10-25-2013

Computer Lab Instruction in Elementary Schools: Time for Instructional Transformation or Worksheet Substitution?

Julia Kara-Soteriou
Central Connecticut State University, karaiou@ccsu.edu

Computer Lab Instruction in Elementary Schools:

Time for Instructional Transformation or Worksheet Substitution?

Julia Kara-Soteriou
Central Connecticut State University

Abstract

Lately, concerns are raised about the ways teachers integrate technology and about their students' digital literacy skills. Therefore, the purpose of this study was to investigate how elementary school teachers use their scheduled computer lab time. During this observational study emphasis was placed on the integration of literacy and technology and the extent to which integration supported the development of new literacies and promoted transformation of literacy tasks. The study took place in two elementary schools and included three weeks of daily observations in each of the schools. After the observations, interviews were conducted with teachers and school/district administrators.

Introduction

For many teachers the integration of technology has been central to their teaching (Eagleton, Guinee, & Langlais, 2003; Karchmer, Mallette, Kara-Soteriou, & Leu, 2005; Purcell, Heaps, Buchanan, & Friedrich, 2013). Lately, however, concerns are raised about the ways teachers integrate technology (Linckels et al., 2009) and about students' abilities to effectively participate in activities that require digital literacy skills (Purcell et al., 2012). Some researchers argue that often new technologies are simply reinforcing old ways of teaching and learning (Resnik, 2007) and describe the use of technology as "fitting it in" rather than as being used in more effective ways (Cartwright & Hammond, 2007).

Given that nowadays teachers have good access to educational technologies (Connecticut Association for Reading Research, 2008; Linckels et al., 2009), it is important to continue to

investigate how often these technologies are utilized and how their use encourages students to develop digital literacy skills. Therefore the purpose of my research was to study the extent to which the integration of literacy and technology moves beyond the "fitting in" to more transformational tasks. More specifically, my objectives were to investigate how elementary school teachers use the computer lab time, the extent to which traditional and new literacies skills are supported during this time, if the activities used are significantly modified because of the use of technology, and which factors teachers report as the reasons for using the computer lab the way they do.

Theoretical framework

The theoretical framework of the study draws from three areas of work: The first is the New Literacies of the Internet (Leu, Kinzer, Coiro, & Cammack, 2004), which guided me in evaluating if the integration of literacy and technology is done through activities that help students develop skills, strategies, and dispositions that are necessary when using technology. For instance, according to this framework, when students are asked to participate in Internet-based activities, they should be taught how to identify important questions, navigate through websites, locate relevant information, critically evaluate and synthesize information to form answers to those questions, and then effectively communicate the answers to others.

The second framework is based on the SAMR Model (Puentedura, 2012), which offers a method of showing a progression that adopters of educational technology often follow as they progress through teaching and learning with technology. Based on the SAMR model, adopters of educational technology usually go through four levels of technology tasks: Substitution, Augmentation, Modification, and Redefinition. According to Puentedura, technology-based

activities can either enhance or transform instruction. Enhancement of instruction is seeing by using technology to either substitute a task that included no technology before and have no functional change, or augment a task and have some functional improvement. In these cases, technology tasks fall under the substitution and augmentation categories. On the other hand, when technology tasks fall under the modification and redefinition categories, transformation of instruction can take place by using technology to significantly modify a task or by creating a new task that was inconceivable before without the use of technology.

Finally, as I try to understand what influences teachers' decisions when they integrate literacy and technology I draw from Mishra and Koehler's (2006) work on Technological Pedagogical Content Knowledge. In their model, Mishra and Koehler articulate the relationships between content, pedagogy, and technology. They describe each of these components in isolation, as well as in pairs (pedagogical content knowledge, which is similar to what Shulman [1986] described; technological content knowledge; technological pedagogical knowledge) and all three together (technological pedagogical content knowledge). The triad, in particular, represents a body of knowledge that is different from the knowledge held by a disciplinary expert, or the knowledge held by a technology expert, or the general pedagogical knowledge held by teachers from different disciplines. Rather, technological pedagogical content knowledge is seen as the basis of good teaching with technology as it promotes a transactional relationship between technology, pedagogy, and content with the objective to develop appropriate content-specific strategies and representations. A core argument in Mishra and Koehler's model is that there is no single technological solution that applies for every teacher, every course, and every pedagogical approach.

