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What Technological Tools Do Teachers Apply in the Teaching and Learning Environment?

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Abstract:
What technological tools do teachers apply? This article dwelt on research into the technological tools teachers do apply in the teaching and learning environment. The research approach was the qualitative research format and secondary data were drawn from books, schools and / or counties which have made use of technological tools, then are scholarly journal articles as well as online resources such as the United States Department of Education website etc. Among the illustrative schools and/ or counties included Elmore County Public Schools, Florida Virtual School, and then Duke University. From this study it is recommended that what developing countries need, in this 21st century, is a substantial overhaul of education and training which could match the technology revolution and maintain some pace with continued technology development.

Keywords: *Technological tools, teaching and learning environment, computer use, online learning, podcasting, utilization of computers, data driven decision making*

1. Introduction

Technology usage has increased in public schools and / or counties in recent years (Cuban, 2001). Some schools and/ or counties have acquired hardware to aid computer use in almost all classrooms. In New Jersey, for example, a survey report on Technology gave a ratio of students-to-computers as 4.1-1 (New Jersey Department of Education, 2003).

With the birth of technology, especially with the amount of funding in the area of technology, many researchers have made several attempts to weigh the influence of technology on teaching and learning (Cuban, 2001). It was as a result of such a concern that the International Society for Technology in Education (ISTE) put up a committee tasked for setting standards in educational technology. The standards gave parameters for curriculum design and development and also planning for successful technology integration into education (International Society for Technology in Education, 2000b).

1.1. Research Problem

In spite of the colossal amount of dollars put in by schools and/ or counties in the areas of computers and accessories acquisition (Cuban, 2001, 2003), teachers apply technology as if they were in the past. It must be stated that the promise of a technology era of teaching and learning which had been predicted when computers were injected in the sphere of education is still lagged (Cuban, 2001, 2006). It is, therefore, against this background that this research is conducted on the technological tools that teachers do apply in modern day teaching and learning environment.

1.2. Research Question

The research question for this work is what technological tools do teachers apply in the teaching and learning environment? (Qualitative)

2. Literature Review

This section looked at the complex nature of change, technology in the teaching and learning environment, teacher utilization of computers in instruction, and educational technology and data driven decision making among others as the literature for this research.

2.1. The Complex Nature of Change

Change, according to (Doll, 1978), involves a shift in position that may go in either a favorable or an unfavorable direction (Doll, 1978, p. 197). With the change in the introduction of technology into the classroom bring into play other changes. Formally, students'

achievements were based on the traditional system of social scientific investigation, and since schools are complex social environments, it is not possible to change one thing at a time. For instance, teachers' perceptions of their students' abilities might shift if technology is integrated into the classroom (Honey, Chang, Light, & Moeller, n.d). Next is that using technology tends to bring about collaboration among students, which might bring a positive influence on student's achievement (Tinzmann, 1998). Retrieved from http://www.ncrel.org/sdrs

2.2. Technology in the Teaching / Learning Environment

According to (Erickson, 2002), "teaching can be quite isolated from the rapid changes in the business world" (Erickson, 2002, p. 108). Because a key component of education is to prepare students for success in work, it is important to understand how the world of work is structured and functions today. What are the work skills expected of graduating students? What kind of world will they be entering as they move into a global labor market? The business world is changing dramatically and rapidly. Teachers study this phenomenon and adopt their curriculum and instruction to balance this component in the educational program with other aspects of a well –rounded educational plan. Our educational program does not revolve solely around meeting work requirements and skills; but to promote the continuing economic health of our society, it is certainly one of the important components in curriculum design. From this assertion it could be deduced that it is very important to look at the relevance of aspects or themes put in the curriculum and that as technology rules today it is significant to incorporate technology into the educational arena.

2.3. Teacher Utilization of Computers in Instruction

According to [Peerless, Feldman, and German, (n.d)], the utilization of computers by teachers is questioned by several researchers in the field of educational technology. The question then is how much are computers really used by teachers? Cuban has for the past decade and a half has put forward many arguments that the computer as a medium of instruction as well as tool for student learning is mainly incompatible with the requirements of teaching (Cuban, 1986). Cuban posits that teachers have so many students to teach along with an accountability demanded of them, which makes it too hard for most teachers to incorporate student usage of computers as regular part of their instructional practice. In short Cuban concluded that computers have been underutilized. However, many programs are now available which rather makes teachers and educators use of computers easier especially in the teaching and learning environment. It is, therefore prudent for teachers, educators, and administrators to utilize computers to the maximum so as to benefit students in the long run. As cited by [Peerless, Feldman, and German (n.d)].

2.4. Educational Technology and Data Driven Decision Making

The relevance of educational technology on student learning hinges not only on what outcomes are targeted as well as how well the integration of technology is done but also on how students assessment is done by teachers in classrooms and then adjust accordingly. A broad range of tools to collect and analyze data are offered by technology. Schools monitor the influence of technology so as to enable all students to achieve a desired level of performance (Mitchell, Lee, & Herman, 2000, p. 22). However, there is a growing consensus that schools are not adequately equipped for the task of critical thinking about the relationships between instructional practices and student outcomes despite a greater deal of encouragement at the policy level (Confrey& Maker,2005; Olsen,2003; Hammerman & Rubin, 2002; Herman& Gribbons, 2001; Kearns & Harvey, 2000). Retrieved from http://www.ncrel.org/sdrs/

2.5. Summary

The main points raised in the review cover; the complex nature of change, technology in the teaching and learning environment, teacher utilization of computers in instruction, and educational technology and data driven decision making among others and has been reviewed on the basis of the past and current studies.

