Transforming Traditional Teaching Practices with 21st Century Skills in K-12 Classrooms

Casey McGuire
St. Cloud State University, cjsyvertsen@gmail.com

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Transforming Traditional Teaching Practices with 21st Century Skills in K-12 Classrooms

by

Casey McGuire

A Portfolio Paper
Submitted to the Graduate Faculty of
St. Cloud State University
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Portfolio Committee:
Kristen Carlson, Chairperson
Jane Gottfried
Susan Haller
Abstract

This portfolio seeks to explore the four C’s of 21\textsuperscript{st}-century learning: critical thinking, communication, collaboration, and creativity. Utilizing academic journals and online resources specifically centered on the four C’s, this paper seeks to provide learners with definitive examples of what the four C’s look like in K-12 education, as well as provide educators with specific examples of how these skills can be enhanced in K-12 classrooms today. This portfolio examines academic journals regarding 21\textsuperscript{st} century skills, as well as provides training materials that can be used to develop a better understanding of the four C’s for K-12 educators. This portfolio also provides educators with specific websites and applications that can be utilized in the classroom to transform their own teaching practices.

*Keywords:* communication, critical thinking, collaboration, communication, Web 2.0, 21\textsuperscript{st} century skills
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Chapter 1: Introduction

Theme

For today’s learners, 21st century skill development has become a necessity in order to be successful in the future following graduation. For educators, these skills have become the focal point of best practices in instruction and education. Although the emphasis of 21st century skills on K-12 learners has been around since the 1980s and 1990s (Brusic, & Shearer, 2014, p. 7), they have been taking education throughout the world by storm with the emergence of new technologies and innovative tools for the classroom. Focusing on communication, critical thinking, collaboration, and creativity, 21st century skills are increasingly being emphasized in classrooms around the globe. Danah Henriksen, Punya Mishra, and Petra Fisser, authors of “Infusing Creativity and Technology in 21st Century Education” (2016) claim that “new technologies have altered teaching and learning rapidly, with innovations and affordances for creating and sharing ideas and content” (p. 27). With so much attention centered on the development of these skills, questions have arisen regarding the validity of utilizing certain technologies in the classroom to incorporate these skills, and how these practices compare to more traditional practices given the relatively small amount of data collected in recent years in support of 21st-century learning. For example, educators may question how one can assess growth, when skills such as creativity or communication are being measured in comparison to hard data which assesses information the learner may or may not have understood.

Education, whether it be at the elementary, secondary, or post-secondary level, has transformed since the development of Web 2.0, an internet platform that moves beyond providing information, and gives users a participatory platform to communicate and interact (Funk, 2009, pp. 48-51). With this transformation of available information, educators have an
obligation to shift their teaching focus from low-level thinking to higher order thinking in order for learners to be successful. The four skills considered to be 21st century skills include communication, collaboration, critical thinking, and creativity. It is these four skills that scholars believe to be essential in order for learners to be successful in their future careers (Brusic & Shearer, 2014, p. 7).

There will be two projects within this portfolio that focus on how to successfully implement 21st century skills in the classroom for both elementary and secondary educators. Collectively, these projects will develop an introductory curriculum for teaching these four skills in the classroom. The first project, will be a learning module developed to inform educators of the importance of incorporating 21st century skills, while highlighting the significance of educators transforming their methods of instruction in order to develop these skills. After introducing the four skills and their importance for learners outside of school walls, there will be specific examples provided that educators can utilize in their classroom to not only enhance these skills, but also ease the transformation of their teaching methods.

The second project will serve as a reference manual for educators who may want to reference further resources to help enhance their teaching. This reference manual will also serve as a tool for educators who are already implementing 21st-century teaching in their classroom, but may want to take their teaching of these skills a step further. Utilizing ISTE, the International Society for Technology in Education Standards for Educators, the reference manual will connect specific examples to each individual 21st century skill. Not only will this help to provide validity to the curriculum, but also provide educators with focus strands that they feel they may need the most support for.
This portfolio seeks to develop resources available for educators to encourage the integration of 21st century learning skills in their classrooms through the creation of a two-part, themed curriculum. According to ISTE, it is the responsibility of the educator to design authentic, learner-drive activities and environments that recognize and accommodate learner variability (International Society for Technology in Education (2000), standard 5) The themes incorporated into this curriculum aim to develop strategies and resources for educators to provide their learners with in order to develop 21st century skills for individual learners which will promote future success after their time in the classroom.

**Problem Statement**

Web 2.0 tools are transforming student learning from a one size fits all method of instruction, to a dynamic, engaging, and constructive environment for learners, thus allowing them to enhance 21st century skills; including: collaboration, creativity, critical thinking, and communication (Brusic & Shearer, 2014, p. 7). Although many of these tools have been in practice for years, concerns regarding student authenticity, lack of social development, and traditional teaching practices being blanketed by deficient technology use has raised concern about the proper development of skills for today’s learners (Brusic & Shearer, 2014, p. 8). The increasing demand for educators to transform their classrooms to meet the needs of their learners is not only inevitable, but critical in the development of our global economy (Bell, 2010, p. 39). In support of this critical development of skills for the future, Siu Cheung (2014) states “It is foreseen that in the coming 10 years, the school education sector over the world has to get ready for the creation of digital classrooms which support learners to effectively develop 21st century skills through the day-to-day learning process” (p. 71). For example, educators can often find
themselves in struggling to truly transform their traditional classrooms to supportive 21st-century environments, raising eyebrows in relation to what is known as “Old Wine in New Bottles Syndrome”. According to Anastasia Gouseti, an instructor of education at the University of London, Old Wine in New Bottles Syndrome takes place “where ‘school literacy routines have a new technology tacked on here or there’ without, however, bringing any substantial change to traditional practices” (Gouseti, 2013). Simply adding technology to the same lessons and practices is not sufficient in the development of the 21st century skills.

With schools continuing to encourage educators to move beyond standardized assessment and develop more innovative practices, the incorporation of these skills are essential in preparing learners to be successful not just in the classroom but in their everyday lives. As stated by Laura Hummell, former president of the Children’s Council,

... students who are allowed to explore, empathize, question, hypothesize, conceptualize, experiment, and evaluate throughout their own learning become productive community members. Forming an opinion and being able to rationally and reasonably defend one’s opinions are skills that are keys to being successful. (2016, p. 5)

Significance

The 21st century skills movement centers on developing lifelong learners who are prepared for life and work after graduation. According to Sharon A. Brusic and Korbin L. Shearer, members of the Department of Applied Engineering, Safety and Technology at Millersville University of Pennsylvania, 21st-Century proponents “have been advocating for local, state, and federal policies and support that would enable all schools to better prepare learners to live and work in 21st-century communities” since 2002 (2014, p. 7). Students today need to prepare for becoming members of a global society in which technology and media are
valuable resources (Smaldino, Lowther, & Russell, 2012, p. 21). The importance of this classroom transformation is addressed in the ISTE standards for Educators, which state: “Educators will continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning” (International Society for Technology in Education, 2000, standard 1). This study will be significant because it will not only help to provide educators with detailed definitions regarding each 21st century skill, but will also provide them with examples that they can use to transform their classroom into an environment that supports the development of 21st century skills while providing them with multiple resources to do so.

**Definition of Terms**

**Communication:** The exchange of information that primarily focuses on writing and composition including grammar and punctuation, as well as oral speech (Breslow, 2015, pp. 423-424).

**Collaboration:** The use of communicative skills to accomplish a common goal through productive communication, respect for others, and teamwork while generating ideas together (Bell, 2010, p. 41).

**Creativity:** A process and/or a product, and is generally thought of as the production of useful solutions to problems, or novel and effective ideas (Amabile, 1996, as referenced in Henriksen et al., 2016, p. 28).
**Critical thinking:** Problem solving where students are able to move beyond lower-order thinking and engage in much deeper and applicable thought which can be applied to the real world (Saavedra & Opfer, 2012, p. 10).

**Web 2.0:** The internet platform that moves beyond providing information, and gives users a participatory platform to communicate and interact (Funk, 2009, pp. 48-51).

**21st century skills:** The implementation of communication, collaboration, creativity, and critical thinking in learning (Saavedra & Opfer, 2012, p. 10).

**4 C’s:** The four skills referred to interchangeably with 21st century skills, including communication, collaboration, creativity, and critical thinking.

**Summary**

This portfolio will benefit both educators and learners as it focuses on student achievement in the classroom through the implementation of 21st century skills. By developing a 21st century skills curriculum it will not only provide learners with the opportunities to prepare necessary skills for success in their careers, but will also help educators transform their teaching from masking old teaching practices with technology, to truly dynamic practices. Chapter 2 will contain a literature review that focuses on 21st century skills and the importance of teaching them in classrooms around the world. Chapter 3 will describe in detail the proposed projects which will collectively create a 21st century skills curriculum for educators.
Chapter 2: Literature Review

Introduction

The focus of this literature review will be defining the four components of 21st century skills, while addressing three major concerns regarding how to incorporate these skills into mainstream classrooms: student authenticity, educator best practices, and social development. This chapter attempts to provide specific definitions and examples of these four skills, while also discussing the challenges of implementing such skills, as well as the current demands for the implementation in K-12 education according to ISTE and TIM, the Technology Integration Matrix.

