PROSPECTIVE TEACHERS' SELF-EFFICACY FOR TECHNOLOGY INTEGRATION: EFFECTS OF AN EXPERIENTIAL METHOD

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Abstract

There has been a growing interest in the use of computers and computer-related technology in second/foreign language teaching and learning. However, few teachers are observed to be integrating emerging educational technology into their teaching despite the increased availability and support for classroom computer use (Debevec, Shih, & Kashyap, 2006). Teachers' beliefs in their capacity to work effectively with technology, i.e., their self-efficacy, was found to be a significant factor in determining patterns of classroom computer use (Albion 1999; Oliver & Shapiro, 1993). The aim of the present study is to investigate whether integration of technology into lesson presentations would affect the computer self-efficacy beliefs of 73 Turkish prospective teachers (PTs) of English. Data collected from the Self-efficacy for Technology Integration Questionnaire (Wang, Ertmer and Newby, 2004) and semi-structured interviews revealed that integrating technology into lesson presentations affected the self-efficacy beliefs of Turkish PTs of English towards technology integration.

Keywords- Self-efficacy beliefs, technology integration, preservice teacher education

1. Introduction

With advancements in information technology, there has been a growing interest in the use of computers and computer-related technology in second/foreign language teaching and learning. However, despite the positive effects of technology use on student motivation, self-direction, sense of accomplishment and critical thinking skills (Van Scoter, Ellis & Railsback, 2001), and increased availability and support for classroom computer use, many higher education instructors are observed not to be integrating emerging educational technology in the classroom (Debevec, Shih, & Kashyap, 2006). Among other factors, e.g., the nature of curriculum, personal capabilities and external constraints, teachers' beliefs in their capacity to work effectively with technology, i.e., their self-efficacy for technology integration was found to be a significant factor in determining patterns of classroom computer use (Albion 1996, 1999; Compeau, Higgins & Huff, 1999; Oliver & Shapiro, 1993).

The construct of self efficacy has come into existence as part of Bandura's (1977) social cognitive theory. According to Bandura (1988) the way one judges his own capability to perform a specific task is a strong predictor of his capabilities to perform that task. When applied to using computers in the classroom environment, teachers who had high levels of efficacy for teaching with technology were found to expend more effort and persist longer on technology related tasks than teachers with low self efficacy. Thus, computer self-efficacy has repeatedly been reported as a major factor in understanding the frequency and success with which individual use computers (Piper 2000, van horn, 2006, Watson 2006). Watson examined years of teaching experience, type of school,

technical support and professional development as factors affecting computer self efficacy and found that professional development was a positive predictor. Hsu (2004) and Piper (2000) furthermore found that teachers who lacked confidence in using computers in their work were likely to avoid them altogether. Hakverdi's (2005) also study revealed that personal self efficacy was related to the science teachers' level of computer use, suggesting that computer use is dependent on perceived abilities at using computers.

On the other hand, studies have shown that technology education in pre-service teacher education is still not adequate and that pre-service teachers hesitate when asked to use technology and integrate technology into their instruction (Gürşimşek, Kaptan & Erkan, 1997; Yıldırım, 2000) even though they are witnessing continuous change in the use of computers as technology advances and new applications become available. Preservice teachers with lower computer self efficacy are found to be more likely to have problems with technology integration and have problems integrating technology into their own classroom when they exit teacher education programs and start teaching in their own classrooms (Wall, 2004). A recent study carried out by Wang, Ertmer and Newby (2004) has shown that the use of vicarious learning experiences and the incorporation of specific goals positively affected preservice teachers' self efficacy beliefs and the effective technology use within their own classrooms. Based on the results researchers claim that both computer self-efficacy and technology training had an effect on the degree of technology integration in the classroom, with teachers with higher levels of computer self-efficacy also having higher levels of technological integration, and teachers with more positive perceptions of the value of technological training had higher levels of technology integration.

Thus, the present study aims to investigate whether integration of technology into lesson presentations would affect the computer self-efficacy beliefs of Turkish prospective teachers of English.

2. Methodology

2.1. Participants

The participants of the study were 73 PTs enrolled in the ELT department of a state university in Turkey. All participants, 23 male and 50 female, were second year students who had already taken two computer courses in their freshman year. The average age of the students was 19.4 and they were randomly chosen from four intact groups of students.

