal. From my observations, I confirmed that our students had gained valuable experience with geography concepts, including application of cardinal directions, and definition and meaning of geography terms used by the GPS device including altitude, topography, longitude, and latitude. Students also had created connections to other core subjects like mathematics through the measurement and recording of distances, speed, and time using the GPS devices. A real life connection was made to the idea of how Global Positioning Systems worked as students were able to see the GPS devices connect to different satellites and see what they had learned about the previous day. Lastly, students made connections to civic-focused social studies themes when they were able to practice and demonstrate civic cooperation between themselves, responsibility for equipment, and teamwork.

Perhaps most importantly, while learning all of these important concepts, students were engaged and enjoyed the freedom to experience learning for themselves, which are hallmarks of a 21st century learning environment. All of the previous learning objects could be found in a textbook but, by using technology as a medium, the concepts were brought to life and student daydreaming and inattention was replaced by exploration and discovery.
Day 3: Waypoints and Locations

Now that the students had a basic familiarity with the GPS devices, it was time to introduce the idea of longitude and latitude, especially as fixed points on the earth. When students read about longitude and latitude, it can become a hard concept to conceptualize because there are no actual lines of longitude and latitude students can look at and see. More specifically, the idea that each point of longitude and latitude has a unique data set that represents only one spot in the entire world is difficult to comprehend. In order for my students to better understand what longitude and latitude were beyond a basic definition from the back of a textbook, we once again turned to our GPS devices. Students went to the softball field and as a whole were given instructions on how to create a waypoint, a specific point defined by degrees of longitude and latitude. Students were put into groups of two; each group was then assigned a GPS device. Each group was given a list of landmarks around the softball field and the school yard. Examples include first, second, and third base, left field foul pole, top of the bleachers, a water drain, a sewage access hole, and the top of a nearby hill. Each group was given a slightly different list of landmarks structured in a different order to ensure that students went in different directions during the activity. Students navigated to each of these locations and recorded the location in their GPS unit by creating a waypoint for the location. The waypoint recorded valuable geography-based information including degrees of latitude, longitude, and altitude. Students were able to give the waypoint a unique name, typically based off the name of the landmark I had given them. Once all the landmarks had been recorded via waypoint, students returned to the classroom, having completed the day’s activity.

Just as in the Day 1 lesson, students experienced for themselves the concepts of longitude and latitude, along with the notion of relative altitude and sea level. All students were successful in learning the technical procedure needed to create a waypoint with the GPS device, but more importantly, they were able to understand that degrees of latitude and longitude represent real places in our world. Because first base had a different data set then second base, students came to understand that there are more than just the few lines of longitude and latitude they see on maps and globes, as every space on the planet can be defined by its position relative to longitude and latitude. This core concept became real for the students as they explored the landmarks and were reinforced time and time again as they navigated their way to the different landmarks. When debriefing the experience, students made connections to other uses of latitude and longitude, including targeting for missile systems, construction, and how car GPS systems know when it’s time to turn right. These connections and discoveries demonstrated their understanding of degrees of longitude and latitude beyond its basic definition; they were able to evaluate its practical use in our society.

Day 4: Treasure Map: Five Themes of Geography

It was now time to introduce or reintroduce the five themes of geography to my students. Each of these themes can be broken down more specifically depending on the goals of instruction. Students by now were familiar with the routine for our class. We walked down to the softball field where they paired off into groups of two and collected a GPS device from me. For the Day 2 activity, they were to use their GPS devices to navigate a treasure map I had constructed for each pair. The treasure map consisted of ten different entries marked one through ten. These entries consisted of points of latitude and longitude, the distance and direction from last entry to next entry, or the altitude relative to sea level of an exact point in a
described area (e.g., find the highest sewage drain in the school yard). At each of the places described by the entry on the treasure map, the students had to record what they saw on to the treasure map. For example, they would write that at a certain entry, they were on second base or that another entry was the entrance to the parking lot. Once the students reached the final location described by the last entry they found a plastic egg, filled with some candy. The students collected these eggs and returned them to me.

