

Digital Technology Can Support Curriculum in Higher Education with Relevancy Globally

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Abstract

The college and university's curriculum today must be designed in a practical and meaningful way to meet the employment needs of industry. Digital technology can be used to deliver curriculum in a more proficient manner. Curriculum must be implemented to meet the skill-set of students that is needed or in demand in the public and private work environment. Effective curriculum will address the needs of students; promote college readiness and workforce preparedness that is required for a global economy-based society. Curriculum is not new and it continues to evolve based on the needs of society (AACU, 2007). For the purpose of this study, curriculum will be defined as a body of knowledge to be transmitted in and out of the formal classroom.

With the infusion of digital technology, the delivery of curriculum has taken on a wider scope in the educational landscape. Technology can be used as a value-added tool to assist in transmitting curriculum in a quick and more efficient manner (Harris, Mishra, & Koehler, 2009). In order to meet the needs of potential employers today, it is essential and critical that curricular activities at colleges and universities are relevant and current to meet the demands of global communities in the workforce economy. Colleges and universities must ensure that faculty members at the university are teaching courses in a relevant and meaningful manner with high levels of student engagement using digital technology as a support tool in their own learning. This study will discuss and focus on how digital technology can support curriculum standards and framework, characteristics of viable learning communities, resources and delivery, benefits and challenges, professional development/engaging communities, impact on learning activities and evaluation of digital technology use in curriculum in higher education in global communities.

Keywords: Educational and Digital Technology, Curriculum, Relevant, Preparedness globally.

Introduction

The theoretical perspective and scientific evaluation may influence how instructional curriculum is designed to meet the needs of students in higher education. However, the most effective model for teaching should be student learner-centered Keengwe, J., Onchwari, G., & Onchwari, J. (2009). The application of theories of human behavior in the social sciences can utilize digital technology in broader ways to ensure student learning is effective. Technology use for the curriculum may determine new ways of teaching in order to meet the needs of diverse student learners (Gordon, 2000).

Digital technology for education curriculum may be implemented by the use of animations, videos, audio and internet access and software applicable and much more to give support to the

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curriculum in higher education. If faculty is not comfortable, however, with the technology, it may be a challenging experience based on the effectiveness of planning for digital technology infusion into the curriculum (Jenkins, 2009).

Digital technology and e-learning can occur in or out of the classroom. It can facilitate self-paced curricular activities, asynchronous learning or may be instructor-led, synchronous learning (Johnson, 2007). It is suited to distance learning and in conjunction with face-to-face teaching, which is termed blended learning. Digital technology and a blended learning facilitation of curriculum gives students choices in learning new and improved information. Educational digital technology can be used as a support tool by faculty members, learners and educators in homes, higher education institutions and many other settings (Bransford, Brown & Cocking, 2000).

Theory

The network of collaborative and productive spaces enabled by Websites has inspired an invigoration of constructivist educational theory and its application to a range of online learning spaces using digital technology. Faculty, learners and educators are able to communicate according to (Mansell,2002), and should provide feedback and collaborate learning communities in order to co-create the learning process using a variety of free-to-access synchronous and asynchronous technologies (Aleksander, 2012).

In constructivist theory learning takes place primarily through interaction between student learners and between learners and faculty members. Faculty members can assess the suitability of technologies in various settings and decide what are called their reasons for learning, that is, the essential features of technology and what the interface allows student learners to do. For example the use of Facebook may be the opportunities to support collaboration, a shared group identity and understanding of knowledge and information (McCarroll & Curran, 2013). When faculty members are familiar with the environments they can decide the type learning in a manner that supports learners' needs through the process (i.e. 'scaffolding' (Van Der Stuyf, 2002).

According to Martha Larkin 2002 for example, there are eight steps that faculty members should take based on research when developing scaffolded lessons. 1) determine curriculum goals and appropriate tasks. 2) assess the needs of student learners and engage learners in multiple tasks. 3) continue to monitor the learner's growth. 4) facilitate individualized instructional services to meet the needs of the students. 5) encourage student learners to focus on described tasks and activities. 6) give feedback quickly for advancement or improvement. 6) create a nurturing and caring environment where student learners feel comfort in taking a risk in learning discoveries. 7) encourage responsibility and independent learning (McKenzie, 2000).

Origin and Brief History of Digital Technology

American engineers began developing digital technology in the mid-twentieth century. Digital technology techniques were based on mathematical concepts suggested by the seventeenth-century German mathematician, Gottfried Wilhelm Leibniz, who proposed a binary computing system. Leibniz 's innovation inspired such numerical codes as American Standard Code for

Information Interchange as we know today is information technology (ASCII) that described objects with digits (Leibniz, 2008).