3. Methodology

The qualitative research approach has been employed in this section to examined existing data collected by previous research studies of education on technological tools which teachers do apply in the teaching and learning environment as well as data bythe United States Department of Education, and then other published books.

In this research only secondary sources were used. This was as a result of the fact that secondary sources inevitably reflect the assumptions and biases of the people who wrote them. Such may be the case even when the sources were written soon after the primary sources were created (Leedy, & Ormrod, 2010, p. 167).

Existing data collected from previous studies were used to address the research question: What technological tools do teachers apply in the teaching and learning environment? Data were examined for the relationship between technology and curriculum regarding how technological tools are used by teachers. Data collected from the United States Department of Education were analyzed for any reflections of patterns of improvement of schools, and/ or students as a result of technology on curriculum innovation and suggestions of future success have been made.

4. Data Analysis

This section unfolds the technological tools utilized in the teaching and learning environment as supported by some schools and / or counties, as well as research works and online recourses which buttress the utilization of technological tools in the educational arena. The research question being addressed in this section is: What Technological tools are utilized in the educational arena?

4.1. Illustrative Schools and / or Counties

Elmore County Public Schools continues to build upon the initial success of the Elmore NET Project. As possibilities grow and interest in the application of computer technology to existing academic disciplines develops, Elmore County Public Schools resources fall short of meeting legitimate technology needs. The planning and implementation of the Technology Coordinator at Elmore County Public Schools has insured that technology acquisitions have been prudent, resource-wise, and geared to avoid technological obsolescence, an altogether too- frequent occurrence in the world of educational computer use. In fact, most of Elmore County Public Schools' technology purchases have studiously avoided so-called "educational" software and hardware, opting instead for choices that reflect today's business use of computer technology. (Retrieved from http://www.elmoreco.com)

Florida Virtual School: Online Learning: Virtual School

The Florida Virtual School "offers more than 90 classes as well as employs 295 full-time teachers and then 160 adjunct teachers" (Starkman, 2007). Also is the Maynard, MA Virtual High School which have students from 30 states and 20 countries. Accommodations must be made in online classes so as to be available to any student, regardless of ability levels. (Retrieved from http://www.ua.edu/edtechcases).

Duke University: Podcasting on the go

Podcasting could be described as an automated technology which allows persons to subscribe and listen to digitally recorded audio (Flanagan, 2005). Duke University has concluded an interesting studies on podcasting with which the results showed that there was no difference in grades of learners who receive instruction in class as against those who receive auditory instruction via podcasts.(Retrieved from http://www.ua.edu/edtechcases)

4.2. Implications

The schools and/ or counties as well as previous studies looked at above lent support in answering the question what technological tools teachers utilize in the teaching and learning environment. It is of great importance that schools across the world employed technological tools in this day and age as evidenced above. This is in the light of the role technology is playing this day, whereby teachers are now at peace with the delivery of instruction in the teaching and learning circles.

4.3. Summary and Conclusion

This study has looked at the utilization of technological tools by teachers in the teaching and learning environment. It must be mentioned that due to the data examined Educational Technology: It could be said that technology is here to stay and that the future looks even brighter with the integration of technology into our curriculum. This is given weight by these authors: (Robyler, & Doering, 2010), stated that " as we look today at what is happening with technology - and what the future promises - in classrooms across the country, we see that some of the most innovative and promising practices in education involve technology, and the promise of even more exciting capabilities foreshadows great benefits for teachers" (Robyler, & Doering, 2010, p. 1).

4.4. Limitations of the Study

The attempt to generalize the findings of this study is compromised by the following limitations. First, in the effort to represent the numerous literature on the technological tools utilized by teachers in the teaching and learning environment, only secondary sources were used. Thus; the research design was structured to consider the secondary sources of materials including; United States Department of Education collection of data, published works, previous research works as well as online resources on the technological tools utilized in the teaching and learning environment. Also the number of illustrative schools and/ or counties is limited to only the United States of America.

5. References

i. American Psychological Association. (2010). Publication manual of the American Psychological Association (5th ed.). Washington, DC: Author.
ii. Cuban, L. (2001). Oversold and underused: Computers in the classroom. Cambridge, MA: Harvard University Press.
iii. Cuban, L. (2006). Oversold and underused: Computers in the classroom. Cambridge, MA: Harvard University Press.
iv. Doll, R. C. (1978). Curriculum improvement: Decision making and process. (4th ed.).
v. MA: Allyn and Bacon Inc.
vi. Elmore County Public Schools. ElmoreNet: Changing the way we use technology to increase student achievement, Office of technology. ElmoreNET (p. 9)
vii. Retrieved from http://www.elmoreco.com
viii. Erickson, H.L. (2002). Concept-based curriculum and instruction: Teaching beyond the facts. CA: Thousand Oaks.
ix. Honey, M., & Henriquez, A. (1996). Union city interactive multimedia education trial:
x. 1993 - 1995. Summary Report.CCT Reports, Issue No. 3,
xi. (Retrieved from http://www2.edc.org/CCT/cctweb/).
xii. Leedy, P. & Ormrod, J. (2010).Practical Research: Planning and Design. New Jersey: Pearson
xiii. New Jersey Department of Education, (2004). New Jersey technology survey results
xiv. Peerless, S., Feldman, E., & German, C. (n.d). Digest of literature on the impact of the computer in instruction. (Retrieved from www.lookstein.org)
xv. Roblyer, M.D., & Doering, A. H. (2010). Integrating educational technology into teaching (5th ed.). Columbus, OH: Pearson.
xix. www.iste.org