Once we were back in the classroom, a discussion ensued about how the treasure map may have taken them on a journey through the five themes of geography. Some students immediately made connections between entry points and the five themes of geography, associating 2nd base with human-environment interaction and the parking lot with movement. Once they were able to talk about it among themselves, they found examples of all five themes of geography within their treasure map. Students then labeled each entry point on the treasure map based on the five themes of geography. This assessed their ability to apply the five themes to real-life points they had traversed. They were allowed to refer back to their mind map and use Internet resources to help classify the different locations, while also updating their mind map with examples of the five themes of geography from the day’s activity.

Just as with the previous lessons in this unit, the students were able to take an abstract thought, the five themes of geography, and experience it for themselves via a treasure map excursion. In my opinion, what was once static and void of significance became real for my students as they experienced what it meant to traverse the different themes of geography during their treasure map activity. Being able to see real examples of each of the five themes of geography seemed to help the students make connections between the formal definitions of the themes and their real-life application. This day’s activity was designed to give the students some foundational support about the five themes of geography and scaffold up from the initial mind mapping activity conducted in a previous lesson. It also reinforced the previous lesson about longitude and latitude, cardinal directions, and altitude because the students had to use their understanding of these concepts to locate the particular entry on the treasure map.

Day 5 and 6: Create Your Own Adventure

After arriving at the softball field and forming their groups of two, students were told that they were going to create their own treasure map. Asking students to create their own treasure maps means that not only will they be challenged at the highest levels of thinking, but in order to accomplish this task, they will need to have a strong understanding of all previous geography concepts discussed in this unit, including the ability to apply their knowledge in creative ways in order to create the treasure maps. During the activity, students would have to document on both their GPS device and in their journal, 10 waypoints using degrees of latitude and longitude or by giving cardinal direction from a specific point and the required distance to travel. Students could, for example,—if given a starting point in terms of latitude and longitude—walk twenty yards due north. Each stop or waypoint would have to represent one of the themes of geography. In order to ensure that students integrated their treasure map with at least four of the five themes of geography, students were not able to use a theme of geography more than three times in their treasure map. Students were given the entire class period to create their treasure map, turning them in at the conclusion of class.

During the next class, students once again broke into groups of two and selected a GPS device. Students then were randomly given a treasure map and attempted to navigate its entries.
This class closely modeled the activity we did on day four, except that, this time, they were following student created treasure maps as opposed to treasure maps that I created. After students completed the treasure map challenge, they assessed the accuracy of the treasure map both in terms of themes of geography represented and use of longitude, latitude, and cardinal direction. They wrote their feedback on the bottom of the treasure maps, including any disagreements they may have had with the use of the five themes of geography or inaccuracy of longitude, latitude, or cardinal direction data sets. These treasure maps were finally given back to the original owners who could respond to the feedback and add clarification about any discrepancies. This opportunity to engage in reflective feedback with other students represents another characteristic of 21st century learning.

At no time during the two days during which this activity took place were students informed that they were “being graded”. By reading and interpreting their treasure maps, along with the peer review that took place amongst their fellow classmates about the treasure map’s accuracy, I was able to get a full understanding of their comprehension of the geography concepts we had placed at the forefront of this unit. Students demonstrated their command of the subject matter by creating, explaining, and evaluating treasure maps that captured and utilized concepts of cardinal direction, latitude, longitude, altitude, and the five themes of geography. Because the students explained concepts in terms of numbers and distance, they were both able to see a real-life application of mathematics, and gain valuable practice doing basic mathematical computation.

Assessment of student knowledge and use of GPS technology was tied into this activity. Had the students not been able to create the appropriate entries or calculate the precise distances using the GPS devices, then there would have been no possibility of creating an accurate treasure map. A fully functional treasure map signified that the students had mastered the use of the GPS technology. Lastly, throughout this activity, students worked together, sharing information and acting as student experts for those who had trouble with a task. It was not uncommon to see one student excel and help others with one task, only to see the same student ask and receive help for another task. This social interaction helped strengthen the learning taking place during this activity, as learning can be enhanced when students are grouped and allowed to learn from others within a community (Vygotsky & Cole, 1978).