Methodology

Research questions:

(1) How often and what technologies do teachers use when they integrate literacy and technology in the computer lab?

(2) To what extent does the integration of literacy and technology support the development of new literacies and promote transformation of literacy tasks?

(3) What do teachers report as the reasons for using the computer lab the way they do?

Methods: This is an observational multicase-study (Bogdan & Biklen, 2003) that took place in two elementary schools (K-5) in two school districts in the Northeast USA. According to its Strategic School Profile (Connecticut State Department of Education, 2011a), School 1 is an urban school with 73.4% of its students receiving free or reduced-price meals and 34.3% being English Learners. In School 1, more than 80% of the students come from underrepresented groups (12.6% Black, 63.1% Hispanic, 2.7% Asian American, 0.6% American Indian, and 1.4% two or more races). The White students represent 19.6% of the student population. School 1 is committed to offering 36 hours per year of computer education and claims that 97% of its computers are high or moderate power computers. All computers in School 1 have Internet access.

School 2, on the other hand, is a suburban school with approximately 30% students on free or reduced-price meals and 5% English Learners (Connecticut State Department of Education, 2011b). The student population consists of approximately 50% White, 17% Black, 16% Asian American, 12% Hispanic, less than 1% American Indian, and 4.5% two or more

4

races. All computers in School 2 have Internet access and the school is committed to offering 27 hours of computer education per week.

In each school I observed how the computer lab was used during the school day (9:00am-3:25pm). I observed daily for three to five weeks and a total of 15 full days in each school. Before, during, and after the completion of the lab observations, I invited all the teachers who used the computer lab and selected administrators in the schools/districts to participate in individual interviews; a few accepted the invitation and I interviewed them after I completed the observations. During the teacher interviews we discussed the reasons for integrating literacy and technology the way they did, their technological pedagogical content knowledge (Mishra & Koehler, 2006), and the support/challenges that influence their decisions to use the computer lab in a particular way. After I completed the teacher interviews I conducted interviews with the technology coordinator in the district where School 1 is located and the Assistant Superintendent for School 2. The objective for the administrator interviews was to triangulate the information shared by teachers and to learn more about the school/district context that might be influencing the application of new literacies by teachers.

Data sources: I used an *observation protocol* to document the instruction that takes place in the computer lab. The observation protocol included information about the students (grade level, numbers, and gender), the adults who accompany the students to the computer lab (classroom teacher, parent volunteer, paraprofessional), the technologies used in the computer lab, and detailed description of the lesson in the computer lab when technology is used. I used the *researchers' journal entries* to document any information that should not have been included in the observation protocol, such as interactions with students/adults at the school, comments from

teachers/paraprofessionals regarding technology access/materials at the school, observations of student/adult behaviors during instruction when technology is used, and descriptions of computer lab. Further, I used a *teacher interview protocol* to gather information from the teachers about the reasons they choose to integrate literacy and technology the way they do and an *administrator interview protocol* for the interviews with the school/district administrators regarding the school/district policy on technology integration. Moreover, I collected *district/school documents* to supplement information about the school/district technology plan and *student and teacher technology artifacts* to use as sources of information on the types of technology-based activities applied by teachers.

Results

I completed the computer lab observations in early June and the interviews in early July. Preliminary data analysis aiming to answer research question 1 (How often and what technologies do teachers use when they integrate literacy and technology in the computer lab?) revealed differences between the two schools' frequency and patterns of use of the computer lab. The computer lab in School 1 was used daily from 9:05am to 2:30pm. Teachers from all grade levels were scheduled to use it for 30 minutes and they rarely cancelled their computer lab time. If a teacher did cancel, the paraprofessional who was working permanently in the lab to support the teachers would call other teachers and ask if they wanted to take advantage of the "free" lab. In School 2, however, the computer lab was used infrequently. Even though there was a posted schedule outside the computer lab, not all teachers followed it. The fifth grade teachers, for example, never used the computer lab during the five weeks I observed at their school. Further, there were several open time blocks for teachers to use the computer lab but only one teacher

took advantage of these time blocks and only twice during the observation period. On certain days, the computer lab was not used at all or was only used by one teacher for 30 minutes.

