TRANSFORMING PEDAGOGIES:
Integrating 21ST Century Skills and Web 2.0 Technology

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ABSTRACT

According to (P21), Partnership for 21st Century Skills (n.d.), unless the gap is bridged between how students learn and how they live, today's education system will face irrelevance. The way people work and live has been transformed by demographic, economic, political, technological, and informational forces. Schools must adapt to these changing conditions in order to thrive. Students must be equipped to live in a multifaceted, multitasking, technology-driven world. And, regardless of their economic background, we must also ensure that all students have equal access to this new technological world. Collaborative learning theory which is connected to constructivism pedagogy requires students to work together to solve problems. Students need lifelong learning skills i.e., communication and information skills, problem-solving and thinking skills, and interpersonal and self-directional skills. The challenge becomes to deliberately incorporate learning skills into classrooms strategically and broadly. In this digital age, students must learn to use tools essential to everyday life and workplace productivity. They live in a world of almost unlimited streams of profound information, difficult choices and enormous opportunity. Teachers can create a 21st century context for learning by taking students out into the world, by bringing the world into the classroom, and by creating opportunities for students to collaboratively interact with each other (Learning for the, n.d.). One way of accomplishing this task is by employing the use of the Internet to connect Web 2.0 technology and 21st century skills. These skills are essential due to increased global competition, rising workforce capabilities, and accelerated technological change (Learning for the, n.d.).

Keywords: Web 2.0 technolgy, 21st Century skills, pedagogy.

INTRODUCTION

Pedagogy in education "refers to the schools of thought or philosophies regarding how people learn and how teachers should assist in that learning" (Web 2.0, n.d., p. 9). A high level pedagogy, constructivism, encompasses several pedagogies/learning theories which includes the learning theory known as connectivism. Connectivism has been deemed a 21st century learning paradigm and has been defined as a learning theory for the digital age (Seimens, 2005, in Web 2.0, n.d.). According to Seimens, "connectivism presents a model of learning that acknowledges the tectonic shifts in society where learning is no longer an internal, individualistic activity" (Siemens, 2005, pp 7 in Web 2.0, n.d.).

The collaborative learning theory also relates well with the constructivism pedagogy. With this theory, students are either encouraged or required to work together to solve problems, discuss ideas, or to acquire new knowledge.

Partnership for 21st Century Skills (P21) is an organization that advocates 21st century readiness for all students. They provide tools and resources to the educational system to assist in preparing students to compete in a global economy that demands innovation by fusing the 3Rs and 4Cs (communication, collaboration, critical thinking and problem solving, and creativity and innovation). P21 works on closing the gap between knowledge and skills that most students learn in school and the skills and knowledge needed in 21st century workplaces. In this digital age, students must learn to use tools essential to everyday life and workplace productivity. The way they work and live have been transformed by demographic, economic, political, technological, and informational forces. Students live in a world of almost unlimited streams of information, difficult choices, and enormous opportunity. Unless the gap is bridged between how they learn and how they live, today's education system will face irrelevance. Schools must adapt to these changing conditions in order to thrive; however, they are struggling to keep up with the rate of change of students' lives outside of school (Partnership for 21st Century Skills, n.d.).

According to P21, educators and researchers have made great strides in mapping the territory of the human mind. Thus, scientific insight is available to inform educators about the cognitive processes of learning, and to inform them about effective teaching and motivational strategies for student engagement in learning. Since we know more today about how students learn, we must equip them to live in a multifaceted, multitasking, technology-driven world. And, regardless of their economic background, we must also ensure that all students have equal access to this new technological world. The challenge now becomes on how to deliberately incorporate the integration of 21st century learning skills and technology into classrooms strategically and broadly (Partnership for 21st Century Skills, n.d.).

STATEMENT OF PURPOSE

The purpose of this paper is to explore integration of 21st century skills and Web 2.0 technology as well as the transforming pedagogies being fostered to accomplish this task as educators embrace the digital age.

LITERATURE REVIEW

The National Educational Technology Standards for Students (NETS.S) outlines standards and performance indicators that all teachers should meet. This standard includes the idea that teachers should be facilitators of student learning and creativity. Students should use digital tools to explore real-world issues and to solve authentic problems. Collaborative tools should be used to promote student reflection. Teachers should actively engage in student learning in face-to-face and in virtual environments. Digital age learning experiences and assessments should be developed. Formative and summative assessments should be aligned with technology and content standards so that results can be used to inform teaching and learning.

A technology enriched learning environment should be created that enables students to manage their own learning, and to assess their own progress. Teachers should model digital-age learning and work. They should exhibit knowledge and skills that represent an innovate professional in a digital and global society. Teachers should model and promote digital citizenship and responsibility. They should model, advocate, and teach legal and ethical use of digital information technology. This includes respecting copyright, intellectual property, and appropriate documentation of all resources (The ISTE NETS...2008).