Digital technology is a base two level process. Digitized information is recorded in binary code of combinations of the digits 0 and 1, also called bits, which represent words and images. Digital technology enables immense amounts of information to be compressed on small storage devices that can be easily preserved and transported in a portable manner. Digitization also quickens data transmission with high speeds globally. Because of the expansion of technology, digital technology has transformed how people communicate, teach, learn, lead and work (Williams, 1986).

Looking at telecommunications, it has relied on digital methods to transmit messages for its inception. There have been enhanced fiber optics enabled the development of digital communication networks since the early 1980s in the United States. Digital technology replaced analog signals for many telecommunication forms, particularly cellular telephones and cable systems. Analog-to-digital converters utilized the pulse code modulation (PCM) to change analog data into digital signals. In comparison to analog transmissions, digitized signals were less distorted and could easily be multiplied or increase based on advanced technology (Couch, 1997).

In the United as early as 1998, commercial digital television broadcasts were premiered which was a form of digital technology. The use of communication satellites known as direct broadcast satellite (DBS) transmitted compressed digital signals have been available for viewers to receive several hundred television programming choices for over twenty years. There are several types of digital information such as audio programs, which were sent to subscribers via satellite. The demand from the Federal Communications Commission ordered that all American broadcasts to be digitally activated by the year 2010 according to Mollenhoff and Atanasoff.

There was digital printing with electro-photographic and formatted data technologies which have altered how books, literature and magazines are published. The Library of Congress National Digital Library Project has worked to preserve and expand access to rare items (Saettler, 1990). Because of the broad use of technology being so available to everyone, there have been copyright concerns and issues concerning digital technology have addressed the copying or downloading of music and videos without performers receiving royalties have lead to several legal matters. According to Mollenhoff and Atanasoff, there is a need to revisit copyright expectations or make direct contract with the author or artist concerning the use of music and/or other videos.

The Electronic Numerical Integrator, and Calculator (ENIAC) were often credited as the first electronic digital computer. A 1973 court ruling on patent infringement declared John V. Atanasoff and Clifford E. Berry were the digital computer's inventors and that the Electronic Numerical Integrator and Calculator had been derived from their design. Therefore, Atanasoff and Berry have been given full credit for creating the origin of digital technology (Mollenhoff and *Atanasoff, 1988*).

What is Digital Technology?

Digital learning is any type of learning that is facilitated by technology or by instructional practice that makes effective use of technology (Bates & Poole, 2003). Digital learning occurs across all learning areas and domains. Digital technology encompasses the application of a wide spectrum of practices including:

1. blended and virtual learning
2. game-based learning
3. accessing digital content
4. collaborating locally and globally
5. assessment and reporting online
6. active participation in online learning communities

Digital technology needs to be maintained, and faculty members need just-in-time help when troubleshooting problems occur. Whether human or virtual, technical support ensures that the technology continues to function in the classroom and online portals, remains up to date and is fully usable by faculty members, staff and students (Gordon, 2000).

From hiring specialists to creating peer networks, technical support can take many forms. For example, in some schools, student leaders help staff with troubleshooting. Developing a system for providing multiple types of support is a key component of any technology integration plan at the university for curriculum use (Warschauer, Matuchniak, 2010).

What can Digital Technology Do?

Digital technology can bridge the gap between school and home, creating a world where students are surrounded by learning opportunities at all times as they engage in curricular activities. To truly leverage the power of digital educational technology, educators need support by having appropriate technology access and ongoing professional development training to ensure competence in the facilitation of curriculum for classroom instructional delivery services to all students (Wei & Hindman, 2011).

An engaged community at the university understands the role of technology in education at the university. If given the opportunity, members of the community — including businesses, organizations and higher education institutions — are willing to collaborate and form partnerships with educators to support the many aspects of technology adoption and the infusion of technology into the curriculum (Harris, Mishra & Koehler, 2009).

Why is the Use of Digital Technology Important?

Digital technology is important, because it opens new doors for learning for diverse students around the world, but students can't walk through those doors if the technology is unusable or inoperable to the learning and teaching process. Consistent and reliable technical support removes these barriers and makes it possible for educators to better leverage their use of technology as an effective teaching, learning and management tool. It also minimizes the time

and energy that is spent on troubleshooting and problem solving. Digital technology gives individuals access and raises the equality bar for opportunities globally (Warschauer & Matuchniak, 2010)

What does Digital Technology look like?