2.2. Procedure

The present study took place in the second term of 2008-2009 academic year in the 12-week methodology course. The course aimed to provide PTs with knowledge on teaching skills in L2 while experiencing the use of technology. During the term, PTs learned how to teach four language skills effectively and how technology can support the language instruction and students' learning. More specifically, the course was conducted as follows: In the first three weeks of the course, PTs were given information on the uses of technology in second language teaching and how technology and second language acquisition theory and pedagogy developed in parallel directions. The focus was especially on Communicative Language Teaching with the support of technology.

The following weeks focused on the use of technology to facilitate the acquisition of language skills, beginning with the oral communication skills, i.e., listening and speaking and pronunciation and continuing with reading and writing skills. The aim was to examine the processes involved in the development of oral communication and reading and writing skills and to investigate how technology can assist the learner in acquiring these skills.

The collaborative projects began following the fourth week. PTs worked with their friends collaboratively in groups of four and prepared 20-minute lessons on teaching different language skills by integrating technological tools such as podcasts, blogs, wikis, e-mails, webquests, websites, concordancer, etc. While doing so, they were told to consider a particular group of learners, i.e., age and proficiency level, anticipate potential problems and think of solutions for each. During the preparation process, PTs also received some support from their instructor (one of the researcher of the present article). During their presentation, PTs assumed that their peers were the students that their lessons were aimed at. After each presentation, group members received feedback from the peers. Most of the feedback focused on whether the goal of the lesson was met, whether the lesson was suitable and stimulating for the intended group of learners and relevant to their needs as well as suggested ways to improve the presentation.

2.3. Data Collection and Analysis

Data for the present study was collected by means of a questionnaire developed by Wang, Ertmer and Newby (2004). The questionnaire with 21 items aimed to measure PTs' self-efficacy beliefs for technology integration into their future classes. PTs were asked to indicate the extent to which they agree with the statements related to their self-confidence regarding technology use on a 5-point Likert scale ranging from 5 (strongly agree) to 1 (strongly disagree). The questionnaire was piloted with 30 PTs in the same institution. The Cronbach alpha reliability coefficient for the present study was .89 while it was .94 for the study of Wang, Ertmer and Newby (2004). Example items from the questionnaire are "I feel confident that I can successfully teach relevant subject content with appropriate use of technology" and "I feel confident I can be responsive to students' needs during computer use."

Semi-structured interviews were conducted with ten PTs after the study, to gather in-depth information about the factors affecting their efficacy beliefs. Each interview session lasted between 10-15 minutes. Data from semi-structured interviews were analyzed by means of pattern coding as suggested by Miles and Huberman (1994).

3. Results and Discussion

3.1. Results of the questionnaire

A paired-samples t-test was conducted to evaluate the effect of the methodology course based on teaching skills using technology on the self-efficacy beliefs of PTs of English towards technology integration. Results of the t-test revealed a significant change in the pre- and post-test scores indicating that PTs developed more positive self-efficacy beliefs for technology integration (see Table 1). The eta squared statistic (.37) indicated a large effect size.

Table 1: Self-efficacy beliefs of PTs for technology integration

Test	M	SD	df	t	p a
Pre	73.80	11.71	72	-6.469	.000
Post	83.04	8.97			

a $p<0.05$

3.2. Interviews

PTs were interviewed at the end of the study to find out the factors affecting their self-efficacy beliefs for technology integration. In the first question, PTs were asked how competent they felt for integrating technology into their teaching and asked to indicate the factors affecting their competence. Eight PTs out of 10 mentioned that they felt competent while two stated they still did not. The PTs who felt competent gave the following responses to explain the factors affecting their self-efficacy:

> I have always been confident about using computers because I have had a computer for a long time and, as a student, I have done lots of assignments using computers. At the beginning of the term, I thought being good at computers would be enough to use it for educational purposes. However, I later realized how much I have learned about the technological tools that can be used for language teaching. Now, I can use them in my future classes.

> At the beginning of the term, when I checked the syllabus, I thought that I had known about the technological tools that were listed for teaching language skills. I knew them but I did not know how they would support the teaching and learning process of language learners. However, when I prepared and presented a lesson integrating one of these technologies and

when I watched my friends' presentations I understood that I now can use technology effectively in my future classes.

The PTs who stated not to be too competent about technology integration gave the following responses:

I don't think I would feel very comfortable if I started teaching today. The technology I use in my daily life is just limited to email and chat. For the other technological tools that can be used for language teaching, I need more experience.