Methodology

Articles collected for the completion of research were primarily retrieved through EBSCO host as well as Google Scholar and JSTOR. Keywords for collecting researching include: 21st century skills, collaboration, creativity, critical thinking, communication, authenticity, social development, effectiveness, pedagogy, e-learning, literacies, implementation, and assessment. These focuses were chosen to develop a sound database of information that would not only focus on the definitions of 21st century skills, but also different methods of implementation and assessment in schools throughout the world. Because research regarding the topic of 21st century skills is still very much in a developmental phase, the majority of articles were written between 2013 and 2016, with the most dated article written in 2010. Although the articles are fairly recent, many contain references to studies dating back to the 1980s, which provided perspective of the early stages of 21st century skill development, primarily focusing on how these skills are implemented in a traditional classroom setting. Information was also
gathered from the Technology Integration Matrix, a project of the Florida Center for Instructional Technology as well as ISTE, the International Society for Technology in Education.

**Analysis of Literature**

There are multiple theories that are observed within K-12 education in relation to student learning. Behaviorism, which emerged in the 1950s from B. F. Skinner’s scientific studies of observable behavior, provides educators with a learning approach that requires them to base instruction off of what they observe from the learner from direct instruction (Smaldino et al., 2012, pp. 21-22). This theory, which primarily consists of educators utilizing more drill and practice methods in the classroom, focuses on what students are internalizing based on their behavior in class (Smaldino et al., 2012, p. 22). For example, an educator may use a lecture style approach in their instruction and base students understanding on how they respond through oral responses or body language. Because of this, behaviorism has limited application to higher-level thinking skills (p. 22). According to Smaldino et al. (2012) behaviorists simply state that practice strengthens the response to stimulus (p. 22). Thus, behaviorist approaches do not support the development of 21st century skills that are necessary for learners’ future success in society. Essentially, this theory paints the picture of the traditional classroom, where students are introduced to new materials and expected to digest that material through practices such as memorization and regurgitating information as a form of mastery.

Cognitivism, which incorporates deeper skill development than the behaviorist approach, requires learners to rehearse material until it moves from short-term memory storage to long term memory storage. According to the work of psychologist Jean Piaget in 1977 (Smaldino et al., 2012), “Cognitivism explores the mental processes individuals use in responding to their
environment- that is, how people think, solve problems, and make decisions.” (p. 22).

Essentially, learners are rehearsing information until it is stored into long-term memory, thus providing them with the skills to deal with more complex scenarios in the future (Smaldino et al., 2012, p. 22). While this theory provides learners with a more in-depth approach to their learning, it does not fully develop 21st century skills that are essential for life post-graduation. As stated in Smaldino et al. (2012):

Many would suggest that the cognitivist approach to instruction is a good compromise between required benchmarks, those standards against which students tested, and metacognition, thinking about one’s own learning. (p. 22)

The constructivist theory, a more recent movement that moves beyond behaviorism and cognitivism, aligns well with 21st century skills as it seeks to provide learners with opportunities to take control of their own learning and develop more personal skills. According to Smaldino et al. (2012):

Constructivists emphasize that learners create their own interpretations of the world of information. They argue that students situate the learning experience within their own experiences and that the goal of instruction is not to teach information but to create conditions in which students can interpret information for their own understanding. (p. 22)

Constructivist classrooms parallel 21st-century classrooms as they are looking to develop students’ skills to think critically and solve real-world issues in the classroom.

Although there has been much deliberation on what skills technically qualify as “21st century skills”, the four primary skills that the 21st-century focuses on are: communication, critical thinking, collaboration, and creativity (Brusic & Shearer, 2014, p. 7). The researchers stated that these four skills have become the focal point of educational development in the past 2 decades, and have created a surging demand for educators to re-evaluate their practices and
transform their classrooms into learner-centric, self-directed learning spaces that provide learners with individualistic approaches to their learning. 21st century skills have been categorized into three domains of competence: cognitive, intrapersonal, and interpersonal (Hilton, 2015).

The cognitive domain involves reasoning and memory; the intrapersonal domain includes the capacity to manage one’s behavior and emotions to achieve one’s goals; and the interpersonal domain which involves expressing ideas and interpreting and responding to messages from others. (p. 64)

These three domains establish the basic principles of 21st century skills not only focus on the learner’s ability to learn new information, but to take that information and apply it to real-life situations where they can incorporate their own creativity and work with others to accomplish a common goal. The focus on 21st century skills in schools across the globe are an effort to better prepare students not only become better employees and consumers in the future, but also better citizens (Brusic & Shearer, 2014, p. 7). According to ISTE, “Educators should inspire students to positively contribute to and responsibly participate in the digital world.” (International Society for Technology in Education. (2000), standard 3).

The promotion of these skills has led to the joined partnerships schools, companies, and communities. The combined efforts of these groups are known as Partnership for 21st Century Skills, also known as P21 (Brusic & Shearer, 2014, p. 7).

According to Sharon A. Brusic and Korbin L. Scheerer (2014):

This effort aims to link core subjects with new content or themes that are often underrepresented in schools, including global awareness, financial, economic, business, and entrepreneurial literacy, civic literacy, health and wellness awareness, and environmental literacy. It also emphasizes life and career skills, learning and innovation skills, and information, media, and technology skills. (p. 7)

The efforts of these schools and communities to increase the skills of today’s youth have led to a global demand for schools to develop new content or themes, all the while incorporating
them into their mainstream courses. The four themes listed below seek to specifically define each 21st century skill, as well as provide examples to how these can be implemented in the classroom. Within each theme, the challenges of implementing such skills are also provided.

**Communication.** Communication skills in the 21st century look significantly different than they did before the introduction to social media, cellular phones, and the transformation of Web 2.0. Communication takes on many forms that primarily focus on writing and composition including grammar and punctuation (Breslow, 2015, p. 423). However, communication skills have significantly changed since the booming development of new technologies.

According to Kurt F. Geisinger (2016):

> The curricula of the last century could not have anticipated the rapid advancement of cellular technology, capacity, and proliferation across the world community, or that the Internet would make global communications virtually instantaneous as well as inexpensive. (p. 246)

Shifting students learning and thinking also relies on shifting their styles and forms of communication as well. Learners today not only have knowledge at their fingertips with technology, but their forms of communication are changing dramatically with instant access and growing social media platforms. Thus, it becomes a task of educators to develop courses in communication. As suggested by Lori Breslow, a Sloan School of Management professor from MIT, “Courses in communication can also be about the forms and effects of web based communication, particularly social media” (2015, p. 424).

Because there has been such a significant increase in the amount of available technologies throughout society, there are new adaptations that need to be made in the efforts of communication development amongst learners. Communication, however, does not just fall on the English/Language Arts educators. Developing communication skills in learners carries
responsibilities for all educators, regardless of content area, in order to provide learners with the opportunity to develop communication skills that move beyond grammar and punctuation.

Critical thinking. Critical thinking is listed as one of the four 21st century skills, but what exactly does critical thinking mean, and what does it look like? Critical thinking, often referred to as problem solving, is when learners are able to move beyond lower-order thinking and engage in much deeper and applicable thought which can be applied to the real world (Saavedra & Opfer, 2012, p. 10). This higher-order level of thinking naturally demands that educators transform their teaching to help develop learners’ ability to take their learning into their own hands. Part of developing critical thinking skills is to teach learners how to learn on their own (Saavedra & Opfer, 2012, p. 10). One solution that educators have found to incorporating higher-order thinking skills is the flipped instruction model, which comprises of educators developing curriculum where learners can read content or watch lectures at home, and use class time to pose thought-provoking questions and create more relatable scenarios to students’ lives in the classroom. Though one example of many, the flipped instruction model is an example of how educators can transform their classrooms to provide more enriching and elevated thinking skills to develop critical thinking skills for the future. This is not to say that educators lose their place in the classroom, though. Jim Greenlaw (2015), a professor from the University of Ontario, Institute of Technology emphasizes the important role that educators play, even in a highly technological environment.

According to Greenlaw (2015):

Teaching is not simply a matter of turning on a computer or an iPad and setting students loose to solve a problem or to do a project. Because of the increasing challenges created by information overload, educators still need to provide direct instruction about the patterns students may need to consider, the historical
background of a problem, or the theoretical perspectives that might help the students to make sense of the information they are gathering and interpreting. (p. 897)

Creativity. According to Anna Rosefsky Saavedra, an associate policy research at RAND education and V. Darleen Opfer, direction of RAND education (2012), “Creativity is prized in the economic, civic, and global spheres because it sparks innovations that can create jobs, address challenges, and motivate social and individual progress” (p. 12). Teaching learners how to recognize their creative abilities and their capacity to develop themselves is the responsibility of the 21st-century educator. It can open doors for students when they embark upon their professional endeavors (Saavedra & Opfer, 2012, p. 12). Why such emphasis has been placed on the rejuvenation of creativity in the classroom can be attributed to the development of standardized testing the classroom. Because standardized testing has pushed educators to “drill and practice” tendencies, the ability for students to become more creative with their learning has been limited (Henriksen et al., 2016, p. 28). By encouraging the increased incorporation of creativity in the classroom, students will be able to unleash ideas and solutions to real world problems which can enhance their ability to contribute to society as adults.

