Technology Unit for Afterschool “STEAM” Program

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Schools throughout the United States are promoting active learning in classrooms through curriculum revisions that integrate technology use in the content. Even though districts are promoting this initiative, many school districts still lack technology and the use of it throughout daily lessons in the classroom. A key distinction lies among minorities and students from low-income households in public schools in regards to the lack of technology and the use of it. Studies have shown that when compared, minority students owned fewer computers than those that come from households of the majority (Chisolm, 2001). The disparity in regards to access to technology amongst schools and students within a school is referred to as “digital divide”. The term “digital-use divide” has developed from the original term to describe classrooms throughout a school or whole schools who do not use technology throughout their lessons or the district curriculum does not integrate technology even though they have the technological devices.

As society consistently continues to evolve, technology and the use of it also continues to plays a vital role in our daily lives. Sadly, minorities and families from low-income households are the key members in our society who face the biggest impact of the digital divide (Chisholm & Carey, 2002; First & Hart, 2002). Students today are considered digital natives, but upon arrival to school, students are told to put away their devices. Schools must seize the opportunities in integrating technology to make learning applicable for all teachers and students through the effective use of technology to build technological skills strengthen learning experiences (Dagget, 2014).

In 2014, a report titled Using Technology to Support At-Risk Students’ Learning was released which identified three components to determine the effective use of technology with students in urban schools:

• Interactive lessons and activities designed for learning

• Exploration and creativity using technology

• Integrating technology and teachers effectively

The enhancement of exploration and creativity in lessons using technology gives students opportunities to divert from the traditional “Drill and Kill” strategy used when technology replaces teachers and students are expected to memorize information and are then assessed on it (Darling, Goldman, and Zielezinski, 2014).

Preparing students to be competitive in education and the global marketplace must be a priority in education. Technology must be accessible and integrated in every classroom and the curriculum. The purpose of technology integration is not to replace the teacher in the classroom since teachers hold special characteristics and traits that cannot be replaced by technology. Teachers provide students with a humanistic and emotional approach through positive and challenging events in the classrooms. Students may also find themselves in a time of struggle during a lesson or activity and teachers provide interventions in support of the technology being used.

In order to prepare students through the integration of technology, they must be exposed to technology in the early years of education. Unfortunately, many districts do not have technology integrated into their curriculum nor do they have a technology program in their schools. The following proposal is for an integration of a K-2 technology unit curriculum in an afterschool “STEAM” program. *STEAM* is the acronym, which will be used for the Science, Technology, English Language Arts, Art, and Mathematics program. This program will run Monday through Friday and technology will be taught on “technology Tuesdays”. Each unit will be 15 weeks in length and while the teacher will have various evaluation criteria for the students, the overall evaluation of the curriculum unit will be the successful completion of the performance task at the end. The foundation of this unit based on the 2014 New Jersey Student Learning Standards (8.1 Educational Technology) along with the 2016 ISTE standards for student.

As Papert believes, students should be allowed to discover and explore ideas in order to strengthen their skills rather than memorizing facts or learning skills that they will not be able to use in the future. Authentic engagement occurs when students are immersed in work that has clear meaning and immediate value to them (reading a book on a topic of personal interest. Developmentally appropriate practices also ensure that the student’s goals and experiences are suited to their learning/development and challenging enough to promote their progress and interest. It assures that goals are challenging, but achievable.

This curriculum was designed with the child in mind in order to provide them with the best opportunities to explore and discover new ideas through the integration of technology and the collaboration of peers. The need for this program and its curriculum is due to the fact that students in K-2 currently receive little to no integration or exposure to technology, but yet students as early as kindergarten are taking pre and post MAP tests in reading and math through an online platform. The Measure of Academic Progress (MAP) is a computerized adaptive test, which helps teachers improve learning for students and make informed decisions to promote a child's academic growth. Students that have no interaction with technology, have little opportunities to achieve successful academic growth when taking an assessment through an online platform. Content knowledge is not enough when students take assessments that require students to respond and use technological interactive features.