The preliminary data analysis also revealed that the most frequently used technologies were the computer and online programs that were either purchased by the district or were free to use from certain websites. School 1 made use of software that the district purchased in order for teachers to supplement instruction and informal assessment in reading/language arts and math. School 1 also used online resources that the students could access only through the district's website. Rarely did students use the Internet to do research (only a fifth grade teacher did that) or play free educational or other games. School 1 also made use of headphones every time students were in the lab because the work students were assigned to was individualized for the most part. When the assigned work was not structured the students still used headphones as a way to keep them focused on their work and avoid talking with each other.

School 2 mostly used the lab's computers and online resources but in a different way than School 1. School 2 used some educational websites (i.e., Starfall.com) for K-1 students to practice literacy and math skills and some other "school appropriate" websites for students in grades 1-2 to play games that were not necessarily educational. For the most part, students in grades 3-4 used a few websites to play games that had no connection with what was going on in their classrooms and did not improve the students' technological knowledge as the only skills required were to press the arrow keys and move the mouse (skills that students had developed in previous years). Students in these grade levels also used typing software that the school had purchased and installed in the computer lab. No other programs were used (i.e., word processing or digital video), even though they were available.

In response to research question 2 (To what extent does the integration of literacy and technology support the development of new literacies and promote transformation of literacy tasks?) data analysis reflected frequent integration of literacy and technology in School 1 but not in School 2. In School 2 the computer lab time was treated as time to reward students for behaviors exhibited in the general education classroom by allowing them to play online games. Therefore, rarely did teachers use the lab to teach/reinforce literacy or other subject areas. Even when the kindergarteners were playing literacy-based online games the parent volunteers who accompanied them in the lab did not interact with the students in order to enhance their literacy skills.

During the times when School 1 and School 2 integrated literacy and technology, the application of technology tasks fell mostly under the Substitution and Augmentation categories of the SAMR Model. Examples of these tasks included printing out a test and asking students to respond to it independently (Substitution) or instructing students to use software that looked like colored worksheets with animation (Augmentation). The latter was the most frequently used technology task in School 1. Other examples of Augmentation tasks included the use of the Starfall.com literacy games by the kindergarten and first grade students, as well as the typing software by the third and fourth graders in School 2.

In the two schools only one 5th and one 3rd grade teacher asked their students to conduct Internet searches. These tasks fell under the Modification level of the SAMR Model (Puentedura, 2012) because they allowed for significant modification of the research activity (instead of students using a few traditional resources from a library, they had access to hundreds of online resources and the online search itself was very different from the search done through a book). These tasks, however, were not accompanied by the teaching or reinforcement of new literacies

skills (Leu et al., 2004). For instance, students were not reminded of efficient and effective ways to search for, locate, review, and synthesize information. The teacher, while in the computer lab, did not provide any of this information either to the whole class or individually when the students worked on their projects and were clearly unable to choose the most useful and trustworthy websites or choose the most appropriate information and paraphrase it for their report.

Only seven teachers from School 1 and one teacher from School 2 volunteered to participate in the interviews and discuss their reasons for using the computer lab the way they did. In School 1 all teachers reported that they were using software to supplement their published reading program because it was a district requirement. They all liked the literacy software because it allowed them to individualize instruction and it kept track of the students' performance. None of the teachers was familiar with the term New Literacies and none was satisfied with the professional development offered in the area of technology integration. They all said that the professional development offered with respect to technology only related to software that accompanied their textbooks or assessments and that they would like to learn more about how to integrate literacy and technology. All interviewees complained about the slow Internet access, the lack of projector in the computer lab, and the unpredictability of the computers in the lab.

On the other hand, the administrators and technology coordinators who participated in the interviews reported that professional development on the integration of technology has been offered many times and they revealed their frustration at the teachers' unwillingness to use the computer lab (and their classrooms' computers) in a more transformative way. While they admitted that Internet access is slow and that technology support is not available in every school

and within a reasonable amount of time, they reiterated that teachers could be using the computer lab to teach any of the content areas in a more creative way instead of doing worksheet-like activities or allowing students to play online games that are unrelated to the school's curriculum.

