Producing 21st Century Learners:
Are teachers effectively instructing through technology?

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Abstract

This paper reflects the review of research to determine whether or not teachers are effectively communicating with and teaching students through appropriate technology. Are educators creating 21st century learners or simply allowing technology learning experiences to slip past? This paper utilizes research articles that will imply that learning through technology is taking place and teachers are currently working through the means they have to create these 21st century learners.

Problem

According to various government entities, the technology standards for educators are to produce 21st century scholars. According to the International Society for Technology in Education, it is a teacher’s responsibility to teach the following technology standards, “1. Facilitate and Inspire Student Learning and Creativity, 2. Design and Develop Digital-Age Learning Experiences and Assessments, 3. Model Digital-Age Work and Learning, 4. Promote and Model Digital Citizenship and Responsibility, and 5. Engage in Professional Growth and Leadership” (ISTE 2008). Each of these standards is met through the utilization of technology that is available in each individual educator’s area or school. The problem is how teachers incorporate these standards into their classroom with limited budgets and limited access to technology.

There are many facets of technology integration for a teacher or school to understand and apply. Some of these facets include curriculum-based instruction practices, technology competencies and the concept of learning through technology. Through these three concepts, I have reviewed related research and have found some interesting information that can help classroom teachers and administrators help their students become 21st century scholars.

Methods

Are teachers effectively instructing through technology? This is the question that I want to answer through this research study of available literature. To answer this question, I began to search the
Producing 21st Century Learners: Are teachers effectively instructing through technology?

Galileo and ERIC databases for instructional technology articles that related to education, mainly K-12 students. I used a full text article search, as well as a peer reviewed search. The resulting articles were perfect for my research. I chose fifteen research articles that reflected different aspects of my research question.

Curriculum-Based Instruction Practices

The first selection of articles articulated the idea that in order for technology in the classroom to be successful, the teacher must effectively incorporate technology into their current curriculum. It cannot be a separate lesson or concept taught. It must be integrated in order for the student to gain the most use out of it.

Many articles used technology as only part of their study. These are research studies that included more of the curriculum-based approach. One such article that I found to be very helpful in my search was, An exploratory study on the perspectives of prospective computer teachers following project-based learning. This research article by Celik and Karaman discussed how technology can improve the effectiveness of project-based learning in the classroom. The study interviewed 29 prospective computer teachers who were taking a course in the fall of 2004. These interviews were used to find that Project-Based Learning through the use of technology was effective and not only allowed the student to learn the material, but also allowed the student to gain life-long skills and learning strategies.

Within the scope of my research, I found at least five research studies that demonstrate the idea that curriculum-based instructional practices, along with technology integration, enhances the learning of everyone involved. The key to this success is the implementation of best practices into schools. In a study by Abbott, Buzhardt, Greenwood and Tapia, they researched effective educational practice for implementing innovations in schools. This study used fifty-five general education teachers and their students in nine schools across five states. The researchers had the teachers use protocols to implement some type of innovation in their school. There were different levels of communication between the
Producing 21st Century Learners:
Are teachers effectively instructing through technology?

teachers, schools and researchers and these different levels were somewhat related to the effectiveness of the protocol. This demonstrated that with new implementation of practices or innovations in a school, the schools must follow some sort of fixed protocol and effectively communicate with the appropriate channels in order for the implementation to be a success. This goes back to the thought that curriculum-based approaches with technology are difficult, but necessary for effectively creating 21st century scholars.

With the works of these researchers, I can conclude that curriculum-based learning experiences with technology are imperative for learning in today’s society. There are many other articles and researchers that have their own views of how curriculum and technology should be intertwined and this is something that will still be researched for many, many years to come.

Technology Competencies

The next selection of articles that are included in my research on creating 21st century learners is a group of research articles that investigate technology competencies of students and teachers within the K-12 setting. This is a collection of articles that introduces the technology perspectives of students, discusses the effectiveness of distance education Competencies (Johnson, et al, 2008), discusses if technology assistance in the classroom improves academic achievement (Delfino, Persico, 2007), analyzes student response system technologies (Kara, 2007), studies the student population’s technological competencies (Boscardin 2007), and studies the stress that is put upon students in today’s technology-driven society (Husen, Selwyn, 2010).

