Creating Meaningful Learning Environments with Technology

Yalitza Vega-Bajana

Michael Bermudez

Veronica O'Neill

New Jersey City University

Jersey City Public School District Technology Plan

Bers (2012) stated that developmental scientists defined the term *positive youth development* (PYD) as positive characteristics that young people should possess. Instead of describing children who are at risk of not being successful in life, these researchers emphasized the healthy behaviors that the youth must have to be successful in the classroom and beyond.

In order to use the PYD concept to examine existing technology plans' promotion of positive educational habits and values, a set of positive characteristics must be first identified and used as a criterion. Bers (2012) enumerated the following six technology-mediated skills and characteristics that can promote positive outcomes for students: 1) *content creation* (development of technology fluency and competence); 2) *creativity* (ability to create new ideas using technology); 3) *choices of conduct* (utilizing technology in responsible ways); 4) *communication* 5) *collaboration* (cooperating and working with others); and 6) *community building* (using technology to strengthen relationships in a community and solve social problems).

The PYD concept of will be used to analyze and evaluate an existing school technology plan. The Jersey City Public Schools District Technology Plan (Jersey City Public Schools District, 2016) has been chosen to convey how the PYD approach can be utilized and implemented with the incorporation of technology-based pedagogical and instructional methods. The technology plan will be examined to see if it has aspects that can be categorized into the six technology-mediated activities mentioned previously.

Content Creation

The first skill that Bers discusses in the PYD concept is content creation. Content creation is important because it builds competence, and develops the skill of computational

thinking (Bers, 2012). Computational thinking has been described by some as a basic literacy, as essential as math and science for all students (Grover & Pea, 2013).

The Jersey City Public School District (2016) specifically notes the importance of content creation in several places in their District Technology Plan. The Plan provides for assurance of the availability for each student of an Internet-enabled device and appropriate software for use in and out of school (p. 17). The Plan also provides for professional development opportunities for teachers to facilitate the "Hour of Code" program (p. 34). This is a free, one-hour experience designed to introduce students to computer science in a fun and engaging manner. A recent study by the non-profit group that promotes Hour of Code shows that participants are more favorable to computer science after completing this program (Computer Science, 2017).

There are many other resources available to engage students and enrich their computational thinking skills. For example, *Scratch* is a popular programming language developed specifically for young people by MIT. In *Scratch,* a cartoon character is controlled by moving virtual puzzle pieces which represent commands, and snapping them together. The pieces are designed to only connect if the command is logical. Debugging is an important part of the design process. The student runs their program, makes any necessary corrections, and runs it again. This iterative process has many parallels in problem solving in the real world (Grover & Pea, 2013). Oluk and Korkmaz (2016) studied students who learned to program with *Scratch*, and found a significant correlation between *Scratch* programming skills and computational skills.

Younger children can also begin to develop computational thinking using programming platforms designed just for them. The Creative Hybrid Environment for Robotic Programming (CHERP) project allows a young child to program a robot using either a virtual block language on the screen, or actual physical blocks. Regardless of which is chosen, the blocks will only fit

together if the program is logical. A preliminary study of kindergarten children showed that children who used the tangible block programming method had a better grasp of abstract concepts than those who did not use block programming (Strawhacker & Bers, 2014).

In light of the findings of these studies, it would be beneficial for the Jersey City Public Schools to incorporate programming using a language such as *Scratch* or CHERP for students of all ages in the district. This adoption would strengthen their current plans using the Hour of Code as described in their current three-year technology plan.

Creativity

The next dimension promoted by Bers (2012) is creativity, which instills confidence in students. Piirto defines creativity as "a basic human instinct to make that which is new" (Piirto and Hickey, 2012, p. 8). Most educational software programs have prescribed limits and storylines, and do not promote free and creative activities. Students gain confidence when they can imagine something, and then make it real. This can range from a webpage, to a computer graphic, to a musical composition. The key difference between this concept and creating content, above, is the element of imagination and self-expression.

The Jersey City Public Schools District (2016) includes sections which recognize that it is important to provide opportunities for creativity for all students (p. 17). Another section of the Plan describes the need to provide opportunities for creative writing experiences for students (p. 22). The Plan also calls for the incorporation of Project-Based Learning into the curriculum (p. 35). Project-Based Learning allows students to address real-world problems over an extended period of time and produce artifacts to demonstrate their learning. It is important that teachers incorporate training in the use of technology such as graphics software and web authoring tools,

to ensure that students are not discouraged as they complete their projects (Blumenfeld, et al., 1991).