I don't feel confident about using the technological tools we studied during the course because I did not have hands-on experience for all tools except the one I used for my own presentation. For the others, only watching my friends' presentation was not enough for me.

In the second question, the PTs were asked to what extent this course prepares them to integrate technology in their future classes. The following responses were given:

I learned about blogs, webquests and many other technological tools that I haven't heard before. What is more important, I learned how each tool can support the teaching and learning of a certain language skill, i.e., reading, writing, speaking and listening. I think this course provided us with an opportunity to learn about these tools and also to use them in actual teaching situation. This way we learned how we can teach a certain skill more effectively with the support of technology.

During the course, our main focus was on teaching language skills rather than technology. We learned that teaching skills was our focus not technology. It was only our tool to reach our aim. Knowing this helped us not lose our focus during our presentations. When I graduate, I think I can easily decide which tool I should use with which language skill.

The collaborative project that we carried out during the course, I think, was the most important part of the lesson that prepared me for my future teaching profession. It was the first time I was introduced to a number of technological tools so it was not easy to learn how we can use them for skills teaching. In our presentation, for example, we opened a blog to support a group of learners' writing skills. I learned a lot from that project but without the help of my friends I wouldn't have managed it.

I know that receiving such a course will provide me with a very big advantage when I become a teacher. Today's children are 'digital natives' and they will expect their teachers to use technology in their instruction. I feel so lucky that with the help of this course I support the language teaching process of my future students with technology.

While answering these questions, many PTs also mentioned the role of the instructor as one of the factors affecting their efficacy beliefs. The following comments illustrate their points:

The instructor provided us with guidance during our presentation preparation process. When we had some problems with the technological tool we had to integrate into our lesson we met her and we solved the problem together. This way I felt comfortable using technology during our presentation.

Carrying out such as project would be too difficult for us without the help of our instructor. Prior to the presentation of each group, we had a meeting with her. We did brainstorming all together. Most of our discussions were based on the way of integration of the technological tool that we were supposed to use and at which stage of the lesson the technology should be integrated. We learned a lot during these meetings and we saw alternative ways of integrating technology. These meetings have a very important role in developing my self-efficacy for technology integration.

Finally, PTs were asked whether they were planning to integrate technology into their future classes and why. Here are some of their responses:

> I am definitely planning to integrate technology into my future classes because using technology is fun, practical and time-saving. Moreover, I believe that, in a few years, technology use will be kind of obligatory. Thus, technology will be an important part of my classes.

> Lessons with technology support will me more effective. For example, I can't now consider a writing lesson without technology. I can't ignore the advantages provided by technology for writing skills. For example, blogs and wikis provide learners with authentic audience. Thus, I will use technological tools to teach English.

4. Conclusion

The present study indicated that integrating technology into lesson presentations affected the computer self-efficacy beliefs of Turkish prospective teachers of English. The findings of the self-efficacy beliefs questionnaire showed that there was a statistically significant increase in the self-efficacy scores of the PTs after the study. The semi-structured interviews conducted after the study revealed the factors affecting PTs' self-efficacy beliefs.

According to Bandura (1986) self-efficacy beliefs develop in response to four sources of information. "Enactive experience," i.e., self-efficacy for a behavior is increased by successfully performing the behavior, and "vicarious experience," i.e., other similar people are seen to perform a behavior successfully, are the most powerful sources influencing self-efficacy. A third source of influence is "verbal persuasion" which can encourage efforts that are more likely to increase efficacy through success, and finally physiological and affective states such as stress. In our study, the PTs had both enactive and vicarious experiences as they both taught a lesson integrating technology and observing their peers' presentations. Moreover, their stress level was lowered by the support they received from their instructor during the preparation process of their presentations and by working in groups rather than working individually. Thus, this study provided support for the positive effects of enactive and vicarious experience as well as low stress level on increasing teachers' self-efficacy for technology integration.

Teachers' self-efficacy beliefs have been found to be useful indicators of likely success at technology integration (Olivier & Shapiro, 1993) and the perceived self-efficacy beliefs of teachers have been found to be correlating significantly with reported hours of in-class use of technology (Whitehead, 2002). The ideal method for developing pre-service teachers' self-efficacy for technology integration would be, then, to provide them with training, practice and support to work successfully with technology in their classrooms.

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