

Technology Integration Proposal

Tech-ing Around the World Unit

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Overview and Rationale

Tech-ing Around the World is a cross-curricular thematic unit of study for second grade students that aligns to the Universal Design for Learning (UDL) Guidelines. UDL is a framework that offers scientific insight to improve teaching modalities to support all learners. Tech-ing Around the World is designed for the World Cultures class in Bullock Elementary School, which takes place once a week with every second-grade class as a weekly special. World Cultures combines social studies standards in a cross-curricular setting. The goal of this unit is for students to expand their learning about various landforms, map features, and other geography skills through the use of technology tools. This unit will reinforce the material covered in students' homeroom classes through a technology lens. The unit's alignment to the UDL framework will maximize student accessibility and understanding, as this class is offered to diverse students of all abilities within the school, including students with learning disabilities and English Language Learners (ELLs).

Presently, the World Cultures curriculum is looking for more STEM integration opportunities. The new technology tools that are incorporated into the Tech-ing Around the World Unit are Photon, Ozobot and Shifu Orboot (augmented reality globe). Since all classes have between 20-25 students that are currently familiar with Google Earth and Brain Pop, Jr., having cooperative learning groups in place will allow for 4-5 students per group on a weekly rotation. This thematic unit will be piloted as a unit of study to help support student learning through technology integration as an innovative implementation into the schoolwide curriculum.

The rationale of this unit is to use technology as a tool to enhance the learning experience for all students. The various technology components mentioned in this unit will support student understanding, heighten engagement and expand exposure to various tech tools. Photon is an

educational robot which supports basic programming and the development of logical thinking for young students. Ozobot is a small bot that introduces children to variations of coding with four different color code markers; students use a combination of four colors to manipulate the movement of the bot. Shifu Orboot is an interactive globe that uses augmented reality that encourages children to explore and discover on their own. Students can scan their tablets onto various icons on the globe which will bring figures to talk, move and share facts about that specific country. Brain Pop, Jr. is an online learning platform that uses visual animation and audio simultaneously to present topics, followed by a brief multiple-choice assessment that provides immediate feedback on responses. Google Earth is a geobrowser that uses satellite images to represent the Earth in a three-dimensional format. All technologies in this unit are easily controlled, requiring minimal explanation to manipulate or understand functions.

Tech-ing Around the World Unit will be used as a means to explore and decipher which technology tools should be considered for future classroom purchase. This experimental unit will also explore the benefits of these particular technology tools, and their placement within the curriculum. Each student will get a "Passport" where they can document their learning as they *Tech* their trip around the world. Currently, there is only one Photon, one Ozobot and one Shifu Orboot Globe that have been purchased. The classroom already has access to student laptops and tablets. For this reason, a carousel rotation will be ideal to manage each center-based activity. Cooperative learning groups allow students to be strategically placed in differentiated leveled groups to support each another as they transition throughout the unit.

Implementation Proposal

Students will be divided into four cooperative learning groups. Each group will have a group leader, a timekeeper, a scribe, a floater, and a data entry person. These jobs can rotate

amongst the group as the teacher sees fit. The group leader will be in charge of insuring only one person speaks at a time, and that the tasks are completed in an orderly fashion. The timekeeper is in charge of ensuring that the group moves from one activity to the next within the allotted time. The scribe will be in charge of plugging in scores and jotting down any notes. The floater will be able to leave the group to ask a question or retrieve supplies. The data entry person will be in charge of collecting student evaluations and recording feedback videos at the end of class. Each group will have 25 minutes at each center. Each group will begin with a Brain Pop, Jr. video that will introduce related topic. After video, students will spend the remaining time completing the tasks below. If there is available time, students will have opportunity to answer multiple choice questions together and justify their answers to each other in a game format, provided on Brain Pop, Jr.