It is possible to include creative activities to support confidence in many courses. For example, Hickey (2012) advocates allowing students to play with sound as part of music education, rather than only focusing on playing music composed by others. Today's music notation software allows students to create a segment of music, then hear it played by any instrument in the orchestra. The student can then modify the composition and listen again (Hickey, 2012). This process is similar to the iterative processes in many disciplines and in the real world.

Students can use software such as *iMovie* to present their projects. Counihan and Silcox (2014) describe a middle school multidisciplinary project that allowed students to combine poetry with geometry, and create an *iMovie* as the artifact of that learning. This project was a source of pride for the students, as they presented their projects to their schoolmates and parents (Counihan & Silcox, 2014). Green, Inan and Maushak (2014) studied the use of vidcasts by students in English as a second language (ESL) classes. They noted that the students improved in their language skills as they worked in groups to bring their own skills and talents to the project.

Jersey City Public Schools have included the groundwork for creativity education in their existing Technology Plan. The research indicates that it would be beneficial for Jersey City's students if the creativity development suggestions above were incorporated into the curriculum, to further enhance creative thinking and student confidence.

Choices of Conduct

Bers (2016) mentions the behavior of "choices of conduct" which notes how technology, virtual environments, and social media can become our ethical playground by offering the

options of making choices of conduct and emulating our actions. Choices of conduct extends the opportunity of making choices about our behavior and developing character traits that can lead to the use of technology in a responsible way. Children can discover their moral identities, the freedom of evaluating and experiencing consequences in different situations, and the ability to take risks in learning (Worker, 2014).

The Jersey City Public School District (2016) believes that student achievement is gained by learning outcomes garnered through problem-based learning, creative arts development, and critical thinking that also develop from the students' choice of conduct in their actions (p. 7). The Jersey City Public School District's Technology Plan indicates that technology serves as a vital critical component for participation in the 21st-century global society and reinforces the need to thrive in the digital world by thinking critically, having access to information, investigation, and collaboration (p. 8). Choices of conduct are evident in the district's policy plan on learning. The district curriculum advisors construct and provide a district curriculum course overview to higher authorities for review and approval (p. 20). Advisors revise the K-12 curriculum recurrently to provide 21st-century reasoning practices and to encourage students in developing a sense of character in their learning.

Choices of conduct is also transparent in the Jersey City District Technology Plan for learning through STEM. The Jersey City Public School District (2016) believes in evaluating new methodologies through the use of technology and advances in learning sciences to encourage students to excel in STEM (p. 22). According to the US Department of Education, the number of jobs related to STEM/STEAM is expected to grow by 14% from 2010 to 2020 (Vidcode, 2017). STEM provides students the opportunity to explore and control their learning (Istas, 2016). The STEM instructional approach allows students to relate to concepts in the

real-world, collaborate with other students and gain experience in the digital world. As Jean Piaget (as cited in Istas, 2016) once said, "the goal of education is not to increase the amount of knowledge but to create the possibilities for a child to invent and discover, to create people who are capable of doing new things."

Communication

Communication is another behavior that Bers (2010) defines as synchronous or asynchronous exchanges among peers that promote a sense of connection with the use of technology or the process of interchanging thoughts or opinions through the use of new developments in social media (Bers, 2012). In many ways, communication technology has notably changed the perceptions of students' and teachers' attitudes towards education (Kenny, 2011). Teachers are able to captivate student engagement through forms of communication technologies. The possibility of envisioning ways to connect with others through the use of technology can develop a stronger sense of understanding key concepts (Kenny, 2011).

In order to measure up with 21st-century learning, the Jersey City School District is committed to supporting staff and students so that they will advance in a digital world. Technology skills in communicating, accessing and using information, and collaborating with others are evident in the Jersey City Public School Technology Plan. For teaching, the Jersey City Public School District Technology Plan (2016) promotes educators so that they may integrate technology effectively throughout classroom subjects and expose students to other perspectives and cultures by communicating with people of varied backgrounds (p. 30). Additionally, the plan encourages educators to gain opportunities of effectively collaborating

with others by developing online learning communities that can inspire and encourage educators to continue teaching and sharing best practices.