Collaboration. Perhaps the one 21st century skill that seems most versatile and vital of them all is collaboration. The ability of learners to work together and collaborate with one another to accomplish a goal not only enhances the learner’s ability to socially connect with others, but also learn the importance of teamwork and shared responsibilities. Collaboration encompasses all three of the previous skills, for learners are required to use their communicative skills to accomplish a common goal, move beyond low-level thinking skills where the result does not necessarily have a definitive answer, and to appreciate others creativity as well as their own in order to accomplish a task. Through collaboration, “students learn the fundamental skills of
productive communication, respect for others, and teamwork while generating ideas together” (Bell, 2010, p. 41). With progress in technology, learners are not only able to collaborate face-to-face with learners in their classroom, but are also able to connect with learners around the globe that they otherwise would not have the ability to connect with. One of the most important aspects to successful collaboration amongst learners is the amount of accountability that it brings. Stephanie Bell, an elementary educator in New York and doctoral student of Instructional Leadership at Western Connecticut State University claimed the following (2010):

> When students work collaboratively, there is an expectation that each child will contribute to the project equally. The group dynamic creates an interdependent team in which students must each do their part, and as a result, a natural consequence exists for those students who do not demonstrate accountability—others may no longer want to be paired with students who do not do their fair share. Therefore, peer pressure contributes to the accomplishment of ongoing group tasks throughout the learning process and the culmination of a successful final product. (p. 40)

When learners are held accountable for their work, knowing that the success of the group relies on their contributions, the level of motivation thus increase and provides learners with the opportunity to contribute their own thoughts and ideas to a project or task. According to Smaldino et al. (2012):

> By using collaborative learning tools such as classroom blogs, wikis, social networking resources, and learning management systems, [educators] can help 21st-century learners move through the various levels of learning appropriate to their goals, the state learning standards, and expected outcomes. (p. 25)

The Technology Integration Matrix (TIM), a project developed for the Florida Center for Instructional Technology, lists five levels of collaboration: entry level, adoption level, adaption level, infusion level, transformation level. Within these levels, educators should aim to transform student collaboration skills from the individual student’s ability to use collaboration tools, to the
student being able to collaborate with peers and outside resources in ways not possible without technology (The Technology Integration Matrix (2005-2017).

**Concerns Regarding 21st Century Skills**

One common concern regarding the emphasis of 21st century skills in the classroom is the adaptation of educators to a new style of teaching. ‘Old Wine in New Bottles Syndrome’ refers to the implementation of technology, without transforming the teaching practice (Gouseti, 2013, p. 571). Many educators find that replacing their current lesson plans or curriculum with a technology, rather than paper and pencil, is a form of being innovative. The concern then becomes, how do educators best prepare to provide learners with opportunities to enhance their 21st-century learning, when they themselves cannot? Regarding this concern, there are five major principles that have been established that can not only help to guide educators in their quest for transformation, but also can set many nervous minds at ease as far as the steep learning curve that many educators may feel regarding 21st century skills (Karchmer-Klein & Shinas, 2012, p. 289). These principles, developed by Rachel Karchmer-Klein, an associate professor in the School of Education at the University of Delaware, Newark and Valerie Hawlow Shinas, a doctoral student in literacy education at the University of Delaware Newark in 2012, serve as a guide for educators who are looking to enhance their 21st-century teaching practices.

The first principle, Keep Your Eye on the Moving Target, stresses the importance of responding and adjusting your teaching to emerging technologies. While it is nearly impossible to keep up with new technologies that emerge almost daily, they recommend that educators simply do their best to keep up with any new tools that may present themselves and be useful to their classroom (Karchmer-Klein & Shinas, 2012, p. 289). The second principle, Recognize the
Complexity of New Literacies, recommends that educators not only take time to teach the importance of giving credit to traditionally printed text, but also teaching learners how to properly give credit to electronic sources, multimedia sources, and more (Karchmer-Klein & Shinas, 2012, p. 290). The third principle, Digital Natives Still Have a Lot to Learn, reminds educators that while most 21st-century learners enter the classroom with sound knowledge of technologies, often times they still need to be taught how to use them responsibly and appropriately, and educators should never assume that learners understand how to use a certain technology or what tools they should be using (Karchmer-Klein & Shinas, 2012, p. 291). The fourth principle, Reconsider Assessment Methods, suggests that educators adjust their traditional assessment practices to meet the needs of 21st century skills (Karchmer-Klein & Shinas, 2012, pp. 291-292). The final principle, Blending the Old and the New, is one that will likely resonate with most educators, and that is to emphasize that not everything needs to be one way or the other (Karchmer-Klein & Shinas, 2012, p. 292). It serves as a good reminder that educators are not being asked to throw away all previous forms of teaching. Incorporating 21st century skills requires balance from educators, and remembering that not all teaching must be completely digital, or technologically focused, does not take away from the enhancement of 21st century skills. Many of these skills can still be enhanced with more traditional practices, but it is the responsibility of the educator to find ways to incorporate those skills into their practice.
Table 2.1


<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
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<tbody>
<tr>
<td>Keep Your Eye on the Moving Target</td>
<td>Be mindful of the evolution of new technologies as they emerge. Educators should focus on their own professional development with technology.</td>
</tr>
<tr>
<td>Recognize the Complexity of New Literacies</td>
<td>As writers, learn the basics of how to utilize different medias, and continue to differentiate instruction with online and print materials.</td>
</tr>
<tr>
<td>Digital Natives Still Have a Lot to Learn</td>
<td>Educators should suspend assumptions that all students have technological knowledge. Develop instruction designed to address goals and individual needs.</td>
</tr>
<tr>
<td>Reconsider Assessment Methods</td>
<td>Provide students with lessons targeted to areas in need of improvement, and develop assessments that evaluate how students use the technology to present thoughtful and articulate responses.</td>
</tr>
<tr>
<td>Blending the Old and the New</td>
<td>Educators should not concern themselves with traditional practices being completely eliminated. When well taught, new literacies can support and extend students’ abilities to read and write for real purposes.</td>
</tr>
</tbody>
</table>

Part of the responsibility of educators who find themselves in this position is to work with their colleagues to improve their teaching skills in order to transform their classroom. In order to do so, educators can participate in activities such as joint learning projects, topical discussion groups, online courses, or mentoring programs (Smaldino et al., 2012, p. 27). One important perspective for educators to keep in mind is that 21st century skills are not one size fits all. Educators need to decide what theory best suits the particular lesson and recognize that different theories may be applicable in different situations in order to develop a positive outlook on the implementation of 21st century skills in their classrooms (Smaldino et al., 2012, p. 23).

Because there is such emphasis on technology in education today, there is a growing concern regarding learner ability to interact face-to-face with others, especially when in the
workforce. Another concern regarding social development is that, if learners are developing these through technology, what about students around the globe who do not have access to these types of technologies? What sort of experiences or skill developments are they missing out on? While the increased amount of screen time and decreased amount of face-to-face interaction can be frightening for many, the ability for learners to communicate with each other in the classroom does not necessarily need to be done away with. As stated previously, educators who are able to find balance within their classrooms to not only provide learners time to work using technology, but also alongside each other, these important social skills can still be developed (Karchmer-Klein & Shinas, 2012, p. 289). In classrooms where there is no face-to-face interaction, collaborative resources such as Google Hangouts, FaceTime, Skype, and more, provide learners with the ability to connect with others even when in a completely digital setting.

There is also concern regarding learner authenticity and contribution to 21st-century work, especially in relation to providing appropriate credit when due, and contribution to collaborative efforts without skating by for the grade. As discussed previously, 21st-century learning not only emphasizes the amount of learner accountability due to peer pressure, but it also presents a new level of motivation for learners to contribute when they are able to present their own creative ideas and interests into their learning (Karchmer-Klein & Shinas, 2012, p. 289).

**Gaps in Research**

Since data collection and analysis on 21st-century skills in the classroom is still taking place, the amount of valid data collected is still continuing to grow as new technologies are emerging on a consistent basis. The amount of research that has been collected on the subject is
still in a developing stage, with limited amounts of analytical data demonstrating the successful implementation of 21\textsuperscript{st} century skills in the classroom. A second gap in research is the amount of technology or implementation that takes place in schools across the country. Although efforts are being made to promote school leaders to recognize the importance of incorporating 21\textsuperscript{st} century skills into their schools, the amount of emphasis on 21\textsuperscript{st} century skills and e-learning integration ranges throughout K-12 schools (Siu Cheung et al., 2014, pp. 73-74). A third gap in research is the amount of technology that schools have available to them. Because many schools implement multiple forms of technology, including 1:1 device initiatives, bring your own technology initiatives, computer labs, devices carts, and more, it presents a challenge for producing evidence of the successes regarding the types of technologies that are being utilized in schools.