Conclusions

My preliminary data analysis revealed that many elementary school teachers either avoid using the computer lab or when they do use it they do not teach new literacies and do not try to transform instruction by creating new tasks that were inconceivable without the use of technology. Further, teachers who are not aware of the new literacies of the Internet, or other theoretical models on the application of technology tasks, consider the substitution and augmentation type tasks appropriate, justify them as "district requirements" and do not consider the transformational uses of technology that could enhance literacy instruction. Also, teachers who use the computer lab as reward for good behavior instead as a way to integrate technology and the content areas blame it on the lack of funding and the slow computers.

I am still working on collecting additional information (i.e., district documents/resources) to better understand the data from the observations and the interviews. Further data analysis will shed more light on how computer labs are used in elementary schools and the type of professional development needed in order for teachers to integrate literacy and technology in a transformative way.

References

Bogden, R. C., & Biklen, S. K. (2003). *Qualitative research for education*. Boston: Allyn and
    Bacon.

Cartwright, V., & Hammond, M. (2007). 'Fitting it in': A study exploring ICT use in a UK
    primary school. *Australasian Journal of Educational Technology (Online Edition), 23*,
    390–407.

Connecticut Association for Reading Research. (2008). *Connecticut high school teachers'*
    knowledge, needs, and expertise in teaching the New Literacies of the Internet and other
    technologies. Farmington, CT: Author.

Connecticut State Department of Education. (2011a). *Strategic school profile 2010-11: School 1*.
    Retrieved February 12, 2013, from http://sdeportal.ct.gov/Cedar/WEB/
    ResearchandReports/SSPReports.aspx

Connecticut State Department of Education. (2011b). *Strategic school profile 2010-11: School 2*.
    Retrieved February 12, 2013, from http://sdeportal.ct.gov/Cedar/WEB/
    ResearchandReports/SSPReports.aspx

Eagleton, M. B., Guinee, K., & Langlais, K. (2003). Teaching Internet literacy strategies: The
    hero inquiry project. *Voices from the Middle, 10*, 28-35.

Karchmer, R. A., Mallette, M. H., Kara-Soteriou, J., & Leu, D. J., Jr. (Eds.) (2005). *Innovative*
    approaches to literacy education: Using the Internet to support new literacies. Newark,
    DE: International Reading Association.

Leu, D. J., Kinzer, C. K., Coiro, J., & Cammack, D. (2004). *Toward a theory of new literacies*
    emerging from the Internet and other Information and Communication Technologies.
    Retrieved February 26, 2005, from http://www.readingonline.org/newliteracies/
    lit_index.asp?HREF=/newliteracies/leu

Linckels, S., Kreis, Y., Reuter, R., Dording, C., Weber, C., & Meinel, C. (2009). *Teaching with*
    information and communication technologies: Preliminary results of a large-scale
    survey. Conference paper at the SIGUCCS Fall Conference, October 11-14, in St. Louis,
    Missouri, USA.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A
    framework for teacher knowledge. *Teachers College Record, 108*(6), 1017-1054.

Puentedura, R. (2012). *The SAMR Model: Background and exemplars*. Available at
    http://www.hippasus.com/rrpweblog/archives/000073.html

Purcell, K., Heaps, A., Buchanan, J., & Friedrich, L. (2013). *How teachers are using technology*

at home and in their classrooms: Pew Internet & American Life Project, February 28, 2013, http://www.pewinternet.org/Reports/2013/Teachers-and-technology.aspx, accessed on March 1, 2013.

Purcell, K., Rainie, L., Heaps, A., Buchanan, J., Friedrich, L., Jacklin, A., Chen, C., & Zickuhr, K. (2012). *How teens do research in the digital world: Pew Internet & American Life Project*, November 1, 2012, http://www.pewinternet.org/Reports/2012/Student-Research.aspx, accessed on February 28, 2013.

Resnick, M. (2007). Sowing the seeds for a more creative society. *Learning and Leading with Technology, 35*, 18.

Shulman, L. S. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher, 15*(2), 4–14.