**DAY 7: Extension Activity**

As we came to an end to the unit on GPS and geography, I wanted to make sure students could extend this knowledge to their own cultural background and lived experiences. I wanted students to understand that GPS technology and the way they used it to manipulate and understand their surrounding geography can be identified all around them, and not just in a GPS device located at school. I instructed students who had cell phones to take them out. Using the Internet, students looked up their cell phone online to figure out if it had GPS capabilities and what those capabilities were. Those students who did not own a cell phone picked one from an on-line electronics store and did their research on that phone as if it was theirs. Students added this information to their mind maps. Afterwards, I took out my Android cell phone. Using a free cell phone application, *Insta Mapper*, which allows for the tracking of your cell phone via GPS and *Google Maps*, I logged into the on-line website for the app. I projected my browser session onto the big screen in my classroom so that the students could see the exact location of my cell phone via *Google Maps*. The on-line website also provided the exact longitude, latitude, and
altitude of the cell phone along with its current speed if it was in motion. Three students were randomly selected and sent outside to the softball field. They were told to stand at any of the four bases. As a class, we watched on-line as the application on my cell phone updated the website so we could track the students’ movements. Once the students arrived at their base, we called my cell phone from my classroom phone to confirm the base at which they were standing. We repeated this exercise with new randomly selected students two more times, as the class really enjoyed watching my cell phone move and tracking it on its journey. Afterwards, we discussed the ramifications of this type of technology and how geography was being used by the application. Students correctly identified other uses for GPS technology like forensic science and for soldiers who might be on a mission. Students related how geography plays a part in our daily lives and how understanding geography is essential for comprehending the world we live in.

**Discussion**

It became obvious from the onset that these lessons were student centered in design. Students not only self directed their learning, they also sought out each other in addressing issues or conflicts that developed from the day’s activity. I was not viewed as the keeper of knowledge; rather, the students learned through hands-on activities that they could construct the knowledge themselves and investigate their own interests. I had no intention of having students use the GPS devices to record distance and speed, yet they developed this knowledge and appropriately used it to pursue their own interests, like seeing who could run the fastest or who could estimate a distance the best. Because the learning environment was student-centered, other issues never became a concern. For example, classroom management was a non-issue, because students were engaged and not waiting for me to provide them directions at every moment. Also, because I was more of a spectator during the unit, I was given plenty of time to interact with the different groups and use observations to form formative assessments of student learning.

Geography skills were learned and more importantly, applied by students via hands-on activities. A familiarity with the five themes of geography along with a detailed understanding of geographical concepts like cardinal direction, absolute and relative locations, and longitude and latitude were built using the GPS devices and the students’ own self-guided learning. Students learned how geography shaped their own world by discovering the many ways in which their own lives were impacted by geographical decisions. By introducing students to the many uses of GPS technology, they were able to see how geography can be applied to their own lives.

This unit also paid special attention to the need for differentiated instruction for all learners. Since the activities relied on learning through doing, for example, language barriers that often impact English Language Learners’ ability to gain new knowledge were mitigated. Students who are often marginalized because of low scores on standardized tests were able to try something new in school that was not preconditioned on how well they read or on how well they understood mathematics. Finally, developing 21st century skills is a new focus that school systems are charging their teachers with. Not only do 21st century skills include familiarity and use of technology, but they emphasize concepts like critical thinking, problem solving, cooperation with a team, and perseverance (Larson & Miller, 2011; Rotherham & Willingham, 2010). What I realized from almost the beginning, was that while my students were learning fundamental concepts of geography, they were accomplishing this learning through a 21st
century skills mind-set. Students were constantly solving challenges and problems, working with each other to mitigate questions that arose, and thinking critically about how to solve an activity or create their own challenges (their own treasure map) while using technology as the medium for their learning. Much like how a student uses a piece of paper to write a meaningful poem, my students used technology to accomplish meaningful activities in ways that challenged and improved their 21st century skills set.

**Conclusion**

Technology never became the focal point for the unit, but rather was used in conjunction with pedagogical best practices and content knowledge to create an experience for the students that emphasized learning. All too often educators are seduced into believing that technology can “fix” whatever problems emerge within the classroom. While there is no doubt that new technology has created amazing opportunities for learning to take place, 21st century learning is more than about buying the newest gadget for your classroom. Rather, it is recognizing the world our students occupy requires skills that transcend previous knowledge and requires our students to become adaptive prosumers (Toffler, 1980), individuals capable of seeking out their own knowledge. In my unit, students studied the same concepts that countless other students had studied before them; however, this time, 21st century skills were integrated into the unit to provide a more nuanced experience for the students. In other words educators don’t teach students 21st century skills; they use 21st century skills to teach students.

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