In a standards-ready system, faculty members are supported in their technology use — both in learning how to use it and in applying it to their classrooms based on their specific discipline. Faculty members know how to get technical help without significant lags. Key considerations for planning would include:

1. Providing sufficient infrastructure to support ideal levels of technology use based on the specific discipline or coursework of study
2. Making access to technology specialists an easy task
3. Making diversified responsibility for technology use, implementation, monitoring, evaluating and providing appropriate support when needed as part of the regular curriculum facilitated by faculty members (Bates & Poole, 2003).

Why is Digital Technology Important for Curriculum?

Technology is all too often applied as an add-on to existing curriculum. To maximize its potential benefits such as the development of higher-order thinking skills faculty must weave digital technology into the curriculum in such a way that the tool matches the desired learning outcome. A curriculum framework bridges the gap between overall curriculum goals and the use of technology for learning and teaching (Hicks, 2011).

Curriculum Framework must be Purposeful

It is important to link Content standards and related digital curriculum resources that are aligned with and support digital age learning and work.

Technology is best able to enhance learning when educators use it intentionally within the adopted curriculum and how curriculum is facilitated or taught (Kiesler, 1997). As part of any system wide initiative, a curriculum framework is needed to pair defined content standards with digital curriculum resources that are aligned to the content learning goals.

A curriculum framework guides both how and when technology is used for learning. It ensures that technology is applied:

1. In ways that address the application of real-world experiences for student learners.
2. To ensure that student learners master the right skills at the right times for the right reasons that are relevant to the workplace environment.
3. To meet specific learning objectives to produce expected learner outcomes that are meaningful in the marketplace for career development and advancement (ISTE, 2015)

Delivery of Curriculum

The delivery of curriculum can be done in a variety of ways using a variety of technology tools through the internet. Curriculum is used to help student to achievement learning goals and outcomes. When the faculty member teaches courses, the curriculum helps students to know what expectations are at the university. Curriculum delivery also creates an opportunity for the student learner to interact with the design of the curriculum for example in reading, writing, problem solving, conducting research, analyzing case studies and policy issues or designing objects specific coursework. Curriculum gives the opportunity to teach, learn, advice, guide, mentor, tutor, coach, collaborate, evaluate, and give feedback to student learners. Digital technology can provide a quicker and more proficient way of interacting with the student learners. Curriculum helps the faculty member to practice and secure resources to help deliver the curriculum such as digital technology tools. Digital technology provides many ways of presenting curriculum to students to the point of personalizing the information for each student or groups of students (Kester, Liesbeth & Kirschner, 2007).

Curriculum and Learning Challenges

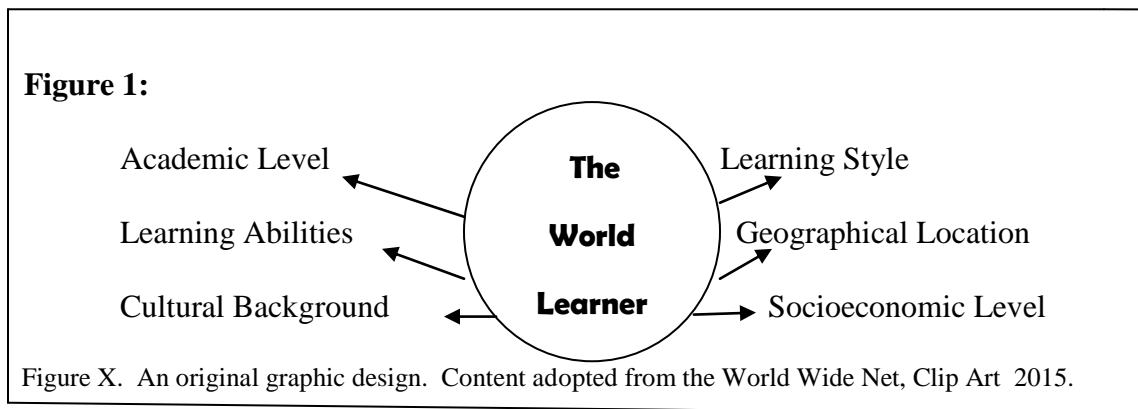
When a closer look is taken of curriculum, there are a few challenges based on context by use and intervention of technology. The ongoing biggest challenges are inequity of access to working computers, internet and unprepared faculty members who may not be competent in using available digital technology in the classroom (Cuban, 2001). Equal access to computers would assist student learners in accomplishing stated goals. However, the advantages to using digital technology affords faculty members the opportunity to conduct quick assessments, give feedback, employability of personalized learning, being flexible and accessible and improving high levels of engagement, and retention of student learners (Courts & Tucker, 2012).