**STEAM - TECHNOLOGY**

**CURRICULUM UNIT PLAN**

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| **Course:  Technology Class** | **Grade Levels: K-2** |
| **Unit Title: Unit 1: Technology Operations and Concepts & Creativity and Innovation** | **Length of Unit: 15 weeks (1 X per week)** |
| **Stage 1- Desired Results** |
| **ESTABLISHED GOALS** Focus/Priority Standards:**8.1 Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.**A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology**Supporting Standards: ISTE for Students****1. Creativity and Innovation:** Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes     using technology.A. apply existing knowledge to generate new ideas, products, or processes.     B. create original works as a means of personal or group expression.         C. use models and simulations to explore complex systems and issues.     D. identify trends and forecast possibilities**2. Communication and Collaboration:**     Students use digital media and environments to communicate and work collaboratively, including at a distance,     to support individual learning and contribute to the learning of others.**Students:**A. interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.     B. communicate information and ideas effectively to multiple audiences using a variety of media and formats. C. develop cultural understanding and global awareness by engaging with learners of other cultures. D. Contribute to project teams to produce original works or solve problems. | **Transfer**1. Students will be able to independently use their learning to apply technology concepts, systems and operations.
2. Students will be able to independently use their learning to exercise creative thinking in designing innovative products using technology.
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| **Meaning** |
| UNDERSTANDINGS*Students will understand that…**Technology provides access to tools and information resources that facilitate the problem solving and inquiry processes.* | ESSENTIAL QUESTIONS*Students will continue to consider . . .**How do you select appropriate tools and resources for a given task?* |
| **Acquisition** |
| *Students will know…***STRAND A**Understand and use technology systems. (A8.1)Select and use applications effectively and productively. (A8.1)The characteristics and scope of technology (A8.2)The core concepts of technology.(A8.2)The relationships among technologies and the connections between technology and other fields of study.(A8.2)**STRAND B**Apply existing knowledge to generate new ideas, products, or processes. (B8.1)Create original works as a means of personal or group expression. (B8.1)The cultural, social, economic and political effects of technology. (B8.2)The effects of technology on the environment. (B8.2)The role of society in the development and use of technology.(B8.2)The influence of technology on history. (B8.2) | *Students will be skilled at…***STRAND A**Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.(A8.1)Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures. (A8.1)Use a graphic organizer to organize information about problem or issue.(A8.1)Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.(A8.1)Create and use a database to answer basic questions.(A8.1)Export data from a database into a spreadsheet; analyze and produce a report that explains the analysis of the data.(A8.1)Compare and contrast how products made in nature differ from products that are human made in how they are produced and used.(A8.2)Investigate and present factors that influence the development and function of a product and a system.(A8.2)Investigate and present factors that influence the development and function of products and systems, e.g., resources, criteria and constraints.(A8.2)Compare and contrast how technologies have changed over time due to human needs and economic, political and/or cultural influences.(A8.2)Identify how improvement in the understanding of materials science impacts technologies.(A8.2)**STRAND B**Collaborative to produce a digital story about a significant local event or issue based on first-person interviews.  (B8.1)Examine ethical considerations in the development and production of a product through its life cycle. (B8.2)Examine systems used for recycling and recommend simplification of the systems and share with product developers.(B8.2)Investigate ways that various technologies are being developed and used to reduce improper use of resources.(B8.2)Research technologies that have changed due to society’s changing needs and wants.(B8.2)Explain the purpose of intellectual property lawCompare and discuss how technologies have influenced history in the past century.(B8.2) |
| **Stage 2- Evidence** |
| **Evaluation Criteria** | **Assessment Evidence** |
| * Teacher anecdotal notes/running records
* Teacher created Demonstrations of Learning
* Teacher-created assessments
* Student self-assessments
* Peer evaluations
* Rubrics
 | PERFORMANCE TASK(S):*The students will investigate and produce a digital story about a local significant event or issue to be presented to local peers and global audience.  Investigation for final product should include, but not limited to the following: gathering data on a spreadsheet, using a database, a graphic organizer and a word processing program.* |
| * Teacher anecdotal notes/running records
* Teacher created Demonstrations of Learning
* Teacher-created assessments
* Student self-assessments
* Peer evaluations
* Rubrics
 | OTHER EVIDENCE* Assessment of the various indicators that are identified throughout the performance task.
	+ Word Processing
	+ Use of Database
	+ Spreadsheet
	+ Graphic Organizer
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| **Stage 3- Learning Plan** |
| *Summary of Key Learning Events and Instruction*

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| **Lesson #1:*** **Objective:** Learner will develop abilities to understand and use technology systems and select applications effectively and productively.
* **Suggested Activity:**
	+ Introduce Technology Vocabulary Terms, (keyboard, mouse, computer, desktop, monitor, screen, icon, application, program and home row keys). Explain each of the computer components purpose, Create a Technology Word Wall with the students as group activity. Post in their classroom in Technology Center in order for the students to continually refer back to.

