Classroom Teacher Candidates' Definitions and Beliefs about Technology Integration

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Abstract—The purpose of this paper is to present teacher candidates' beliefs about technology integration in their field of study, which is classroom teaching in this case. The study was conducted among the first year students in college of education in Turkey. This study is based on both quantitative and qualitative data. For the quantitative data' Likert scale was used and for the qualitative data pattern matching was employed. The primary findings showed that students defined educational technology as technologies that improve learning with their visual, easily accessible, and productive features. They also believe these technologies could affect their future students' learning positively.

Keywords—educational technology, classroom teacher candidates, technology integration, teacher education

I. INTRODUCTION

FORMAL education has been discussed for centuries and there have been always new theories and methods proposed to develop educational systems. Some of these proposals were implemented locally where some implemented globally for decades. For examples, behaviorism was accepted the main learning theory for years in most of the educational systems where constructivism has become dominant in the last decades. Consequently, teacher education has been also shaped based on the learning approached that is believed in.

The education system in Turkey has a current shift from behaviorism to constructivism, which has been a strong influence on teacher education [1]. The number of college of education has been growing with additional majors. Similar to many developed countries, teacher preparation programs in Turkey are four year long including pedagogic courses and core subject courses.

In the meantime, the development of the technology has been affecting almost all work types and disciplines. Especially with the use of the Internet, schools started to add computers to the classroom to access World Wide Web. Thus, replacing traditional teaching methods with new teaching methods that includes technology is inevitable. However, how technology should be integrated into the lessons for improvement of learning is still a vital question among researchers and educators.

For a better use of technology in classrooms, educators in the field and educational organizations are suggesting to require teachers to have certain technology skills before

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starting teaching. For example, International Society for Technology in Education (ISTE) is recommending teacher candidates to have certain skills in technology and to be able to integrate these skills in to their lessons. In addition, some school districts also ask teachers to prepare students for the challenges of the 21st century which requires students to use technology for higher-order skills and self learning.

The schools in Turkey also have started to add computers into the classroom for educational purposes. In the last few years, the National Ministry of Education also endorsed the idea that every teacher should have a computer [2]. With the support from businesses, most Turkish schools opened computer labs. Most importantly, it was found that the current teacher candidates are more familiar with technology. However, that brings up a new issue that whether these teacher candidates will be able to integrate technology effectively in their lessons. Since teacher candidates are in the phase that they shape their teaching methodology, it is crucial to investigate how these candidates are defining technology integration for their lessons and what are their beliefs about the integration.

II. REVIEW OF THE LITERATURE

After the use of technology in classroom, researches conducted quantitative and qualitative studies to find the effectiveness of the new technologies on education. Some studies focused on the students' achievements [3,4,5], some examined students' motivations [6,7], and some investigated the teachers' perceptions on use of technology in lessons [8,9,10]. Most of these researchers specifically look for a subject area and how technology could be used in this subject teaching.

The operational definition of technology integration or the use of technology for education has been discussed differently by the researchers. Some researchers believed that technology integration is using technology as a tool in classroom where some argued that it is using technology as a part of new teaching strategy. Based on the study [8], most teachers' attitudes toward the integration of technology into classrooms are tended to be based on a 'tool' approach. Teachers used technology to prepare instructional material and to assess students' performance. Kuo also sees technology as a supplementary tool for education and emphasized that technology has a role of medium that still requires learning strategies, teaching approaches, and pedagogical philosophies [11].

On the other hand, researchers who think technology as a learning strategy in lessons believe that technology should be transparently integrated for a better learning [4]. In order to develop skills, teachers are suggested to use technology as an

instructional strategy [5]. Differently, Ivers found that teachers who were self-confident in most subject areas tended to integrate technology in most area and these teachers used technology not only as a teaching tool but also as an instructional tool for students [9]. Teachers with less self confidence tended to use technology as a teaching tool. Schoepp stated that a lack of incentive and a lack of vision as to how to integrate technology were some perceptions that hindered integration [10].

The theoretical framework of this study, rooted from Bandura's Social Cognitive Theory, is based on the idea that teachers' backgrounds, beliefs, and previous experiences play an important role in their determining behavior [11]. Similar to that Technology Acceptance Model also points that teachers' internal perception about a technology program will determine his or her intention to use the program or not and result out different learning outcomes [11]. In this study, we also look how their previous experiences affect their determination of technology integration.

In sum, the previous studies have explored and examined teachers' views and perceptions about technology integration. However, the classroom teachers who hold more responsibilities comparing to other teachers –teaching more than one subject area- were not studies well enough [12]. Indeed, after each year there have been new technologies in classroom and these new technologies may affect teacher candidates' beliefs about integrations. Teacher candidates in these days are coming to classroom with more prior skills in technology and this could make changes on their opinions about use of technology. Thus, this study was found necessary to be conducted. The main research questions are;

1. How classroom teacher candidates define use of technology in classroom?
2. How existing experience affect teacher candidates beliefs about use of technology in classroom?

III. METHOD AND DATA ANALYSIS

This study examined quantitatively how the classroom teacher candidates with different technology skills perceived technology in classroom, and explored qualitatively how these candidates define the terms; technology integration and technology-based education. The samples of the study are 30 first year students from classroom teacher major and they were in their second semester at the Erciyes University where most of its students have to score above average at University Entrance Exam.

The survey instrument had two main sections; self-report survey questions about teachers' technology skills and their perception about technology integration in primary education classrooms. The questions about their technology skills were exploring the students' skills in basic computing, office programs, and social networking applications. The technology skill questions were prepared by the researchers, but the other questions were generated from the previous studies. The questions in this second part were structured as a Likert scale, and responses were scored from 1=SD to 5=SA.