The university and college's vision, goal, curriculum and e-learning plan using digital technology should guide the device program with the type of structure that is effective for learning. By using an e-learning planning framework that provides support to the university and college e-learning plan can be a great starter point. As simple as the following items, e-learning digital devices may include the computer, laptop, tablet, phone and ipad. With a comfortable faculty member using an assortment of digital technology, student learners could be asked to bring their own digital device to class for use which could motivate student participation in classroom activities (Cull, Reed, & Kirk, 2010). Students should have access to devices that they can use to support their own learning experiences at the university and beyond the university setting. The devices may be owned by the school or the student. The digital technology learning devices could be used for teaching and learning, educational gaming, research and creative designed activities. The greatest advantage of the digital device allows students to engage in learning anywhere and at anytime (Jenkins, 2009).

Digital technologies are electronic tools, systems, devices and resources that generate, store and/or process data. These include social media, online games and applications, multimedia, productivity applications, cloud computing, interoperable systems and mobile devices and more. The online and use of digital technology has expanded in many ways nationally and internationally. All colleges and universities have a number of online courses for the flexibility of student learners. It was projected that over 81 percent of curriculum courses will be offered online in the United States by the year 2014 (Ambient Insight Research 2009).

Global Curriculum and Digital Technology

Looking at a global perspective for curriculum integration of digital technology is essential. Using digital technology globally, will help all faculty members to have a broader view of students based on data related to learning styles, geographical location/culture background, socioeconomic levels, learning abilities and academic level of performance core subjects especially, but to offer student learners challenges and rigor experiences (Repetto & Trentin, 2011). A globally structured curriculum with appropriate data will help faculty gain access information of student learners and will be able to personalize information for each learner based on the learners' uniqueness. By knowing information about student learners, it could aid faculty members in meeting the needs of global students in facilitating the most effective level of curriculum instructional delivery services. Figure 1 shows informational data about the typical world learner.



Staying Globally Connected

Another way to stay connected to global communities personally and directly is by texting by cell phone and using other digital technology devices. A large number of individuals at the workplace and at the university use texting to stay in touch with individuals across the world. In some cases, individuals in classrooms and everywhere are using messaging. Nearly 21 countries were surveyed by the (Pew Research Center, 2011) and a median of 75% of cell phone users they text, take pictures/video 50% and use the internet 23 globally. Texting is done a lot in all economic settings. According to Pew, global communities are using digital technology through cell phone use at the following rate:

1. Approximately 72% of Japanese cell phone owners take pictures or video, as do
2. Roughly six-in-ten in Mexico (61%), Spain (59%) and Egypt (58%).
3. Fewer users access the internet via cell phone, although more than four-in-ten mobile phone owners use their device to go online in Israel (47%), Japan (47%) and the United States (43%) (Pew Research center 2011).

The survey by the Pew Research Center's Global Attitudes Project, conducted March 21 to May 15, indicated that social networking has high participatory rate in many nations around the globe. The country with the highest social networking is Israel (53%) and the U.S. (50%), where half or more say they use social networking websites. Approximately, four-in-ten individuals use social networking sites in Britain (43%), Russia (43%) and Spain (42%) (Redecker, 2009).

Social networking is considered more common in higher income nations; however, this is largely driven by the fact that wealthier countries have higher rates of internet access. People in lower income nations *who have* online access use social networking at rates that are not as high, or higher, than those found in more affluent countries (Pilgrim & Bledsoe, 2011)

In nearly every country, the young and the well-educated individuals are especially likely to embrace all of these technologies. People under age 30 and college graduates tend to use their cell phones for more purposes than those in older age groups and those without a college degree, and they are also more likely to use social networking sites (Guo, Li & Stevens, 2012).

Cell phones can be used in the classroom for curriculum instructional activities, because student learners can bring their own device to class. The cell phone is great to use in any classroom, just in case the regular stand alone computer is not working in the classroom (Tremblay, 2010). The cell phone advantages are as follows: 1) The cell phone has multiple capabilities today as technology advances. 2) The cell phone use is convenient, easy to use and it is a portable device (Pew Research Center, 2011).