**Conclusion**

With the emergence of new technologies rapidly increasing in schools, the demand for a shift in teaching practices to incorporate 21\textsuperscript{st} century skills are inevitable. In order for today’s learners to be successful global citizens and future consumers, emphasis on developing 21\textsuperscript{st} century skills are critical for their future success. The ability for learners to develop strong communication skills, critically think, incorporate their own creative ideas, and collaborate with peers will determine their success not only as learners, but also as functioning adults in an ever-changing global society (Smaldino et al., 2012, p. 21). Although there are many concerns regarding the authenticity of student work, the proper development of social skills, and the ability for the educator for properly teach these skills, 21\textsuperscript{st} century skills naturally integrate together to develop well-rounded learners in an increasingly technological society.
The following chapter will include a description of the products to be created for this portfolio, as well as objectives for the targeted audience of the project.
Chapter 3: Description of Products

Introduction

Chapter 2 examined the significance and importance of teaching 21st century skills in the classroom for learners throughout the world. While discussing some of the critical issues in the implementation of 21st century skills, chapter two discussed how these concerns can be addressed for today’s educators. The purpose of this chapter is to introduce the products which will provide educators with resources to transform their classrooms into environments in which learners can develop 21st century skills.

Description of Products

The products to be created for this portfolio include the following: an authored course discussing and demonstrating best practices regarding 21st century skills in the classroom, and a reference document created via Google Sheets for educators to utilize when transitioning their own teaching practices to incorporate 21st century skills curriculum in their classroom. Collectively, these products seek to develop a 21st century skills curriculum that is suitable for all levels in K-12 education.

The problem addressed in this portfolio is to increase authentic student work and social skill development through the use of technology, while transforming the teaching practices of the educators teaching 21st century skills. The goal of this project is to encourage educators in today’s K-12 settings to incorporate a consistent use of technology while emphasizing the importance of 21st-century learning. Upon completion of these portfolio projects, the following objectives will be satisfied as they are applicable to each of the three products included in the portfolio:
• Educators will be able to identify the four core 21st century skills, as well as define them using specific examples that can be applied in the classroom.

• Educators will gain insight into tools that meet the needs of their classroom, with a specific emphasis on the use of Google Drive amongst other Google tools which especially promote collaboration and communication.

• Educators will be able to identify specific programs and/or learning tools that will increase student engagement opportunities and authentic experiences.

**Audience Analysis**

The audience for this portfolio will be educators in K-12 settings who are working in classroom settings which incorporate new technologies for learners. Audience members should be familiar with the general implementation of technology in the classroom. This will include, but is not limited to, the individual use of the following: iPads, Chromebooks, learning pads, or laptop computers. Audience members should have some experience utilizing these tools in their classrooms whether it is through 1:1 implementation, the use of computer labs, or through shared carts. This portfolio seeks to provide education and training for those utilizing these tools in their classroom environment. The audience motivation behind this project is for educators to transform their teaching to meet the high demand of the implementation of 21st century skills in today’s classrooms. Educators should have a basic understanding of 21st century skills, including: collaboration, creativity, communication, and critical thinking (Brusic & Searer, 2014, p. 7). The audience members do not require previous knowledge of the use of Google Drive, though it will be helpful in their future endeavors following the course. Level one Google training may be needed outside of completion of the projects.
Teaching 21st Century Skills Course

**Product.** This product will include a newly developed training module which focuses on best practices for implementing 21st century skills in K-12 classrooms. The focus on the product will include how to transform teaching with technology, rather than utilize technology merely as a replacement for more traditional practices. The media that will be used for the Teaching 21st Century Skills course will be developed using UDUTU, a course authoring program. Using UDUTU will allow development to include interactive components such as matching portions, quizzes, screencasts, videos, and audio.

**Content.** The content to be included in the course will include an introductory page describing how to navigate UDUTU. Following navigation, the objectives of the course will be included. The course will then include six main portions. The first portion will establish the importance and need for 21st century skills in K-12 classrooms. The second portion of the program will provide a brief history of learning theories in K-12 classrooms. This portion of the course will provide definitions and concrete examples of the “4 C’s” used referenced with 21st century skills. Following the definitions and examples, there will be an assessment to determine the comprehension of the four skills. The final portion of the course will provide teachers with reflection time on the four C’s, and will refer them to the Schoology course built for the 4 C’s initiative in the Albany School District. The content for this project will be based off of the ISTE (International Society for Technology in Education) standards for educators.

**Process.** The course will be created through UDUTU. Throughout the development stage of the course, consultations between Albany staff as well as my advisor will be completed. Following these consultations, any necessary changes to project or updates will be completed.
**Relationship.** Coursework and classroom designs at Albany Middle School have seen drastic changes within the last 2 years, and will continue next year with brand new facilities, devices, and media center. There is an increasing demand for learners to utilize their Google Drive at school due to 1:1 device implementation at all grade levels, as well as use their devices to enhance their 21st century skills. There are concerns amongst staff regarding learner authenticity and social development with the increase in technology. This course will seek to educate educators about the possibilities of incorporating 21st century skills in their classrooms, and how they can correlate their teaching practices with the new transitions of the middle school. This project will help to connect the increasing changes within the school to the social demands of today’s learners possessing 21st century skills in the workforce.

**Websites and Applications Google Sheet**

**Product.** This product will be newly developed a reference manual for educators to utilize throughout their 21st-century implementation that will serve as a troubleshooting guide as well as a reference during their teaching transitions. This manual will be tangible for educators and will not require full training like the 21st Century Skills course. This manual will be available for educators to reference at any point, and will be accessible digitally. In order to do so, the reference manual will be developed utilizing Google Docs, as this allows it to be easily embedded into multiple programs, as well as accessed

**Content.** The content for this project will be based off of the ISTE (International Society for Technology in Education) standards for educators. The content to be included in this manual will include troubleshooting tips, ISTE standards that align with 21st century skills incorporation,
Google Drive help, and other resources that can help to answer specific questions they may have regarding their teaching practices.

**Process.** The reference manual will be developed after interviewing educators throughout Albany Middle School who have questions or concerns regarding utilizing 1:1 devices in class. Following these interviews, a reference manual will be developed to answer specific questions they may have regarding different ways to implement 1:1 devices in their classrooms, as well as help towards issues that they have experienced throughout the past year with the new initiative.

**Relationship.** This reference manual will help to serve as a supportive tool that educators can reference at any point following the completion of the Teaching 21st Century Skills course.

**Application of Products**

These products apply to my career objectives because I would like to serve as a technology integrationist in a K-12 setting. I feel that 21st century skills are often underserved, and are passed over as a “buzzword” rather than a philosophical change. I believe that these projects collectively will help emphasize the importance of 21st century skills development in order for learners to not only be successful throughout their time in elementary and secondary school, but also in their career choices beyond graduation. This curriculum will promote educator awareness to the demand of 21st century skills teaching, as well as risk-taking in teaching approaches to meet the needs of today’s learners.

**Data Needed**

Student and personal data will be collected beginning in December 2017 from staff in the Albany Area School District. The data collected will regard how often educators utilize programs and applications that enhance 21st century skills, and how educators feel that they are
transforming their practices. Data will be collected through the use of anonymous surveying utilizing Google Forms. Data will also be collected via BrightBytes, which is a survey conducted annually throughout the Albany district to examine both educator and student use of technology and how those skills are applied in the classroom on a daily basis.

**Application of Products**

The products included in this project have been designed to assist educators in K-12 classrooms to transform their current methods of teaching to incorporate 21st century skills in order to best prepare learners for their future careers. The Google Sheets reference manual will provide educators with a vast amount of resources and references that they can access during this transition.

**Timeline**

**November 2017**

- Culminating project committee members agree to participate

**December 2017**

- Culminating project preliminary meeting with committee members

**January-March 2018**

- Project production and completion
- Remain in contact with committee members about project completion

**April 2018**

- Culminating project completed

**May 2018**

- Final meeting with committee members
• Oral and written exit interview with the Information Media department
• Graduation

Summary

Both products are designed to support educator transformation to develop learners’ 21st century skills in K-12 classrooms. The completion of the authored course, paired with the Google Sheet of technology resources, will provide K-12 educators with a 21st century skills resource that they can implement in their classroom at their discretion. In the following chapter, you will find a complete description of the two products that will be produced, as well as the description of how to implement those products in a K-12 classroom setting.
Chapter 4: Tangible Products

Introduction

There are two projects that make up for the contents of chapter four. The first project is a UDUTU training course developed for teachers in the Albany Area Schools District for the 4 C’s Schoology courses that will be implemented in the fall of the 2018-2019 school year. As a part of the school board’s innovation district goals, the 4 C’s courses will be offered to staff as an option for obtaining continuing education credits. This training course is meant to serve all staff members who wish to participate in the Schoology courses that will be offered as an introduction to 21st century skills, and draw attention to which of the 4 C’s they feel they need the most training in.

The second project is a Google Sheet that provides 40 websites and applications, which can continuously be added to/edited, that teachers can use to develop lesson plans regarding the 4 C’s. Each website/application lists a short description of what the purpose of the website/application is, what sort of platform they are available on, whether or not they are free or paid subscriptions, and which of the 4 C’s they best target. The Google Sheet was developed in collaboration with the district’s Technology Integrationist, Aileen Swenson, over the summer during my Technology Integration internship. The final versions of these of two projects are showcased within this chapter.