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Teachers can create a 21st century context for learning by taking students out into the world, by bringing the world into the classroom, and by creating opportunities for students to collaboratively interact with each other (Learning for the, n.d.). Helping them make vital practical, social, and emotional connections to content and skill is of the utmost importance. Why? Because students in this era have grown up with access to the Internet and are capable of interacting and collaborating in ways that were unfathomable at one point in time. The Internet originally centered on only viewing information. However, with the advent of technology such as Web 2.0 which is defined as the "Read/Write Web," the Internet transformed so that those viewing information could also become active participants through collaboration and interaction. Viewers could now not only read information, but they could write and share information as well (Motivate and Engage, 2009). Thus, we as educators must adapt so that our instruction infuses Web 2.0 technology with 21st century skills. These skills are essential due to increased global competition, rising workforce capabilities, and accelerated technological change (Learning for the, n.d.). And, if our students want to be successful beyond the classroom, it is crucial that they master these skills (Motivate and Engage, 2009). This task can be accomplished by integrating transforming pedagogies, and the use of the Internet to connect to Web 2.0 technology, and 21st century skills.

Web 2.0 is defined as "The social use of the Web which allows individuals to collaborate, encouraging them to become active participants and/or producers in knowledge creation and to share information online" (Gould, 2010 in Web 2.0, n.d., p.3). Gould (2010) stated that at the center of Web 2.0 technologies lies a culture of continual interaction, communication, and sharing of content.

As educators give thought to developing innovative and creative ways to use electronic devices and establishing best practices for such use, it is important to reflect upon the research of Richard Light (Light R., 2001 in Web 2.0, n.d.). He concluded that if students could have group study sessions for as short a period as only one week, they were found to be more engaged, better prepared, and achieved better results as opposed to those who worked alone.

This finding is significant in terms of refining some of the best features of conventional practice. The teaching and learning process now becomes more interactive.

As a 21ST century learning paradigm shift is occurring, theoretical interest in viewing education as an ecosystem is gaining popularity. The term 'ecosystem' allows transfer of characteristics of ecology to the new digital age environment; and virtual communities can now be depicted by using these characteristics.

The term 'learning ecosystem' is a term that conveys new views with regard to the educational environment in the digital age. The role of a learning ecosystem is to unite participants through cooperation, sharing, reflection, publishing, development and learning, and through resources and participants, in a wide educational environment. Through the concept of learning ecosystem, we can find the idea that development of Web 2.0 allows people to benefit through interaction with each other. Everyone pursues their own goals within an organized sphere of a particular branch of knowledge (Web 2.0, n.d.). Learning competence is formed during the course of this process (Siemens, G. 2006 in Web 2.0, n.d.).

Thus, it can be concluded that the ecology of learning is related to Web 2.0 through use of collaborative tools such as wikis, blogs, social networks.

Collaborative Learning theory is the opposite of traditional learning whereby students are seen as being passive, isolated learners. Collaborative learning, which is in line with the new conceptions of learning, involves the mutual engagement of learners working together to solve a problem or working together on learning tasks. Computer Supported Collaborative learning "must explain how individual practices are social without forgetting that the social is grounded in individual activities" (Web 2.0, n.d. p. 11). The use of Web 2.0 transforms the learning context. Multiple opportunities are provided for shared content, for collaborative and self-directed learning, and for ubiquitous and lifelong learning (Ravenscroft, 2009; Roussinos & Jimoyiannis, 2011; in Web 2.0, n.d.). The Situated Learning Model focuses on social relationships, collaboration, and co-participation. This model, in its highest level, promotes an environment ideally through Web 2.0 where people are engaged in collective learning by helping, supporting, and encouraging each other as they work on problems and seek new forms of knowledge. Assuming that students will work together is the pedagogy behind online discussion forums. Characteristics justifying why some of these forums are gaining educational and pedagogical interest are:

> Wikis offers opportunity for engagement, reflective and collaborative creation of content, extends learning beyond the boundaries of the classroom, and provides blended learning activities that might not be possible in the classroom (Roussinos & Jimoyiannis, 2011 in Web 2.0, n.d.).
> Blogs offer collaborative creation of content, blended learning activities, and communication and participation in learning beyond the classroom (Angelaina & Jimoyiannis, 2011 in Web 2.0, n.d.)

Wikis are often referred to as "... a website (or other hypertext document collection) that allows users to add content, as on an Internet forum, but also allows anyone to edit the content" (Avram, 2006, p. 3 in Web 2.0, n.d., p. 12). Wikis provide an opportunity to facilitate and support a collaborative and networked learning environment.

Blogs allow you to post and organize information. Students and teachers are chronologically able to publish their experiences and reflections through such blogging tools as Edublogs, Blogger, and WordPress. Review of literature on educational uses of blogs suggested "the following categories of educational blogs:

> on-line course management tool,
> discussion forum,
> e-portfolio,
> group blogging,
> project-based learning environment, and
> research tool" (Web 2.0, n.d., p 13).