Communication is also evident in the district's technology plan for teachers in transforming and creating learning networks within and across schools and professional organizations to provide staff with professional learning (p. 32). It is also stated that in learning, it is encouraged for educators to expand the use of Web 2.0 tools and develop teaching skills in online learning. These tools allow users to effectively interact and participate in sharing or uploading content that can provide staff with professional development (p. 36). Web 2.0 technologies urge educators to innovatively collaborate and communicate with other people who share similar interests in creating a robust learning environment (An et al., n.d.).

Collaboration

The International Society for Technology in Education (ISTE) (2017) mentioned the following four methods so that educators can become collaborators: 1) create authentic learning experiences in collaboration with fellow educators; 2) work together with students while learning new and innovative uses of digital technology; 3) implement collaborative digital tools that provide opportunities for students to work with experts and peers that reflect real-world experiences; and 4) show cultural competency in collaborative activities and interactions with students, parents, and co-educators. These approaches are evident in the Jersey Public School District's technology plan.

Collaboration is a skill that the Jersey Public School District implements in both administrative and classroom levels. The Jersey City Public School District (2016) states that in its status quo, the district has indicated that it collaborates with co-educators in other schools to make decisions regarding technology infrastructure expansion, curricular formation, and

software acquisition and educational applications for different grade levels (p. 8). Although these collaborative practices may not demonstrate active engagement in authentic learning and real-world experiences, they establish the infrastructure and technological experiences for authentic learning and innovative learning to occur. For students to develop technology-based collaboration, the schools need to provide the adequate environment and tools to promote this positive skill that can assist them in being successful in the real world.

Collaborative interactions are also evident in the district's policies on assessment use. The Jersey City Public School District (2016) actively promotes research on the application of technology-based collaborative environments (e.g. gaming technology) in assessments to increase students' motivation and provide educators with opportunities to innovatively evaluate skills and student performance (p. 15). The Jersey City Public Schools District encourages the use of these innovative technological trends that can increase student's engagement in learning.

Collaborative principles are evident in the Jersey Public Schools District Technology Plan's guidelines for instruction and teaching. The Plan encourages educators to create virtual communities that promote collaboration between educators in order to discover and learn effective teaching methods; encourage others to become educators themselves; and promote scholarship and professional excellence (p. 16). It also actively promotes collaborative interactions among Pre K-5 educators that allows them to share their experiences in using technology in their instructional practices (p. 31).

The Jersey City Public School District (2016) also encourages collaborative work among its students. The district promotes the integration of technology in students' individualized learning to enhance creative, project-based learning and promote collaborative skills (p. 29). The skill of collaboration not only builds knowledge, but also fosters students' social connections

with their peers. “Collaborative learning mirrors students’ innate desire for connection not only with interesting relevant content, but also with other students” (Ormiston, 2011, p. 20).

Community Building

ISTE (2017) stated that educators should, “Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that builds relationships and community” (ISTE Standards for Educators section, para. 3). Compared to the five other technology-mediated skills mentioned previously, community building is less apparent in the Jersey Public Schools District Technology Plan.

In some sections of its technology plan, the district mentions how educators can be facilitators of community building. The Jersey Public School District (2016) encourages teachers to be involved in professional development so that they can effectively participate and contribute in an online learning community (p. 29). The Plan also promotes the establishment of an ongoing support system (community) for educators so they can learn how to integrate technology in instruction (p. 35). Teachers can impart positive skills and habits learned in their community of practitioners to their students and other colleagues. Additionally, the Plan also states that learning in professional communities can be enhanced by the use of mobile devices (e.g. smartphones) and social media applications (e.g. Web 2.0 technologies) (p. 29). One important task of educators is to select appropriate technology-based applications that can be used for instruction and learning in a community.

Conclusion

The Jersey City Public Schools Technology Plan is a comprehensive document that details the commitments made by the district to offer their students an education rich in technology. This Plan was reviewed and compared to Bers’ (2012) PYD framework. The Plan

addressed each of the six main dimensions of the PYD framework. Many of the descriptions in the Plan represented a preliminary alignment with the framework's recommendations. In those cases, this review made suggestions to expand the existing program to align more closely with the framework. In all, the Jersey City Public Schools has made a good effort to make its district for positive youth development.

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