Product I-UDUTU Course


This course is segmented into seven different self-paced segments with narrations. The first segment serves as an introduction to the course. Here, the learners will learn how to utilize
the tool bar in the top right-hand corner of the screen, what the objectives of the course are, and an overview of the information that they are going to learn throughout the course. The second segment of the course discusses the evolution of learning theories, highlighting the following learning theories: behaviorism, cognitivism, and constructivism. Following those segments, the next four specifically discuss each of the 4 C’s. Within each of these segments, the 21st century skill is broken down by definition and specific skills that are observed in the classroom, followed by an assessment and applicable websites and apps that the teacher can use in their classroom to enhance those skills.

Slide 1: Introduction to course

Overview of toolbar: exit, navigation, glossary, refresh, back and next.

Narration: Welcome to the 21st century skills in the classroom: 4 c’s training course. Throughout this course we will discuss definitions of the four c’s, breakdown the different interpretations of each skill, and provide examples of how each of these skills can be applied to your class.

Should you need to reference a previous page throughout the course, or should you get lost, please refer to the “Navigate” button in the upper right-hand corner of your screen.

The glossary is available to you throughout the course if you would like to reference any definitions or terms.

Should the page experience any technical difficulties, please click the “refresh” button, located next to the glossary icon at the top of your screen.

You may return to a previous screen by clicking the “back” icon, and advance to the next screen by clicking the “next” icon.

To exit the program at any point, please hit the X icon, titled exit, at the top of your screen.
Slide 2: Recognition of the NEA

Specific aspects of each of the 4 C’s throughout this course can be found in the National Education Associations Educator’s Guide to the 4 C’s. A link to the guide will be provided at the conclusion of the course. The guide provides specific rubrics for individual content areas that you may find helpful in your evaluation of your own teaching practices.

Slide 3: Learning outcomes

Narration: After participating in this course, learners should be able to:

- Identify the 4 C’s of 21st Century Learning
- Define communication, collaboration, critical thinking, and creativity
- Evaluate the strengths and weaknesses of their own implementation of the 4 C’s
- Create a lesson plan implementing one of the four C’s that can be utilized in their classroom

Slide 4: What are the 4 C’s?

Narration: To begin, let’s discuss what the 4 C’s include. 21st century skills, by definition, include the implementation of communication, collaboration, creativity, and critical thinking in learning. These four skills have increasingly been emphasized in 21st century classrooms in an effort to develop necessary skills for student success outside of the classroom and in the working world.
Slide 5: Importance of the 4 C’s

Narration: So why are the four C’s so important? With schools continuing to encourage educators to move beyond standardized assessment and develop more innovative practices, the incorporation of these skills are essential in preparing learners to be successful not just in the classroom but in their everyday lives. Laura Hummell, former president of the Children’s Council, states that students who are allowed to explore, empathize, question, hypothesize, conceptualize, experiment, and evaluate throughout their own learning become productive community members. Forming an opinion and being able to rationally and reasonably defend one’s opinions are skills that are keys to being successful. These skills are becoming increasingly necessary for student success in society every day.

Slide 6: The Four C’s

Narration: It is important to recognize that the four C’s, communication, collaboration, creativity, and critical thinking, go hand in hand. For students, many of these skills can be practiced within one project. For example, communication is an essential function to successful collaboration with their peers. As an educator, remember that failure can often be a positive experience for both yourself and your students. Learning how to reflect and change upon what you have implemented is essential, and provides students with a learning experience that success often comes from early failures. Don’t be afraid to take risks!

Slide 7: Assessment

Identification of the correct terms associated with the 4 C’s
Slide 8: Learning theories

First, let’s take a look at learning theories that have developed over the past sixty years. The three learning theories that we will discuss are behaviorism, cognitivism, and constructivism. All learning theories can be observed in classrooms across the country and around the world today.

Slide 9: Behaviorism

Behaviorism, a learning theory developed by B.F. Skinner in the 1950s, primarily focuses on drill and practice in the classroom. Often through lecture, behaviorism recognizes the teacher providing students with information with the expectation that students will then memorize that information.

Slide 10: Behaviorism (contd)

Narration: As stated earlier, behaviorism often observes teachers lecturing in a traditional manner in front of students, often requiring that students take notes or practice problems delivered by the teacher. This learning theory focuses on memorization of the information and the ability to regurgitate that information in the future. In relation to 21st century skills, behaviorism significantly lacks in ability to develop 21st century skills. With students unable to take control of their own learning, and not being provided higher-level thinking skills, behaviorism does not develop the essential 21st century skills that students need in order to be successful in the developing world.
Slide 11: Cognitivism

Narration: The next learning theory that we will discuss is cognitivism. A learning theory develop by Jean Piaget in 1977, cognitivism focuses on students’ ability to rehearse information, and through repetition and practice retain that information by transferring it from short term memory to long term memory.

Slide 12: Cognitivism (contd)

Narration: Focusing on repetition, and storing information in long-term memory, cognitivism seeks to develop critical thinking skills and problem solving. By providing students with a higher level of thinking, cognitivism helps students deal with more complex scenarios that they would likely deal with in their real-lives. While cognitivism does develop critical thinking skills, as a learning theory it does not fully develop students 21st century skills.

Slide 13: Constructivism

Narration: The learning theory that best enhances 21st century skills is constructivism. Constructivism observes three domains: cognitive, intrapersonal and interpersonal. The cognitive domain involves reasoning and memory, the intrapersonal domain includes the capacity to manage one’s behavior and emotions to achieve one’s goals, and the interpersonal domain involves expressing ideas and interpreting and responding to messages from others. Collectively, these three domains in combination with the 4 C’s determine one’s ability to effectively function not only as an employee but also as a global citizen.
Slide 14: Constructivism (contd)

Narration: The constructivist learning theory helps to develop 21st century skills by giving learners an opportunity to incorporate their own creativity and abilities in their learning. Not only do the three domains previously discussed focus on the learner’s ability to learn new information, but to apply that information to real life where they are able to make personal connections and think critically to develop real-world perspectives.

Slide 15: Finding balance

Narration: Ultimately, the three learning theories discussed are all applicable to classrooms today, as long as the teacher is able to find balance. It is important to remember that traditional teaching practices are not a bad thing. Traditional practices do have value. However, it is important as educators to continuously look at what today’s learners specifically need, and work to better our own practices to meet those needs. Remember that change is not necessarily a bad thing and you may be surprised at how many 21st century practices you may already be implementing without even knowing. Find what works for you in your classroom, and keep an open mind to new practices.

Slide 16: Old Wine in New Bottles Syndrome

Narration: While learning new practices, it is important to be mindful of what is known as Old Wine in New Bottles syndrome. Old Wine in New Bottles syndrome refers to teachers replacing traditional practices with technology, without transforming any of the practices themselves. An example of this would be taking a worksheet that was previously conducted on paper, developing an electronic version, and posting it on a learning management system. In doing so, there is no transformation of the teaching practice itself. It is merely replacing former teaching practices with technology. Be mindful of this when developing new lessons or materials, or when recreating lessons previously taught.
Slide 17: Assessment

Learners will be prompted to match the learning theories with their corresponding descriptions.

Slide 18: Communication introduction

Narration: Let’s begin discussing communication. Following the communication module, you will be requested to reflect upon your own teaching practices, and will complete the reflective assessment before moving forward to the next skill.

Slide 19: Definition of communication

Narration: By definition, communication is the exchange of information that primarily focuses on writing and composition including grammar and punctuation, as well as oral speech. Student’s ability to communicate effectively and confidently in the adult world is an essential skill in the 21st century.
Slide 20: Comfortability

Narration: The first essential component of communication is comfortability when speaking. Speaking comfortably refers to the ability to communicate for a wide array of purposes with confidence and determination. Whether in conversation with another person or small group, or in front of a crowd, a student’s ability to speak with confidence to convey important information is essential in effective communication.

Slide 21: Different media platforms

Narration: Next, communication in different media platforms is especially important with today’s evolving technology. Being able to communicate important information in person, via phone, and through digital media are essential forms of effective communication. An important piece of communicating in a different digital platform is communicating thoughts and opinions responsibly. When utilizing social media in the classroom, it is important to discuss digital citizenship, and thinking before posting.

Slide 22: Effective listening

Narration: Just as important as speaking, effective listening is essential to developing proper communication skills. In a digital sense, effective listening may involve students’ ability to thoroughly read information and interpret the writer’s opinion or voice. In person, effective listening involves making proper eye contact, not interrupting the speaker, engaging in conversation, and providing feedback when appropriate.
Slide 23: Clear communication

Narration: Clear communication involves the ability to speak with control, articulate thoughts, and utilize effective nonverbal skills. Nonverbal skills include body language such as posture, eye contact, smiling, nodding, arm and hand positions, and more. Speaking clearly and articulating information, perspectives, and opinions help students to develop the skills necessary to communicate effectively in society.