Center One: Continents and Oceans

Students will be asked to label and outline continents and oceans on a table map together using color code markers. Each student will have an opportunity to create a code that controls Ozobot to make a designated move at each continent and ocean. The marks have to match the codes on the map key which the group will create together. Students will be able to create their own codes and watch Ozobot make its way around each continent and ocean. At the end of this center, students can change codes and explore what new codes Ozobot can do around the world. Students will be asked to take a picture of their map and map key to be printed and added into their “passport”.

Center Two: Landforms

The Shifu Orboot Globe is an augmented reality globe that students can interact with using a tablet. The various icons on the globe redirect users to information about that particular

landform. Students will be able to take turns controlling a tablet and can explore facts about various landforms around the world. Students will be asked to share their findings with one another and document their learning in their “passport” handout. This handout will have options for students to draw, label and/or write about landforms students discover around the world while visiting this center.

Center Three: Reading Maps

Students will be asked to create a giant map of their choice, ie: local school, the classroom or surrounding community. Students will be asked to help Photon navigate its way around the map. Students will be shown an example of what the expectation is, and then be allowed to program Photon accordingly. Students will be challenged with the task of outlining and documenting the route to ensure Photon does not get lost. Once Photon is programmed, students can conduct test run to see if the steps inputted are successful. If they are not, students can problem solve together to reprogram Photon. Students will be asked to use coordinates in their verbiage as they program Photon. A copy of the group’s route will be added to their “passport”.

Center Four: Rural, Suburban, and Urban

Students will be given various cards with locations around New Jersey to plug into Google Earth. Together, students will take turns on plugging in information into Google Earth, i.e.: name of location, coordinates of location, etc. Groups will decide which locations are rural, suburban or urban and asked to explain their answer. Correct answers will be written behind each card. Students will also be given locations outside of New Jersey as well to work on together. Students will be given the option to explore any place around the world, and be asked

to identify location as rural, suburban or urban and document its coordinates. Students will be asked to document the areas they explored in their “passport”.

During the center activities, the teacher will serve as a facilitator to assist and answer questions. Teacher will also jot anecdotal notes on level of engagement, caveats and strengths of each activity and technology. At the end of each activity, students will debrief collectively as a class to share out loud. After the center activities are completed, students will be asked to provide feedback and share their takeaway from the activity.

Evaluation Plan

Tech-ing Around the World Unit will be evaluated on its effectiveness on student engagement, content retention and students’ ability to independently manipulate technology. Part One of the Evaluation Plan will allow students to provide feedback after each center as a way for the teacher to rate the level of effectiveness. Students can write, draw or record themselves on FlipGrid displaying their take-away from the unit. Students that opt to write or draw out their answers provides an alternative method for the teacher to gauge the perspectives of each child in a modality each student is most comfortable using. Part Two of the Evaluation Plan will be composed of anecdotal notes and student “passports”. Teacher will jot notable observations regarding level of engagement, level of independence and limitations that arise throughout the unit. “Passports” will be reviewed and shared with the class and homeroom teachers at the end of the unit. Part Three of the Evaluation Plan will be the formative assessment portion created by the Curriculum Committee for students at the conclusion of the unit. Varying the evaluation tools for this unit will provide data for a broader and deeper understanding of the successes and caveats so adjustments can be made accordingly to better suite students’ needs.

Vignettes

The vignettes below demonstrate common scenarios that can potentially take place within a typical classroom setting. The scenarios will outline how Tech-ing Around the World Unit will support student learning and maximize instructional time.

Vignette A: Supports Differentiation and Inclusion

Student A has an IEP due to communication deficits and is having a difficult time expressing thoughts verbally. Student B tends to talk a lot in class. Student A and Student B will be partnered up in the same group during this Unit. Student B will have the opportunity to be a group leader which will give him/her the opportunity to talk and support all students in the group; Student A will gain independence and feel included in class. The technologies used in this unit can be controlled and manipulated through touch. Brain Pop and the Shifu Orboot Globe provide support through mutli-sensory outputs, which fosters differentiation to support inclusion for students with disabilities within a general education classroom. Student A will be able to partake in controlling Ozobot and Photon, as it does not require audio commands. Student B will be able to assist with spearheading transitions for the group without feeling he/she will be penalized for speaking during instruction.

