

A Study of the Application of Emerging Technology: Teacher and Student Perceptions of the Impact of One-to-One Laptop Computer Access

Rae Niles, Ed.D.*

Department of Educational Leadership, College of Education

Abstract. The purpose of this qualitative, embedded descriptive case study was to describe and identify Sedgwick High School's teacher and student perceptions of the impact of one-to-one laptop computer access using an appreciative inquiry theoretical research perspective and the theoretical frameworks of change and paradigm shift. Data were collected through focus groups, as well as administration of the Left-Hand Right-Hand Column Case Method (LHRHCCM). Data were analyzed using the comparative analysis matrix method. Analyzed data revealed six salient findings: (1) Students functioned in the capacity of teacher, (2) technology changed the way teachers and students communicated, (3) the culture of the classroom dynamics between teacher and student changed, (4) technology made learning enjoyable for students, (5) teachers and students believed immersion in a technology-rich learning environment created advantages for student success after high school graduation, and (6) teachers believed access to ubiquitous technology created new challenges for maintaining student engagement in the learning process. Five findings suggested technology had changed teaching and learning and helped to create a paradigm shift in the teacher and student roles. One finding revealed challenges.

1. Introduction

Teachers in the United States are in the midst of a paradigm shift that is affecting the teacher-teaching environment and the student-learning environment. As teachers struggle with traditional pedagogy, instructional practices, and disparities in student academic achievement, they face increasing criticism and pressure to promote an emphasis on preparing their students for the technology-rich 21st Century. Additionally, they face the challenge of readiness for emerging technology. Possessing openness to emerging technologies is critical for teachers in the technology-rich 21st Century as technology continues to accelerate at a rapid rate. Readiness for new technologies is a challenge associated with change. Teachers who resist change may impede and/or limit their students' learning and skills. Teachers, therefore, must prepare students by teaching knowledge and skills necessary for students to be successful in the technology-rich 21st Century.

This study employed an appreciative inquiry theoretical research perspective to describe the results of emerging technologies, based on teacher and student perceptions of the teaching and learning environments because of their involvement in a technology-rich school environment where students have access to wireless laptop computers. The study addressed the following overarching question: How does the application of readily accessible emerging technologies in classrooms affect teaching and learning?

2. Experiment, Results, Discussion, and Significance

Teacher and student perceptions of the impact of one-to-one laptop computer access were viewed through the theoretical frameworks of organizational change [1] and paradigm shift [2] followed by integration of the appreciative inquiry theoretical research perspective [3]. A qualitative embedded, descriptive case study applied the appreciative inquiry theoretical research perspective to describe and identify teacher and student perceptions of the impact of one-to-one laptop computer access during the fall of 2005. Appreciative inquiry is a theoretical research perspective that focuses on the optimistic nature of an organization and strives to reveal its "positive core" by focusing on "what works" in the organization. Embedded within the context of the study were two units of analysis: 13 teachers and 18 students in grades 10 through 12.

Four research questions guided this study: 1) How do teachers in a technology-rich high school environment describe the impact of one-to-one laptop computer access? 2) How do teachers in a technology-rich high school

environment describe the impact of one-to-one laptop computer access on student-learning? 3) How do students in a technology-rich high school environment describe the impact of one-to-one laptop computer access? 4) How do students in a technology-rich high school environment describe the impact of one-to-one laptop computer access on how their teachers teach?

In order to describe and identify teacher and student perceptions of the impact of one-to-one laptop computer access, the following methods were used: focus groups and the left- hand and right-hand column case method (LHRHCCM) [4]. All focus groups and the LHRHCCM were recorded and transcribed electronically. Data were analyzed by using the comparative analysis matrix method. A constant comparative analysis was used to identify patterns, code data, and categorize findings [5]. Data were analyzed using text analysis software and content analysis by sorting data into a series of matrices based on the study's theoretical perspectives.

3. Conclusions

Six salient findings were based on the analysis of data. 1) Data revealed that students functioned in the capacity of teacher. Students and teachers recognized the change that occurred, the paradigm shift from teacher to student as teacher, and a positive core of experiences identified by teachers and students when students functioned as the teacher. 2) Technology changed the communication patterns of teachers and students in several ways: They shared electronic conversations about academics and social or personal areas of interest. Electronic communication, including instant messaging, and email, created opportunities for teachers and students to interact outside the traditional teacher-student relationship. 3) Teachers and students believed the culture of the classroom dynamics between them changed through the use of technology. Individual, self-directed learning increased. Teachers and students acknowledged instructional practices for the teacher's role changed from imparter of knowledge to a facilitator. 4) Teachers and students believed technology made learning enjoyable for the student. An overarching element of enjoyment existed when technology was used. Students liked learning together and from one another. The novelty of learning with technology created opportunities for students to have fun and to feel pride in their work. 5) Immersion in a technology-rich learning environment created a belief among teachers and students that students could be successful and created an advantage for their success following high school graduation. 6) Access to technology creates distractive issues for both teachers and students.

Life in the technology-rich 21st Century requires a new literacy, one that relies more on a comprehensive understanding of the world and the skills necessary to live and work successfully in a global society. Technology and the changes associated with its exponential growth influences many facets of the global economy, society, and politics. Understanding the impact of technology on the teaching and learning process through the perceptions of teachers and students will help other educators who may be investigating one-to-one laptop computer access or the application of other emerging technology.

Teachers in the United States are in the midst of a paradigm shift crafted from the challenges associated with conflict created by the interaction of traditional pedagogy, instructional practices, and disparity in student academic achievement. They face increased challenges and pressures to promote an emphasis on preparing students for the technology-rich 21st Century. This research has the potential to influence school leaders who are seeking to understand the benefits associated with one-to-one laptop computer access by students. Moreover, it shows that teachers and students can work together to make one-to-one laptop computer initiatives successful.

4. Acknowledgements

I am very appreciative to my advisor, Dr. Ray Calabrese, and the members of my dissertation committee—Dr. Randy Ellsworth, Dr. Dennis Kear, Dr. Jean Patterson, Dr. Linda Roberts, and Dr. Randy Turk, for their time and interest in my dissertation.

[1] Schein, E. H. (1995). Kurt Lewin's change theory in the field and in the classroom: Notes toward a model of managed learning. Society for Organizational Learning. Retrieved June 1, 2004, from <http://www.solonline.org/static/research/workingpapers/10006.html>

[2] Kuhn, T. S. (1962). *The structure of scientific revolutions* (1st ed.). Chicago: The University of Chicago Press.

[3] Cooperrider, D.p L., & Srivastva, S. (1987). Appreciative inquiry in organizational life. *Research in Organizational Change and Development*, 1, 129-169.

[4] Argyris, C. (1999). *On organizational learning* (2nd ed.). Oxford, England: Blackwell.

[5] Miles, M., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage.