WCETR 2011

Technology as a medium for applying constructivist teaching methods and inspiring kids

Masoud Azizinezhad [a] *, Masoud Hashemi [b]

[a]MA in Translation Studie Department of English, Toyserkan Branch , Islamic Azad University,Toyserkan, 6581685184, Iran
[b]MA in Teaching English as a Foreign Languages, Department of English, Toyserkan Branch , Islamic Azad University,Toyserkan, 6581685184, Iran

Abstract

Constructivist teaching is based on constructivist learning theory. This theoretical framework is based on the belief that learning occurs through what a student already knows; this prior knowledge is called a schema. Because all learning should pass through the filter of the pre-existing schemata, constructivists suggest that learning is best accomplished when a student gets actively engaged in the learning process rather than attempting to receive knowledge passively with the teacher avoiding most direct instruction and attempting to lead the student through questions and activities to discover, discuss, appreciate and verbalize the new knowledge (Richards et.al., 2001).Technology is increasingly gaining attention of those who are obsessed with improving teaching and learning. In this research attempts has been made to describe and analyze elementary teachers' perceptions of using technology as a means for implementing classroom constructivist activities. Doing this, private schools were chosen were every classroom was equipped with a PC for the teacher as well as students. The PCs were networked so that all students could interact with the teacher and other students independently or as a group. Data was gathered through questionnaires from both teachers and students. Findings of the study show that teachers intend to look at the technology provided as an effective tools for developing constructivist practices and for gaining students' interest. Students are given free rein to be in charge of learning experiences. This method initiates an active and positive learning environment that is technology based, including teamwork while maintaining independence where necessary, which is safe and avoids the anti-motivation effects of being judged. The results show that teachers reported an increase of test scores.

Keywords: Constructivist education, Leadership, Technology in education, Technology integration

1. Introduction

Many school districts across the nation are searching for ways to improve their organizations, teaching, and learning, through the increased use of technology. As literature increases regarding technology use in the educational arena, it seems to indicate that educators are becoming aware of this approach as an aid for meeting their academic and organizational change goals (Nanjappa & Grant, 2003; Phillips, 2000; Shapiro, 2003). The present study examines elementary teachers' perceptions of using technology as a catalyst for constructivist practices in the classroom.

"Constructivism is a learning or meaning-making theory that offers an explanation of the nature of knowledge and how human beings learn. It maintains that individuals create or construct new understandings through the connection of what they already know and believe, together with new found learning, and draw on their own

Masoud Azizinezhad Tel.:+0-98-918-351-410-1; fax:+0-988524223288.
 E-mail address: mazizinezhad@gmail.com.

conclusions" (Brooks & Brooks, 1993, 1999, 2000; Lambert, 2003; Marlowe & Page, 1998; Shapiro, 2000, 2003; Isaacson, 2004). This study also examines the background and steps that evolved throughout the reform process.

2. Purpose

This case study examines elementary teachers' perceptions of technology as a catalyst for constructivist practices in the classroom. Constructivism is a learning theory that provides a framework where individuals create, or construct, new understandings through the connection of pre-existing knowledge and beliefs with new found learning, and draw their own conclusions (Brooks & Brooks, 1993, 1999, 2000; Lambert, 2003; Marlowe & Page, 1998; Shapiro, 2000, 2003).

3. Research questions

The author of this study focused on the practices of elementary school teachers who are implementing a One-to-One technology initiative, what might be learned from them, and how the teachers' perceptions of the efficacy of technology as a catalyst to implement constructivist practices in the classroom affects the implementation of change.

The research questions in this study were used to investigate the culture of these One-to-One classrooms, delving into changes in pedagogy, developing organizational patterns, emergent constructivist themes and practices, and the barriers encountered when integrating technology into the curriculum.

Research Questions: 1. How do novice and expert EDGE (Education through Dynamic Global Experiences) teachers perceive that technology changes teaching and learning in the classroom?

2. What patterns of experiences emerge in the classroom when implementing technology? 3. How can

one use technology to promote constructivist instructional practices? 4. What are the major barriers

that teachers report they experience when implementing technology into the curriculum?

4. Method

The research method utilized a survey to determine the teacher's demographic background, technology experience, and general attitude and confidence using technology. The survey also provided the preliminary data needed to elect the focus group participants. From the survey, seven teachers were chosen to participate in two focus groups parating beginners and experts. Because the survey data regarding attitude and confidence was homogenous and high, the focus group participants were differentiated by their years of experience with the One-to-One initiative. he "expert" group had four or more years experience and the "novice" group had one or two years. The focus group discussions were transcribed verbatim. These documents were later categorized and coded by the researcher (Seidman, 2006).