Vignette B: Supports Movement and Flexible Seating

Class A has many students that tend to be fidgety. The constant need for redirection takes away from instructional time, which is a complaint from all special area teachers. Providing a timed-carousel center rotation for this unit will allow for movement and purposeful talk. Class A will be able to transition from each center, which will support the need for variation in lieu of stationary seating. The teacher will be able to serve as a facilitator, while

students switch from one activity to the next. All of the centers in this unit encourage mobility and flexible seating since students are not required to sit for the complete duration of class when they handle different technologies, which will help support students that require constant physical movement to process ideas.

Vignette C: Supports ESL/ELL Students

Class B is a dual first and second grade class which is comprised entirely of bilingual students in both English and Spanish. Google Earth, Photon, Brain Pop, Jr., and the Shifu Orboot Globe are technologies that can be easily programmed to English or Spanish. Students will be able to switch to either language throughout the unit, which optimizes content knowledge. Having the ability to engage and interact with each technology in students' preferred language validates student choice and voice. Cooperative learning groups support language acquisition as students interact with one another. ELL students will have the opportunity to work together and engage in conversations that will support growth, learning and language acquisition.

Reflection

Using technology to enrich every child's learning experience as they explore aspects of our world is the underlying goal of the Tech-ing Around the World Unit. Sanholtz, Ringstaff, and Dwyer (2000) highlight the importance of educating the whole child, and the potential technology has to cause an "evolution" in education. Students' curiosity will be promoted with allotted time for discovery instead of the teacher orchestrating a scripted lesson from beginning to end. This flexibility will allow for teachable moments to be processed. Stoller, A. (2015) felt that having learning outcomes, where "rigid, definable and quantifiable ends" will cripple

student creativity. Therefore, there will be time at each center for students to explore openly and encouraged to share their discoveries with the group.

All of the technologies used in this unit align to various components of the SAMR (Substitution, Augmentation, Modification, Redefinition) Model. The SAMR Model is a framework that classifies various uses of how technology can be implemented into a classroom's instructional design. This unit will allow for both enhancements and transformative learning to take place to maximize student learning. For example, Substitution is evident when Brain Pop, Jr. replaces a class lecture to build background knowledge of content. Augmentation is apparent when students are assessed via an online quiz. Modification is noticeable when students are allowed to interact with multimedia, by way of Google Earth and the AR Globe. Redefinition is explored through the Flipgrid video option for assessment, language selection option for ELL students and the coding opportunities with Ozobot and Photon. Having centers allows for optimum probability of students being able to be exposed to the actual process of learning (Hamilton, Rosenburg, & Akcaoglu, 2016).

Having differentiated cooperative learning groups allows for students to further develop their executive functioning skills. Abejehu (2016) emphasizes how continuous assessment takes place in the classroom daily. Within each group, students will be assigned roles and provided timers to track progress, while the teacher assesses progression. Creating such an atmosphere promotes working memory, creativity and skills needed to control impulses (Diamond, 2013). Having different technologies allows instructors to use what students find engaging in a way that reinforces skills suitable to each individual's needs (Kulman, Slobuski & Seitsinger, 2014). This unit allows students to easily manipulate technologies to gain a better understanding of the

content and learning objectives. The teacher can serve as a catalyst and provide support while monitoring students as they shift from center to center.

Education reformer, John Dewey believed strongly on hands-on education. Likewise, Schliesman (2017) points out that when time is allotted for students to connect to the content in a social, emotional and cultural way creates an idyllic learning atmosphere according to the National Association for Education of Young Children (NAEYC). In addition, Copple & Bredekamp (2009) underline the importance of meeting children where they are and how incorporating play into curriculum can allow a teacher to facilitate learning and development variations within each student. *Aligning Tech-ing Around the World Unit to UDL* truly explores the possibilities of fostering critical thinking and socialization skills through the integration of technology tools, all while reinforcing content covered in class in a way that is attainable for all learners within the same environment.

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