Technology competencies are different for everyone. I, for one, love technology and love to read about new technologies and learn new technologies. Many people do not. Johnson, Lee, Spires and Turner (2008), decided to investigate the perspective of middle school students on how they use technology in and out of school. Over four thousand middle school students were polled in North Carolina. The researchers used surveys to compile lists of the types of technologies that the students
Producing 21st Century Learners:
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knew and used in school or out of school. This is an ongoing research project and teachers and schools use this information to direct what type of technologies they will teach with during the school year.

The next article that demonstrates that technology competencies are important is a research article about distance education. *Online or face-to-face? Experimenting with different techniques in teacher training* (2007) is an article about the effectiveness of online courses and face-to-face courses. Are they both a successful way to learn? The researchers used case studies to investigate their research question. They used EdTech students from 2001 to 2005 and used their course evaluations to gather information. The results of this showed that as the student progressed in their education, they became more and more interested in online courses. The technology competency and ease of the online program effected the participation of the student in the online setting.

Technology competencies are varied among students and teachers in the K-12 setting. These competencies must increase in order for the educator to create the 21st century style learner. The articles that were addressed in this section are some that will help teachers and administrators more fully understand the impact of these competencies on their students.

**Learning Through Technology**

Learning through technology is something that is the goal of the ISTE as stated in the introduction of this review. There are many research projects that use learning through technology as a research question. The first article that demonstrates that learning through technology is something that educational researchers consider during many research projects is an article about online assessments. *Does regular online testing enhance student learning in the numerical sciences?* (Angus, Watson, 2009). This study investigated math courses in the United Kingdom. The students were assessed using paper and pencil exams and they were given online assessments. The students used the online assessments as study tools and therefore they were successful when completing the regular exam. With this type of research, there are implications that we as teachers must hear. The online
Producing 21st Century Learners:
Are teachers effectively instructing through technology?

assessments were used as reinforcement activities and review and allowed the student to compete them over and over and at their own pace because many were accessed from home. Educators need to see that this is a resource that should be utilized as much as possible.

Conclusion

Producing 21st century learners is a significant and imperative part of learning today. The research question that was asked in this review of literature was, “Are teachers effectively instructing through technology?” This question allowed me to complete research on a topic that is very close to me personally because I am an educator. There are many standards that I must cover in my classroom as well as standards that are not necessarily required, but that are imperative to producing citizens of the 21st century. This research has allowed me to delve into the concepts of instructional practices, competences and learning through technology. The knowledge that I have gained results in two points. First and foremost, technology is a part of society and as an educator; it is my duty to use this technology to help my students grow into these 21st century scholars. Secondly, I must never stop learning about researching technology relations to the classroom because they are ever changing. Even through the scope of this class, technology has change in some way or another. It may not affect us immediately, but as a teacher, I must be prepared to overcome new anxieties about technologies and convey their usefulness or importance to my students, now and in the future.

Future Research

The question, “Are teachers effectively instructing through technology?” has been answered in this literature review, however, there is much more research to be done. Questions that can guide this further research are, “As technology changes, does the competency of the technology user change with it?” or “Is technology integration necessary for the success of a K-12 learner. Future research would be mixed method because of all of the intricacies of the concepts and questions that are to be explored.
Producing 21st Century Learners: Are teachers effectively instructing through technology?

Future research on the questions stated above would be very beneficial to educators and instructional technologists. Researchers could use questionnaires, surveys, interviews, data analysis, and more to gather data for their study. Many of the participants would be students in the K-12 classroom or K-12 classroom teachers. Other people that could be involved in studies over technology in education could be parents or administrators. While looking at the data that will be collected for the new research questions to fuel future research, the researcher will need to review the data and find correlations among the data. This will allow the correlations to be used to answer the research question. If there is no correlation found, the research may need to refine the question and began new or updated research. Research on technology in education will always be something that will be continuously researched. The future students need to be prepared for this, so it is our job as educators to share this current research with them in hopes that it will inspire someone to continue this process.

References


Producing 21st Century Learners: Are teachers effectively instructing through technology?


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