Slide 24: Diverse environments

Narration: One of the more significant challenges in effective communication is the ability to speak in diverse environments, especially if the learner is fluent in only one language. However, there are many technological tools available today that can assist learners in their ability to speak in diverse environments. Outside of using technology to translate, body language again plays a key role in communicating effectively on a global scale. Nonverbal communication, as discussed previously, can help to communicate opinions and information in multicultural and multilingual environments. One of the great benefits of technology today is that it presents opportunities for learners to connect with students around the globe and develop these skills prior to entering the working world. For example, a student can Skype with a student from another country and learn about their culture and forms of communication to better understand others.
Slide 25: Assessment

Learners will be prompted to match the different aspects of communications with their corresponding descriptions.

Slide 26: Classroom implementation

Narration: The following are links to recommended sites and applications that can enhance communication skills in your classroom. Right click on the links below to open them in a new tab or window, and explore what options may best suit your lessons. For more detailed explanations of the following sites and applications, please refer to the 4 C’s Google Sheet.

Slide 27: Collaboration introduction

Narration: Next, let’s begin discussing collaboration. Following the collaboration module, you will be requested to reflect upon your own teaching practices, and will complete the reflective assessment before moving forward to the next skill.
### Slide 28: Collaboration definition

**Narration:** By definition, collaboration is the use of communication skills to accomplish a common goal through projective communication, respect for others, and teamwork while generating ideas together. A student’s ability to collaborate responsibly and effectively with their peers is an essential skill in the 21st century.

### Slide 29: Working with others

**Narration:** Arguably the most essential component of collaboration is the ability to work with other people. Collaboration centers around a person’s ability to work with one or more persons on a project or task, and share the responsibilities of the task and work towards a common goal. There is an increasing number of technologies that are either incorporating collaboration options or working towards collaborative features. Collaboration focuses at the learner being able to share projects or tasks with others, share opinions, and communicate to complete a task as a team.

### Slide 30: Flexibility

**Narration:** The ability to be flexible and work through struggles or problems on projects is a key component to successful collaboration. A person’s ability to take challenges as they come, and to adjust to new changes is critical for productive collaboration efforts. Oftentimes projects or tasks have unforeseeable events or roadblocks that can make the completion of the project seem impossible. The ability to set aside previous expectations and accept change is what ultimately makes collaborative efforts a success.
Slide 31: Sharing responsibility

Narration: Along with the ability to be flexible with a group, sharing responsibilities for projects is key to making them a success. One of the more significant concerns of implementing 21st century skills and technology in the classroom is how authentic student work on collaborative projects can be. In other words, there is concern on whether or not all teammates on a project are completing their fair share of the work, and not claiming others efforts as their own. While no technology can necessarily guarantee this from happening, emerging technologies are seemingly implementing abilities to evaluate individual work on collaborative efforts, and so long as educators continuously emphasize the importance of sharing responsibilities for projects, students who are given the opportunity to collaborate with their peers on projects will help develop necessary skills that they will use in the future.

Slide 32: Assessment

Learners will be prompted to check the correct responses.

Slide 33: Classroom implementation

The following are links to recommended sites and applications that can enhance collaboration skills in your classroom. Right click on the links below to open them in a new tab or window, and explore what options may best suit your lessons. For more detailed explanations of the following sites and applications, please refer to the 4 C’s Google Sheet.
Slide 34: Critical thinking introduction

Narration: Next, let’s discuss critical thinking. Following the critical thinking module, you will be requested to reflect upon your own teaching practices, and will complete the reflective assessment before moving forward to the next skill.

Slide 35: Critical thinking definition

Narration: By definition, critical thinking is problem solving where students are able to move beyond lower-level thinking and engage in much deeper and applicable thought which can be applied to the real world.

Slide 36: Ability to reason

Narration: One of the most crucial aspects of critical thinking is the ability to reason. Reasoning involves both inductive and deductive reasoning. Inductive reasoning involves looking for trends or patterns and generalizing that information. Deductive reasoning is taking data or facts set and coming up with conclusions based on that information. The ability to reason essentially focuses on a student’s ability to look at information or data and come up with conclusions or hypotheses based on that information. By taking information and coming up with conclusions, whether through inductive or deductive reasoning, students are able to think critically about real-world situations and apply that to their everyday lives.
Slide 37: Comparing evidence

Narration: Another component of critical thinking is the ability to compare evidence. Similar to the ability to reason, comparing evidence is a student’s ability to look at two or more scenarios or sets of information and make comparisons about that information. For example, if a student is required to determine whether something is true or not, their ability to read both sides of the argument or claim and determine the outcome is a way to effectively compare evidence.

Slide 38: Decision making

Narration: Coinciding with reasoning and comparing evidence, decision making is yet another essential function of thinking critically. Part of decision making is the ability to interpret information and draw conclusions based on the evidence or information provided. One important part of teaching decision making for teachers to remember is that students may not always make what would have been the better choice. This is a great learning opportunity for students to better develop their critical thinking skills, and know that failure is a learning opportunity and is not necessarily a bad thing.

Slide 39: Problem solving

Narration: Lastly, let’s look at problem solving as one of the essential skills of critical thinking. Part of problem solving is the ability to identify and ask questions that clarify points of view and lead to better solutions. Problem solving requires a student to interpret information and draw conclusions that best suit the situation at hand. Part of problem solving effectively is a student’s ability to reflect on their own experiences and determine what the best possible solution may be.
Learners will be prompted to select the correct multiple choice response.

The following are links to recommended sites and applications that can enhance critical thinking skills in your classroom. Right click on the links below to open them in a new tab or window, and explore what options may best suit your lessons. For more detailed explanations of the following sites and applications, please refer to the 4 C’s Google Sheet.

Narration: Finally, let’s discuss creativity. Following the creativity module, you will be requested to reflect upon your own teaching practices, and will complete the reflective assessment before moving on to the final reflection portion of the course.
Slide 43: Creativity definition

Narration: By definition, creativity is a process and/or a product, and is generally thought of as the production of useful solutions to problems, or novel and effective ideas. Creativity can be defined in many ways, but it specifically looks at a student’s ability to create new and worthwhile ideas that can be used to improve and maximize creative efforts. Students’ ability to be creative is an essential skill in the 21st century.

Slide 44: Innovation

Narration: Developing creative solutions to real-world problems involves the ability to look at how creative ideas can become tangible. This ultimately relies on innovation as part of creative solutions. Innovation relies on new methods and ideas as part of a product or solution. Part of innovation is viewing failure as an opportunity. Innovation is not a short-term solution. Innovation relies on the ability to fail, often times frequently, and develop plans for success through reflection. Coming up with new and fresh solutions almost guarantees failures along the way.

Slide 45: Blending communication and critical thinking

Narration: Ultimately, creativity is a blending of communication and critical thinking. As stated in the National Education Association’s Guide to the Four C’s, creativity is not only the ability to demonstrate originality and inventiveness in work to understand the real world limits to adopting new ideas, it requires the ability to be open and responsive to new and diverse perspectives. Thus, the four C’s merge together under creativity by including student’s ability to communicate and think critically in order to develop creative work.
Slide 46: Assessment

Learners will be prompted to answer a true or false question.

Slide 47: Classroom implementation

The following are links to recommended sites and applications that can enhance creativity skills in your classroom. Right click on the links below to open them in a new tab or window, and explore what options may best suit your lessons. For more detailed explanations of the following sites and applications, please refer to the 4 C’s Google Sheet.

Slide 48: Additional resources

Narration: For further information regarding the 4 C’s, or standards for both educators and students, please refer to the following links.
Narration: So where do you go from here? Via Schoology, select the 21st century skill of your choosing that you would like to implement in your own classroom. Throughout the course, you will be asked to submit a lesson plan that you would like to revamp using information, apps, websites, or resources provided through this training. You will be able to select from a wide range of scholarly and online journals, participate in staff discussions, and reflect upon your successes as you navigate your way through the 4 C’s. Please contact Aileen Swenson with any further questions regarding the 4 C’s courses conducted on Schoology. Thank you for completing this training course. Good luck to you in your future endeavors with the 4 C’s!