Further Look at the Broader Use of Technology

The broad use of digital technology is expanding quickly in a more proficient manner globally. Today, there is an increase in students being enrolled in e-learning courses in most capacities. Some students are taking courses at more than one university. Some courses are for a degree and other courses are for professional growth and development. Diverse students globally with multiple learning styles and needs are taking advantage of taking courses totally online or partly online in a blended capacity (Baker, 2014). E-learning continues to open doors for all students including those students who are from low socioeconomic means to take classes on line part-time, because of heavy work schedules, family responsibilities and student learners with physical, language and/or mental challenges (Madaus, McKeown, Gelbar & Banerjee, 2012). In the United Kingdom enrollments in online courses have increased across the county. This access has resulted in a diversification of student populations, with the vast majority of the students now coming from lower socioeconomic backgrounds, and many of them are mature and part time students. For example, in England, 60% of higher education students in 2002-2003 were over 21%. Today the percentage of enrolled students online or using digital technology has increased to over 80%. This increase was largely due to the growth of part time student numbers in some form of higher education (Ashwin, 2006).

A Global Perspective of Digital Technology

Computers, video conferencing, computer games, online courses, blogs, video-sharing Web sites, smart phones, and Web tools, have all helped to connect our world like never before. They have

bridged distances and increased our opportunities to learn from each other: to see new places, meet new people, explore other cultures, learn new languages, and share and develop ideas. Bringing the world into the classroom has never been faster, easier, or more motivating for faculty members and students who may have different learning needs based on their language proficiency and culture (Prensky, 2001).

Educators agree on two key points. First, technology provides vital tools for twenty-first-century learning. Also, today's student learners are indisputably motivated by technology. Digital devices are already familiar gateways to the world for today's students. Used thoughtfully, these technologies can give students meaningful connections to people, places, and issues far beyond their own neighborhood (Tavangarian, Leybold, Nölting and Röser, 2004)

How can different digital tools and formats be used to promote global learning within content standards for accountability? These technologies should not be considered a supplement for existing curricula, nor should they be limited to technology training courses. Instead, they can be used to help faculty members meet their global learning goals across multiple curricular areas based on standards. Technology-based projects can be easily aligned to district, state and international standards (Roblyer, 2000).

A highly qualified professional in the knowledge economy requires the ability to pose critical questions and develop defensible responses to complex challenges (Repetto & Trentin, 2011). In developing these skills, faculty members and students can tap into a host of digital technologies. Locating and manipulating information online, collaborating in virtual work teams, and presenting and publishing via digital platforms is preparation for the future in a world that increasingly runs on technology

For example, discussing and sharing with faculty members at universities in Europe and the Middle East how to setup model leadership development programs for student learners who are seeking leading position in schools is another important use of technology. Digital technology has made it possible for new and improved ideas to expand (Berube, 2005).

The costs have decreased for the purchase of digital technology tools to support the curriculum in higher education. If the technology tools are available faculty members may be willing and able to use these tools to enhance curriculum delivery services? In some situations many faculty members who have access to the technology, but will not use it, either because of inadequate pre-planning lessons appropriately or faculty do not know how to use it and/or they are comfortable with same approach to teaching and learning (Kerr, 1996).

Digital Technology Impacts Global Communities and Learning

Openness Can Impact Broader Communities Globally. The early decision to open Web technologies for all was inspired by research sharing practices in academia. The Web has developed as a platform for sharing ideas, research and teaching. Open Access to research papers that have traditionally been published by academic journals and available at a high premium, has the potential to transform learning and research. Making academic research available to everyone via the Web provides opportunities for wider access to learning for the poor and those living in rural areas, and improves the uptake of research outputs globally (Antelman, 2004). Having access to the internet continues to expand learning and sharing of information in global

communities. Because of technology accessibility to millions of people can communicate with people from around the world in real-time (Desai & Graves, 2006).

Organizations, institutions, and businesses are using many aspects of technology to implement curriculum and to conduct ongoing professional growth opportunities of workers and others. Society has always been impacted by technology. Each invention has affected how people live, study, work and relate to one another and how cultures have expanded or ended (Gery, 1991). Technology impacts how cities grow, where people live, and who owns what. Technologies are the reason a few people are very rich, that people are more sociable, and that teaching and learning is changing. We are at a crucial time in history where we as educators and student learners can make a difference in how our students interact with one another and make a place for themselves in society globally (Thomas, Kass & Davarzani, 2014).