5. Significance of the study

The significance of the study is that the findings may be used to advance the body of existing knowledge about the impact of technology, in the form of one computer per student and teacher, on the teachers' perceptions of technology as a catalyst for stimulating constructivist teaching and learning, and motivating both teachers and students.

The study surveyed 33 elementary teachers who were participating in a One-to-One initiative that was part of a comprehensive district program to bring technology into the classroom. The One-to-One initiative provided individual laptop computers to students and teachers. The program also provided essential software solutions, wireless connectivity to the Internet and local network servers, and instructional support personnel.

6. Constructivist philosophy and literature

A review of the literature described how researchers view constructivist philosophy and how it relates to student learning in an elementary school. The descriptions of constructivist beliefs were used to identify relevant parts of the teachers' descriptions in the focus groups of student and teacher interactions. Blase & Blase (1998) report that constructivist learning occurs in a variety of ways. In a constructivist environment, the learners need to be actively engaged, know how to work independently, build upon prior knowledge, work collaboratively, make connections, and think critically.

These learners are engaged in an active experience, can solve problems, form new ideas based on past experiences, and construct their own knowledge (Blase & Blase, 1998; Brooks & Brooks, 1993, 2000; Lambert, Collay, Dietz, Richert, & Richert, 1997; Marlowe & Page, 1998; Shapiro, 2000, 2003).

The constructivist culture promotes democratic processes and also includes a safe, risk-free place in which to learn. The process of learning and infusing technology in the classroom occurred in an environment that promoted reflective practices, small group instruction, project-based learning, ademocratic process, self-assessment, and goal setting (Apple & Beane, 1999).

7. Summary of findings

The summary of findings included the survey and coded focus group results. The survey score distribution for attitude and confidence was homogenous and high, with high statistical scores for reliability. With regard to the research questions, the survey data demonstrated a probable correlation between high performing technology teachers and their adaptability to change, their willingness to embrace constructivist ideas, and their determination when confronted with obstacles. Additionally, the coded focus group data revealed recurring constructivist frameworks for student learning, classroom teaching, the learning community, and foundations. Together, these four frameworks formed an interconnected system built on constructivist tenets. These recurring tenets supported a constructivist culture that was collaborative and independent, receptive to individuals and valued their relationships,

replete with opportunities for distributed leadership, interconnected with integrated technology, populated with highly engaged and motivated individuals, self sustaining, safe and nonjudgmental, vision driven, built on authentic assessment and curriculum, and evolving at the speed of technology.

Barriers to these outcomes included high-stakes testing, district mandates, network failures, overcoming the fear of student expertise, and entry-level technophobia.

8. Conclusions

Research question one asked how novice and expert EDGE teachers perceive how technology changes teaching and learning in the classroom. The focus group data from both groups clearly demonstrated that the teacher participants' perception were technology does change teaching and learning in the classroom. The differences in their perceptions were interesting. The expert teachers described technology as an integrated part of the curriculum. They readily accepted the challenges incumbent on all EDGE teachers and recognized the advantages provided by an EDGE classroom.

The high survey scores achieved by both the expert and novice groups demonstrated a predisposition to utilize basic technology skills successfully. How this predisposition might have affected teacher perceptions is difficult to determine from the data collected.

Research question two asked what patterns of experiences emerged in the classroom when implementing technology. Careful attention was given to the method used to elicit the focus group teacher responses. During the discussion, the researcher avoided any reference to constructivism that might influence a teacher's response. Using Seidman's (2006) approach to coding the data, the discussion responses were separated into categories relevant to the research questions. These recurring categories and their underlying themes were then connected into patterns that were also recurring. The patterns demonstrated working models of student learning, classroom teaching, the learning community, and foundations. Within these models there were numerous supporting constructivist tenets.

Research question three asked how one could use technology to promote constructivist instructional practices. By reading the patterns chronologically from the inception of the program, "The Foundations Model", through "The Learning Community Model", "The Classroom Teaching Model", and "The Student Learning Model", cause is readily discernible, indicating that the technology program piloted in this district promoted constructivist instructional practices.