In addition, the researchers of this study also collected qualitative data that were open-ended questions and classroom observations. The students were asked to respond to these open-ended questions online and these questions were asking how they define the terms technology based education and technology integration. The classroom observations were taken in to consideration because of the students' expression and informal comments for the use of technology for their future classrooms.

For the analysis, each data sources were use separately but connected to each other to come conclusion. The students' responses about their technology skills, for example, were evaluated separately but helped the researcher categorize the students beliefs based on their skill levels. Based on these categories, the students' responses for the questions on their beliefs were analyzed. For the qualitative data analysis Yin's pattern-matching technique was employed [13]. Pattern-matching logic is the specific technique used for within-case and across-case analysis. Pattern-matching compares a theoretical-based pattern with an empirically based pattern [13]. Thus, this helped the researchers to determine constructs which are representations of the students' beliefs about their definition for technology integration.

IV. RESULTS

The results of this study are based on analysis of both quantitative and qualitative data. First of all, the self-reported survey questions show students' prior experiences with certain technology skills. Then, there are qualitative data describing how the students defined technology integration. At the last part of this result section, Likert scale survey results were analyzed with the observation and students comments about their definitions.

Prior to this study, almost all of the students took Computer I course which cover Office Word and PowerPoint applications and basic Windows functions. According the primary results, 10% of the students mentioned that they use computers once a month, 30% of them use few times a week and the rest of the class use computers on daily basis. The students were also asked how they feel about their computer skills; 30% thought they do not know much about it, 36% "so so" 26% "as much as I need it" and 8% "I am good at it".

It was revealed that 30% of the participants do not have an account for a social network site (such as Facebook) and none of the students have a Twitter account. Even though most of the students mentioned that they have used Wikipedia for accessing information but none has added information on any wiki site. Only two students reported that they used a blog before. However, all the students indicated that they use Word processor for certain basis.

Based on the qualitative data sources of this study, there are some themes emerged. After reading and coding the students' comments about technology integration, the researchers agreed on these themes and the themes are rechecked for its evidences. Some of the main themes that most of the students mentioned about in their explanations and comments were (a) visualization of technology, (b) accessibility of information, (c) new trend for the century, and (d) the usefulness for material development.

When these classroom teacher candidates were trying to define and explain technology integration, most of them highlighted the visual components of the new technologies and how these features could affect learning. Connecting with their future classroom environment, the common point they made was that the students at elementary age are not able to imagine enough, but their visual learning skills are stronger. Because of this visualization, they think, students can learn better. Thus, they believed using technologies with visual components is makes technology integrated into education.

Accessing information also appeared in most of the students' explanation about technology integration. The students mentioned that with the Internet, their future students and they would be able to easily access information about almost anything. Indeed, some students added that reaching information with technology in a short time can help them to study more. The following text was part of a student's response;

"...in current century, people cannot be without computers. Since technology development is very fast, that is also making new changes in our life styles. For example, when a teacher teaches something in the classroom, at the same time he or she can reach all the students instantly. With the technology based education, our education become more productive. With educational technologies, students are now able to access any information from anywhere and at anytime." [Translated from Turkish].

It was also mentioned in most of the students' responses to open-ended questions that new technologies are important in the new century and therefore it has to be part of the education as well. In other words, the students believe that education has to follow the trend of technology. It was evidence in the students' responses that technology-based education is necessary for their future students to be part of modern world. However, none of these teacher candidates provide any rationale or cause about how education with technology could help students become modernized. The following text was part of a student's response;

"[*Technology based education*] *means that using technology for a long-life and effective learning. Within this method, education becomes student-center and the focus is on students. And, this helps us keep up with the modern world..."* [Translated from Turkish].

The teacher candidates also brought up another usefulness of technology in education as tool to easily develop teaching materials. The students believe that educational technology means that with new computers, as a teacher, they can build more effective teaching materials for their classrooms and their students can learn better.

The survey results showed all students (except one) believed that using PowerPoint in classroom teaching could affect students' learning positively. These responses also support their comments about the using technology in education because of its visual feature. The responses to another questions show that 87% of students think that they can use more teaching strategies when there is a technology device in classroom. However, some students (13%) think that technology is distractive for them and they cannot concentrate enough on learning task.

V. DISCUSSION AND CONCLUSION

The results of this study showed that the teacher candidates in this case are able to define the operational definition of the term of technology integration in various ways. Based on their technology skills and their experiences with technology-based lessons, they are able to determine how technology could be used in education effectively. Consequently, their skills and experiences with technology also lead their beliefs about the usability of technology in education.

In addition, the teacher candidates' explanations for technology integration fit into the definition by the previous studies. Consisted with some previous studies [4,5,9], it can also be exposed from the results of this study that most of the students sees technology as a part of teaching strategy to improve students' learning. However, these teacher candidates rarely mentioned how technology could help their future students conceptualize their thinking. None of participant mentioned about the collaboration that technology could bring to education. This could be a result of their least experiences with social networking sites since it is not part of the curriculum of the required computer courses. Thus, teacher education programs should let these candidates to explore these sites for educational purposes.

In conclusion, it has to be acceptable that integrating technology in classroom is still new and it may take time to change the culture of teaching that teacher candidates may be experienced from their school year teachers. Thus, this study explored and examined how they define technology integration and how they perceive the effect of this integration in their future. It is believe that the results of this study could help teacher education programs to reevaluate the content of their computer courses and to provide more options for students to try out new technologies.

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