Forums also known as discussion boards or message boards allow messages to be posted and read by others; those reading the messages can in turn respond (Weisskirch and Milburn, 2003, p. 216 in Web 2.0, n.d.). Posted topics in forums are called 'threads' and replies to the posts are called 'posts' (Khan, 2009, p. 1 in Web 2.0, n.d.).Forums provide an alternative channel of communication between students and educators. This communication and monitoring of class discussions can be obtained by staff "... posting some question, requesting information, generating a debate, surveying students, and conducting a discussion" (Wijekumar and Spielvogel, 2006, p. 222 in Web 2.0, n.d., p. 13).

Other Web 2.0 technology includes VoiceThread. It is a multimedia tool that can be incorporated into an online collaborative project. Students can be divided into groups and use VoiceThread to reflect on videoconferencing technology such as Centra or Skype used in their online class. VoiceThread can be accessed from anywhere in the world. Conversations, documents, images, and videos can be collected and shared in a slide show. Comments can be left in the slide show through audio, text, video, and through duddling. Users are allowed to use multiple identities. This feature is beneficial for those who like to use avatars in programs such as Second Life. There is no software to purchase and install, it is free (Summerford, 2011).

Synchronous technology such as Centra can be used to have students discuss assignments. Centra allows students to hear as well as see each other simultaneously as they reflect on items such as asking and answering questions, discussing case scenarios, and reporting on their research of current news articles related to course topics (Tucker, 2012).

There are free Web 2.0 technologies such as Engrade, Elgg, Cramberry, PodBeam, Eduslide, Writeboard, Webchops, Yugma, Knowitall.org, and Arcademic Skill Builders (Schweitzer, 2010). Edublogs, Read-Write-Think, Intel-Tools, MakeBeliefsComix, and TerraClues have been recommended by Western, M. (2008).

According to Summerford (2011), the following Web 2.0 tools can be very useful to teachers in the classroom:

AjaxTrans is a free online translator with multiple languages that can be used in the classroom to one, assist in bridging the gap between language barriers. For example, Hispanic children who may not quite understand a concept can use this tool to type their question in Spanish and have the tool immediately translate what they are saying into English for the teacher; and vice versa. Two, teachers can use this as a tool in teaching diversity in the classroom.

Museum Box is a tool that can be used to build an argument or to describe an event, historical period, or person. One way to incorporate this tool into a business communication class is to have students do research on how to conduct business in other countries. Identify what to do, what not to do, as well as interesting facts about the country. From the information obtained, students would then use Museum Box to reveal the story. Text files and movies could also be incorporated. The teacher could provide feedback by typing comments directly within the cub boxes.

Comic Creator to have students brainstorm a small idea and place it into comic strip format. Excellent tool for student interns to use, perhaps as an icebreaker, or as a means of teaching one item of critical thought using comic as a means.

Google News feeds – can be used to research current issues with regard to topics/concepts taught in the classroom. For instance, for the social, legal, and ethical course, current news articles can be obtained regarding social, legal, and ethical issues in education.

Jing Free, http://www.techsmith.com/jing.html you can create images and videos of what you are viewing on your computer monitor. Jing can be used to provide feedback to students when grading their papers; and students can use it to collaborate as well as ask questions.

DISCUSSION AND SUMMARY

The digital age is here and it is evident that educators must embrace the 21st century learning paradigm shift to ensure that students are adequately prepared for the global workforce. Students enter the classroom well versed in technology. Many take courses, without having to leave the privacy of their homes, through distance education. They are not limited by bricks and mortar. Yet, they now have the ability to obtain an education from anywhere, and still be able to work collaborative with their classmates. This has been made possible because of the willingness of educators to embrace change. Educators have adopted technology that allows for collaborative work.

They have also required higher order skills of students, 21st century skills, and have embraced pedagogies that require students to think 'outside the box' so that they are able to compete in a global society.

Many of the technologies available for use are user-friendly and free. With the thought of bringing the 'world' into the classroom to provide real world experiences, educators should continue to adopt technology.

They should learn to use and successfully implement the technology into instruction. Clear instructions on how to use the technology should be provided to students.

As an educator, I have used several of the Web 2.0 technologies in my distance education courses and according to feedback from students; the use of this technology was highly successful.

Asynchronous collaborative technologies have been utilized in my classes. Blogs were used to have students introduce themselves to each other at the beginning of the semester. Students submitted a post that responds to ten items including things such as telling about themselves, their education, and their family; inserting a picture of themselves; discussing their most memorable success; discussing what they hope to gain from the course; and discussing their thoughts on the job market and the economy today. They are then required to respond to every classmate's blog.

This is a required assignment and each item within the assignment is worth so many points; including their response to each classmate's post.

Synchronous technologies such as the Centra chat room have been used in my classes to have students discuss assignments. Centra allows students to hear as well as see each other simultaneously as they reflect on items such as asking and answering questions, discussing case scenarios, and reporting on their research of current news articles and reflections related to course topics.

So due to increased global competition, rising workforce capabilities, and accelerated technological change, I believe it is important for us as educators to adapt instruction so that it infuses Web 2.0 technology with 21st century skills.

And, if our students want to be successful beyond the classroom, it is crucial that they master these skills. All of this can be accomplished by integrating transforming pedagogies, and integrating the use of the Internet to connect to Web 2.0 technology, as well as integrating 21st century skills.

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