The early Web using digital technology gave learners and educators a sample of what could be achieved in this new environment. Student learners could access information that had previously been 'hidden' in libraries among mounds of books and much valued resource materials. Using archives, educators were able to either convert existing instructional curriculum activities or expand and/or reshape curriculum to make it more relevant. Faculty members are to collect valid quizzes and exams, development new assessment tools and guide student learners through structured learning objectives. By using digital tools, students are literate learners and faculty members are able to participate in collaborative projects, share and interact with others on a global scale (Eisenberg, 2008).

Evaluation

It is clear that teaching and learning processes are complex systems regardless of the curriculum used in the educational setting in higher education. The challenge is to develop evaluation models that reflect this complexity. Just as technology has caused us to reevaluate the nature of knowledge and instruction, it prompts us to reevaluate the forms of evaluation that are brought to bear when examining educational technology. There is a need to a new approach to the evaluation of complex social programs, one that is theory-based, aiming to investigate the project participant's theory of the program; one that emphasizes shared rather than adversarial interests between evaluators and program participants. This new approach should employ multiple methods designs and aim to produce knowledge that is both challenging and relevant to decision-makers. In order to accomplish these tasks it will be necessary to design evaluations of digital technology based on the experiences of evaluators, the experiences of program developers, "state of the art" in the field of technology, and learning and the various program descriptions in higher education (McNabb, Hawkes & Rouk, 1999).

With the continued use of digital technology, it is can be discussed that educators and users of technology should rethink and to redesign new and more relevant student learner outcomes. The learner outcomes would focus on a more global view related to the needs of the workforce economy. Faculty members need students who can think critically, solve real world problems using technology, take charge of their life-long learning process, work collaboratively and participate as contributing individuals in society. Experts in the area of technology and education such as Jan Hawkins and Henry Becker have developed ideas that could be converted into criteria for new ways of thinking about technology, teaching, and learning. These new learning

outcomes could be translated into learning benchmarks and new types of assessments and methods for measuring outcomes that could be developed to measure these benchmarks (Parlett & Dearden, 1977).

Conclusion

The benefits and impact of technology can phenomenally make a difference in transforming and connecting the world educationally, economically, politically, socially and culturally. Digital technology can have a profound impact on knowledge, education and learning globally at all levels (Shurville, Browne & Whitaker, 2009). Using digital technology in the curriculum is a way of completing a task quicker in a more proficient manner. Digital technology gives faculty members an unlimited amount of resources and ways to discuss and use a board range of information to expand knowledge and gain new knowledge (Janes, 2005). In order to benefit from using digital technology in the educational curriculum, there are ten ways how faculty members could enhance instruction by increasing time and place for activities, providing deeper learning and understanding experiences, expanding teaching and learning experiences, using technology for self-expression and engagement, creating an audience of interaction and collaboration, providing student learners with self-pace learning opportunities, creating a more portable way of transporting information to one place to another and expanding learning on to a global scale (Nagy, 2005).

Further benefits of incorporating digital technology into learning may include:

1. Improving open access to education, including access to full degree programs globally
2. Providing open access for educational opportunities for various programs and disciplines at the university
3. Sharing the opportunities for part-time or students who have physical and other challenges in acquiring an education conveniently compared to a traditional environment
4. Providing expanded opportunities for students and faculty to interact and discuss assignment requirement and extended projects
5. Improving the integration for non-full-time students, particularly in continuing education or career advancement while working
6. Improving interactions and collaboration between students and faculty members
7. Providing e-learning tools to enable students to independently solve problems in a collaborative manner
8. Offering learning for individuals of all ages and learners who may have physical and mental challenges
9. Benefitting from not having to travel long distance and it saves time and money
10. Using e-learning gives students' easy access to course materials in a quick manner. Plus the use of technology creates ways to motivate students motivation
11. Creating multiple ways to communicate to faculty, student learners and partnerships around the world (Kulik, 1994).

By communicating ideas with faculty peers in other countries is an important way to build global understandings and culture appreciation. Using digital technology can support research projects through curriculum expansion. Digital technology can afford faculty the opportunity to collaborate on book authoring and publishing a project that could be published in several

different languages. This type of collaborative learning works to foster cultural understandings as well as global content mastery (Aleksander, 2012).

Using digital technology connections to communicate with native speakers, especially other faculty is advancing their own language learning. Faculty and students today can easily connect and network (Murray & Waller, 2007). with their peers in another country, practice language skills with native speakers, see classrooms in action electronically in other nations, and make a human connection with someone across the world in just minutes. Therefore, the value and benefits of digital technology provides global opportunities to designing, implementing and assessing curriculum that can continue to expand globally based on the needs of the workforce economy (Trentin, 2010).

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