<table>
<thead>
<tr>
<th>About</th>
<th>Platform</th>
<th>4Cs</th>
</tr>
</thead>
<tbody>
<tr>
<td>App/Program Name</td>
<td>Description</td>
<td>Creativity</td>
</tr>
<tr>
<td>AURASMA</td>
<td>Augmented Reality</td>
<td>Collaboration</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>Communication</td>
</tr>
<tr>
<td>epistle</td>
<td>Discover the digital library for kids.</td>
<td>Critical Thinking</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Explain</td>
<td>Turn your white board into an interactive experience from your iPad/tablet</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>FLIPGRID</td>
<td>Students respond to prompts with a short video. Responses can be seen just like a Schoology Classroom discussion</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Yes, more of pay</td>
<td>X</td>
</tr>
<tr>
<td>Glogster (for teachers)</td>
<td>Create unique digital posters with infinite space and multimedia components</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Google Docs</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Google Drawings</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Google Earth</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>App/Program Name</td>
<td>Description</td>
<td>3rd</td>
</tr>
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<tr>
<td><strong>About</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Google Finance</strong></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Google Hangouts:</strong></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Google Slides/Presentations</strong></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>iMovie</strong></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td><strong>Instagram</strong></td>
<td>A simple, fun &amp; creative way to capture, edit &amp; share photos, videos &amp; messages with friends &amp; family.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Kahoot!</strong></td>
<td>Game-based tool to create discussions, quizzes or surveys related to specific topics either for an assessment or for feedback</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Newsela</strong></td>
<td>Share your story, knowledge, and voice with the world by creating digital story books!</td>
<td>Web-Yes App-$2.99</td>
</tr>
<tr>
<td><strong>NEWSELA</strong></td>
<td>News articles with reading levels.</td>
<td>Yes, more ways</td>
</tr>
<tr>
<td><strong>About</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>padlet</strong></td>
<td>Easy way to collaborate with online backboards</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Pilotochart</strong></td>
<td>Easy to use infographic maker</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Note</strong></td>
<td>Capture notes, organize, and share with others</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>PowToon</strong></td>
<td>Make animated videos that look super professional in just a few minutes with PowToon. It's easy.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Prezi</strong></td>
<td>Presentation software that brings your work to life with motion, zoom, and spatial relationships.</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>QR (Quick Response) Codes</strong></td>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Quizlet</strong></td>
<td>Search and create study sets, play study games, create flashcards, and more</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Reedly</strong></td>
<td>Student video responses and discussions.</td>
<td>Yes</td>
</tr>
<tr>
<td>App/Program Name</td>
<td>Description</td>
<td>Platform</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td><strong>remind</strong></td>
<td>Easy student/parent communication</td>
<td><strong>iOS (App)</strong></td>
</tr>
<tr>
<td><strong>Seesaw</strong></td>
<td>Student-driven digital portfolios and simple parent communication</td>
<td><strong>Web-based</strong></td>
</tr>
<tr>
<td><strong>scrible</strong></td>
<td>Save online articles, sites, &amp; research, annotate on screen. Share articles with others.</td>
<td><strong>iOS (App)</strong></td>
</tr>
<tr>
<td><strong>smore</strong></td>
<td>Beautiful and easy to use digital newsletters.</td>
<td><strong>iOS (App)</strong></td>
</tr>
<tr>
<td><strong>Snapchat</strong></td>
<td>Snapchat lets you easily talk with friends, view live stories from around the world, and explore news.</td>
<td><strong>Web-based</strong></td>
</tr>
<tr>
<td><strong>socrative</strong></td>
<td>Engage, assess and personalize your class with formative assessments through quizzes, quick question polls, and real-time polls.</td>
<td><strong>iOS (App)</strong></td>
</tr>
<tr>
<td><strong>Splice</strong></td>
<td>Splice makes it easy to create professional-looking videos on your iPhone® or iPad®.</td>
<td><strong>Web-based</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>App/Program Name</th>
<th>Description</th>
<th>Platform</th>
<th>4Cs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bingo Buddy</strong></td>
<td>Create digital stories. Students can work solo or collaborate.</td>
<td><strong>FREE</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td><strong>Free, educational games. Common Core aligned.</strong></td>
<td><strong>Web-based</strong></td>
<td><strong>X</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td><strong>Twitter</strong></td>
<td>Twitter: Share learning, reflections, and ideas on this social network.</td>
<td><strong>Web-based</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td><strong>Wordle</strong></td>
<td>Create word clouds.</td>
<td><strong>Web-based</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td><strong>WordSalad</strong></td>
<td>WordSalad: Create word clouds.</td>
<td><strong>Web-based</strong></td>
<td><strong>X</strong></td>
</tr>
<tr>
<td><strong>YouTube</strong></td>
<td>Create, upload, and share videos.</td>
<td><strong>Web-based</strong></td>
<td><strong>X</strong></td>
</tr>
</tbody>
</table>
Chapter 5: Reflections

The completion of my two products helped me better understand the professional development opportunities that we have within the Albany district, as well as the desire of our teaching staff to learn more and better their own practices. I was surprised by how many teachers rely on their own research in their spare time to learn more about new practices and technologies that can enhance their own teaching. While I found it slightly disappointing that our staff felt that the district was not meeting their training needs regarding 21st century skills, I was also excited at the opportunity to provide information and knowledge for our staff to help us reach our district wide goals of innovation and 21st-century learning.

After viewing the data collected by the BrightBytes survey completed in 2017, I was happy to see that our school is providing students with adequate internet access and devices. One of the biggest changes that our district has seen in the last five years is the implementation of one-to-one devices. Starting in the senior high, the one-to-one initiative began with a Bring Your Own Device (BYOD) model in grades 9-12, with grades 7-8 sharing carts and computer labs. Within one school year, we were able to implement one-to-one devices for all seventh graders, with the carts only needing to be shared with amongst the eighth grade teachers. Finally, we have reached our goal initiative which was all students 7-12 having a device of their own. With sixth grade students recently joining our school following a massive construction project, our sixth grade classrooms are now sharing the carts that were previously used by 7-8 grade. Following the ladder approach of device distribution, next year every student in the building will have access to a device of their own. With a great opportunity such as this, our district is now in need
of proper training and informational courses regarding 21\textsuperscript{st} century skills for teachers to meet our student needs.

Although my project is still pending board approval for teaching staff to receive continuing education credits, I was very happy with the feedback and results received from fellow staff members. For example, a middle school math instructor made the comment that the applications sheet helped him find ways to incorporate more creative practices in his math class, and inspired him to try more project based approaches in a course that is driven primarily by standard assessments. The head of the music department noted that while he was familiar with the concept of the 4 C’s, he had never realized that students were actually enhancing 21\textsuperscript{st} century skills in his classroom. Specifically, he noted that he felt he was lacking his ability to provide students with authentic scenarios to enhance their critical thinking, but when he was able to break it down to what that actually looks like, he realized he provides students with more opportunities to compare evidence and making decisions in composition and musical pieces than he had originally thought. The feedback that I feel was most significant was in a conversation with a fellow social studies teacher. After viewing the 21\textsuperscript{st} century skills course and the applications sheet, he made the comment that although he felt he had a fairly strong grip of what the 4 C’s are and what they looked like, he was really looking for the more details and specific examples of what each skills entails, and what different resources are available to improve his own practices. In that conversation, he felt that he strongly related to the ‘Old Wine in New Bottles Syndrome’ and that while he felt he was providing students with 21\textsuperscript{st}-century learning opportunities, he was ultimately recreating the same lessons he had taught in previous years, but only replacing the delivery method, not transforming the lesson itself.
The changes that I foresee with the UDUTU course in the future is a more interactive component for teachers to re-assess their lessons. Our technology integrationist for the district will be utilizing the UDUTU course created to provide teachers with an initial introduction to the 4 C’s. The staff participating in this training will then complete their lesson recreation via Schoology, our district’s learning management system. Through this Schoology course, teachers will be able to share their experiences with other staff members and provide concrete examples of lessons specific to each of the 21st century skills that they chose. I will be excited to see how many staff members choose to participate in the initiative, and I am very glad that our school board was supportive of making this an opportunity for teachers to receiving continuing education credits, which will hopefully incentivize teachers who otherwise would not have had interest in voluntarily participating.

In regards to the references sheet that can be shared via Google Docs, I will be anxious to see staff members add new applications or websites that can be beneficial to others’ classrooms. Because the sheet can be shared with others and can be edited with permission, this will not only provide teachers with an opportunity to easily collaborate with one another, but it also provides teachers with accessibility to websites or apps that they otherwise would have not utilized. In many conversations regarding what opportunities teachers wish to see, the most frequent complaint was that teachers did not feel that they had enough time to do individual research, and they didn’t feel that they were truly aware of how many resources are out there. With the ability to pin-point a specific skill that they would like to better their own practices for, and be provided with an immediate list of possible websites or apps to try, the pressure of spending significant amounts of personal time to investigate a resource that can be used to improve a lesson or project
is alleviated. In speaking with one of the three language arts teachers in the middle school, she stated that she liked how simple and clean the sheet was, and that she enjoyed that she could look specifically at one skill and see how many different resources could be applied to it. I look forward to the coming experiences and changes that will be provided through these projects.
References


Appendix A: Staff Survey Results

Survey Results

How old are you?
24 responses

How many years have you been teaching total?
24 responses
On average, how many students do you work with each day?

24 responses

How important is the use of technology in your classroom or setting?

24 responses
What sort of devices do you utilize with your students? Select all that apply.

23 responses

- Chromebooks 23 (100%)
- iPads 12 (52.2%)
- Tablets 4 (17.4%)
- Cell Phones 10 (43.5%)
- Desktop Computers 5 (21.7%)
- Communication 1 (4.3%)
- SmartBoard 1 (4.3%)
- Projector 1 (4.3%)
- Metronomes, rhythm 1 (4.3%)
- Smart Board 1 (4.3%)

What programs do you utilize most with students? Select all that apply.