Research question four asked teachers to describe the major barriers they experienced when implementing technology into the curriculum. These ran the gamut from the fear of a student's superior expertise with a technology resource to a system- wide network failure that was completely out of the teacher's control. The teachers discussed the barriers they encountered including high-stakes testing, district mandates, network failures, overcoming the fear of student expertise, and entry-level technophobia. Most of the barriers could be attributed to a teacher's lack of experience or obsolete technology. Both of these barriers should be resolved with continuous mentoring and modern, robust technology solutions. In summary, the data collected from the teacher surveys and focus groups support the premise that elementary teachers' perceptions of technology are a catalyst for constructivist practices in the classroom.To conclude, teachers perceived technology implementation as a means for content delivery and research, and technology integration as a catalyst for holistic change to both teaching and learning.

Integrating technology in the classroom precipitated numerous patterns of experiences that revealed underlying systems that affected every aspect of teaching and learning. Finally, vision, knowledge, and integration are necessary to promote constructivist instructional practices in a One-to-One classroom.

9. Limitations

This is a qualitative study conducted in one public school district in Florida. The ability to generalize these findings to any other elementary school teachers becomes unrealistic under these specific circumstances. Even with member checking, coding helpers, and empirical readers, the researcher enters the study with biases. Complete objectivity in any study, including case studies, is all but impossible (Merriam, 1998).

10. Implications

The major implications of the study included the roles teachers and administrators play when integrating technology in a constructivist culture. 1. Technology can be used as a catalyst for classroom constructivist practices 2. Teachers believe that the use of technology supports improved student learning. 3. Training in constructivism promotes use of technology by teachers and speeds changing teaching pedagogy into constructivist practices. 4. Teachers' perceptions are an important part of the equation in changing pedagogy toward constructivism. 5. The school administration must support technology and constructivist teaching in the classroom. 6. Students and teachers can collaborate in designing, developing, and implementing their learning experiences and students can actually take control of their learning experiences. Recommendations for further research included the introduction of a constructivist practices primer for new One-to-One teachers and a meta-analysis leveraging the data being generated by One-to- One studies worldwide to create a statistically robust survey sample for inquiries into the efficacy of the model.

References

- Apple, M. & Beane, J. (1995). Democratic schools. Alexandria, VA: Association for Supervision and Curriculum Development.
-Blase, J. & Blase, J. (1998) Handbook of instructional leadership: How really good principals promote teaching and learning. Thousand Oaks, CA: Corwin Press.
- Brooks, M. G., & Brooks, J. G. (1999). The courage to be constructivist. Educational Leadership, 57(3), 18-24.
- Brooks, J. G., & Brooks, M. G. (2000). In search of understanding: The case for constructivist classrooms. Upper Saddle River, NJ: Prentice Hall.
- Isaacson, L. (2004). Teachers' perceptions of constructivism as an organizational change model: A case study. (Doctoral Dissertation). University of South Florida.
- Kagan, S. (1994). Cooperative learning. San Clemente: Resources for Teachers. Keegan, D.(1990). Foundations of distance education (2nd ed.). New York, NY: Routledge, Chapman and Hall, Inc.
- Lambert, L., Collay, M., Dietz, M., Richert, K., & Richert, A. (1997). Who will save our schools: Teachers as constructivist leaders. Thousand Oaks, CA: Corwin.

- Lambert, L. (2003). Leadership capacity for lasting school improvement. Alexandria, VA: Association for Supervision and Curriculum Development.

-Marlowe, B. A., & Page, M. (1998). Creating and sustaining the constructivists classroom. Thousand Oaks, CA: Corwin.

-Merriam, S. (1998). Qualitative research and case study applications in education. San Francisco: Jossey-Bass Publishers.

-Nanjappa, A., & Grant, M. (2003). Constructing on constructivism: The role of technology. Electronic Journal for the Integration of Technology in Education, 2(1), 38-56. Retrieved March, 2008 from the World Wide Web: http://ejite.isu.edu/Volume2No1/nanjappa.pdf

- Phillips, D. C. (2000). An opinioned account of the constructivist landscape. In D. C. Phillips (Ed.), Ninety-ninth Yearbook of the National Society for the Study of Education (pp. 1-16). Chicago, IL: University of Chicago Press.

-Seidman, I. (2006). Interviewing as qualitative research: A guide for researchers in education and the social sciences. New York, N.Y.: Teachers College Press.

- Shapiro, A. (2003). Case studies in constructivist leadership and teaching. Lanham, MD: Scarecrow.

- Shapiro, A. (2000). *Leadership for constructivist schools.* Lanham, MD: Scarecrow.