**Lesson #2:** * **Objective:** Learner will develop abilitiesto select and use applications effectively and productively.
* **Suggested Activity**
	+ Introduce the Formatting Toolbar in Microsoft Word. Teach the students how to open a MS Word document. Have them type their name. Demonstrate how to change the font type, size of text and color.

**Lesson #3:** * **Objective:** Learner will develop abilities to select and use applications effectively and productively.
* **Suggested Activity:**
* Using a Microsoft Word demonstrate how to use the “MENU BAR” by inserting symbols and/or pictures from Clipart. Have students select an image of a boy or a girl that looks like them and label it with their name. Have them change the font type, size and color of text of their name.

**Lesson #4 - 5:** * **Objective:** Learner will develop abilities toselect and use applications effectively and productively.
* **Suggested Activity:**
	+ Using Microsoft Word, introduce the students to the “MENU” bar. Specifically, the “Insert” option. Show students how to insert and create a TABLE for data.

**Lesson #6-7:** * **Objective:** Learner will develop abilities to select and use applications effectively and productively.
* **Suggested Activity**
	+ Students will create a TABLE and answer basic questions on their favorite food (pizza, hamburger, cheeseburger, taco, and hot dog) and graph answers on TABLE.

**Lesson #8-9:** * **Objective:** Learner will develop abilities to select and use applications effectively and productively.
* **Suggested Activity**
	+ Students will create a TABLE and answer basic questions on their favorite food (pizza, hamburger, cheeseburger, taco, and hot dog) and graph answers on TABLE. That explains the analysis of the data.

**Lesson #10:*** **Objective:** Learner will develop abilities to apply existing knowledge to generate new ideas, products or processes and create original works as a means of personal or group expression.
* **Suggested Activity**
	+ Students will use clipart to collaborate and produce a digital story about a significant local event or issue based on first-person interviews

**Lesson #11-15:** * **Objective:** Learner will develop abilities toapply existing knowledge to generate new ideas, products or processes and create original works as a means of personal or group expression.
* **Suggested Activity**
	+ Students will use clipart to collaborate and produce a digital story about a significant local event or issue based on first-person interviews
		- Work with partners to develop a digital story. Suggested application is: Microsoft Word

**Suggested Activities:*** + - Login to account using name and password
		- Use the mouse appropriately in programs
		- Identify and find letters/numbers on the keyboard
		- Locate, open, and save files with assistance
		- Use computers for creative and expressive writing using basic formatting techniques and tools (select text to delete, copy, paste; indent, spacing, alignment, alter font/style)
		- Use computers to create multimedia presentations with text, graphics, sound, and animation
		- Use word processing program (Microsoft Word)
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Summary

Overall growth in student achievement requires students to be provided with a motivation to learn and a foundation of basic skills. Technology assists students in sparking their imaginations and authentically engaging students resulting in a positive impact on their lives. Students who have access to technology to conduct research and organize their information will most likely use this information later in life. Technology use amongst students also builds self-esteem, confidence, and allows students to take more pride in their work. While educational systems strive to provide students with quality education, there is still a lack in the integration/use of technology throughout content curriculums. Students must be prepared for a world that requires a diverse combination of knowledge and technological skills.

References

Chisholm, I. M., & Carey, J. (2002). Information technology skills for a pluralistic society: Is the playing field level? Journal of Research on Technology in Education, 35(1), 58-79.

Daggett, B. (2014). Addressing current and future challenges in education.

Darling-Hammond, L., Zielezinski, M. B., & Goldman, S. (2014, September 10). Technology can close achievement gaps, improve learning [Webinar]. Washington, DC.

First, P. F., & Hart, Y. Y. (2002). Access to cyberspace: The new issue in educational justice. Journal of Law and Education, 31(d), 385-411.

ISTE Standards for STUDENTS. (n.d.). Retrieved May 3, 2018, from https://www.iste.org/standards/for-students

New Jersey Student Learning Standards. (n.d.). Retrieved May 3, 2018, from http://www.state.nj.us/education/cccs/2014/tech/

Papert, S. (2000). What's the big idea? Toward a pedagogy of idea power. IBM Systems Journal, 39(3/4), 720.