24 responses

- Google Apps (G suite) 19 (79.2%)
- Socrative 8 (33.3%)
- Kahoot 8 (33.3%)
- Schoology 21 (87.5%)
- Moodle 1 (4.2%)
- Seesaw 1 (4.2%)
- Skype 0 (0%)
- Prezi 0 (0%)
- Quizlet 1 (4.2%)
- variety math apps 1 (4.2%)
- Smart Notebook 1 (4.2%)
- Math website 1 (4.2%)
- JMC 1 (4.2%)
- GarageBand.. 1 (4.2%)
- snap chat 1 (4.2%)
How knowledgable are you with the 4 C's?
24 responses

How comfortable are you using technology in your classroom?
24 responses
How would you best describe your personal use of technology in your classroom?
24 responses

- 56.3%: I try to use it as little as possible.
- 16.7%: I use it only for tasks the district requires of me (e.g., attendance, grades).
- 16.7%: I use it very sparingly.
- 16.7%: I use it, but it is not essential for my teaching.
- 16.7%: I use it frequently, mostly for delivering content.
- 16.7%: I use it daily.
- 16.7%: I use it for music and projection.
- 16.7%: I use it daily—more for student exploration.

How would you best describe student use of technology in your classroom?
24 responses

- 58.3%: Students do not use technology in my classroom.
- 20.8%: Students use technology to complete tasks, most of which they could complete without technology.
- 20.8%: Students use technology to complete tasks and conduct research.
- 20.8%: Students use technology to complete tasks, conduct research, and participate online.
- 20.8%: I use technology with students - met.
- 20.8%: Students use it in my room to complete tasks.
How often do students utilize technology to communicate with others in your classroom?
24 responses

How often do you provide students with opportunities to work with others?
24 responses
How often do you utilize project based assessments in class?

24 responses

- Daily: 12.5%
- Weekly: 12.5%
- Monthly: 8.3%
- 1-2 times per school year: 8.3%
- 2-3 times per school year: 8.3%
- Never: 29.2%

How would you best describe how technology has transformed your teaching?

23 responses

- I use technology as a substitute. I place lessons/activities that I previously conducted on paper online. 38.1%
- I substitute a lot of my materials through online programs, but I am beginning to explore new practices. 13%
- Technology has significantly redefined my teaching practices. 13%
- Technology has completely changed my teaching approach. It helps me... 34.8%
What skill do you feel you best practice and implement with your students?
24 responses

What skill do you feel you need the most practice for implementing with students in your classroom?
24 responses
Are you familiar with the SAMR model?
24 responses

- Yes: 41.7%
- No: 29.2%
- I have heard of it, but do not know much about it: 29.2%

How well do you feel you have been informed on the 4 C's by the district?
24 responses

- 1: 5 (20.8%)
- 2: 10 (41.7%)
- 3: 6 (25%)
- 4: 3 (12.5%)
- 5: 0 (0%)

How often do you research new teaching practices independently or in your spare time?

24 responses

- 33.3% Daily
- 29.2% Weekly
- 16.7% Monthly
- 16.7% Annually
- 4.2% I rely solely on district professional development opportunities to improve my teaching practices

How often do you experiment with new technologies in your classroom?

24 responses

- 41.7% Daily
- 33.3% Weekly
- 12.5% Monthly
- 2.1% 2-3 times per school year
- 2.1% 1-2 times per school year
- 4.2% Never
- 4.2% 4-5 times per school year
How often do you participate in voluntary sessions regarding new technologies?

24 responses

- 70.8% participate in almost every voluntary session
- 25% participate in 1-2 voluntary sessions during the school year
- 3.8% never participate in voluntary sessions

When able to choose professional development opportunities, do you prefer to attend workshops or sessions regarding technology?

24 responses

- 58.3% Yes
- 25% No
- 9% depends if it can find it applicable to my classes or extracurricular advising duties
How often do you request information regarding classroom tools or technologies from the media department in the district, not including technology malfunctions?

24 responses

Would you like to see more training/professional development opportunities from the district regarding the 4 C's?

24 responses
Appendix B: BrightBytes Survey 2017-Albany Area Schools

Survey Results

21st Century Learning requires organizations to meet the current requirements of our standardized tests while also striving to achieve the 4Cs: communication, collaboration, creativity, and critical thinking. The skills needed for success in college and career are becoming increasingly complex, and schools must rise to meet new demands.

New academic standards and accountability measures across the nation have broadened the classroom experiences required for proficiency. As expectations rise, students are struggling to keep up. This trend is evidenced by falling preliminary assessment scores across the nation. Traditional instruction may be to blame. In their recent Investigation of 21st Century Learning, National Academies Press found that rote learning does not support the educational transfer necessary to tackle the complex problems demanded by intensified academic standards. Students must be exposed to unfamiliar problems and encouraged to design meaningful solutions. Technology is a tool for such problem solving. A national Walden University study reports that teachers who use technology frequently place the highest emphasis on problem solving.

In addition to meeting traditional academic standards, students must also be prepared to tackle the demands of a modern world and modern workforce. A research report from Adobe Education notes that, “In today’s world, a proficient employee needs to be computer literate, visually literate, information literate, media literate, and digitally literate.” According to a report from the Partnership for 21st Century Skills, “Many of the fastest-growing jobs and emerging industries rely on workers’ creative capacity - the ability to think unconventionally, question the herd, imagine new scenarios, and produce astonishing work.” Technology assists with this type of capability. Pew reports that 76% of Advanced Placement and National Writing Project teachers believe that digital tools such as the Internet, social media, and cell phones “encourage student creativity and personal expression.” In addition, the National Writing Project reports that the creation and consumption of multimedia increases the likelihood of deeper learning and longer skill retention.

Technology is a key driver towards instruction that impacts student learning outcomes, both on standardized assessments and for 21st Century Learning skills. Students must have regular opportunities to engage in the 4Cs. In addition, they must have access to the instant feedback enabled by digital assessment and customized evaluative technology. Being aware of the classroom setting and the typical learning experiences afforded to students in your organization is the first step towards the cultivation of 21st Century Learning.
Contributing Factors

The factors that most contribute to the success of your organization include...

- **Teacher Use of the 4CS**
  - Emerging
  - Jun, Dec, Dec, Jun, Dec, Jun

- **Student Use of the 4CS**
  - Emerging
  - Jun, Dec, Dec, Jun, Dec, Jun

- **Teacher Digital Citizenship**
  - Proficient
  - Jun, Dec, Dec, Jun, Dec, Jun

- **Student Digital Citizenship**
  - Emerging
  - Jun, Dec, Dec, Jun, Dec, Jun

**CASE® Score Legend**

- Beginning: 500-899
- Emerging: 900-999
- Proficient: 1000-1099
- Advanced: 1100-1199
- Exemplary: 1200-1300

Jan 1, 2017 to Jun 30, 2017
Appendix C: ISTE Standards for Educators

ISTE STANDARDS
FOR EDUCATORS

Empowered Professional

1. Learner
   Educators continually improve their practice by learning from and with others and exploring proven and promising practices that leverage technology to improve student learning. Educators:
   a. Set professional learning goals to explore and apply pedagogical approaches made possible by technology and reflect on their effectiveness.
   b. Pursue professional interests by creating and actively participating in local and global learning networks.
   c. Stay current with research that supports improved student learning outcomes, including findings from the learning sciences.

2. Leader
   Educators seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Educators:
   a. Shape, advance and accelerate a shared vision for empowered learning with technology by engaging with education stakeholders.
   b. Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.
   c. Model for colleagues the identification, exploration, evaluation, curation and adoption of new digital resources and tools for learning.

3. Citizen
   Educators inspire students to positively contribute to and responsibly participate in the digital world. Educators:
   a. Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.
   b. Establish a learning culture that promotes curiosity and critical examination of online resources and fosters digital literacy and media fluency.
   c. Mentor students in the safe, legal and ethical practices with digital tools and the protection of intellectual rights and property.
   d. Model and promote management of personal data and digital identity and protect student data privacy.
Learning Catalyst

4. Collaborator
Educators dedicate time to collaborate with both colleagues and students to improve practice, discover and share resources and ideas, and solve problems. Educators:
   a. Dedicate planning time to collaborate with colleagues to create authentic learning experiences that leverage technology.
   b. Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.
   c. Use collaborative tools to expand students’ authentic, real-world learning experiences by engaging virtually with experts, teams and students, locally and globally.
   d. Demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning.

5. Designer
Educators design authentic, learner-driven activities and environments that recognize and accommodate learner variability.
Educators:
   a. Use technology to create, adapt and personalize learning experiences that foster independent learning and accommodate learner differences and needs.
   b. Design authentic learning activities that align with content area standards and use digital tools and resources to maximize active, deep learning.
   c. Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.

6. Facilitator
Educators facilitate learning with technology to support student achievement of the 2016 ISTE Standards for Students. Educators:
   a. Foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings.
   b. Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces or in the field.
   c. Create learning opportunities that challenge students to use a design process and computational thinking to innovate and solve problems.
   d. Model and nurture creativity and creative expression to communicate ideas, knowledge or connections.

7. Analyst
Educators understand and use data to drive their instruction and support students in achieving their learning goals. Educators:
   a. Provide alternative ways for students to demonstrate competency and reflect on their learning using technology.
   b. Use technology to design and implement a variety of formative and summative assessments that accommodate learner needs, provide timely feedback to students and inform instruction.
   c. Use assessment data to guide progress and communicate with students, parents and education stakeholders to build student self-direction.

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