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The Effect of Digital Story Preparation on Technological Pedagogical Content Knowledge (TPCK) Self-confidence

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ABSTRACT The effect of the prospective pre-school teachers' digital story preparation on their technological pedagogical content knowledge self-confidence is proposed to be determined in mix method designed study. During the research, prospective pre-school teachers determined their objectives for a digital story, wrote scenarios, selected audio and visual materials, created and presented their digital stories. The qualitative and quantitative data were obtained through technological pedagogical content knowledge self-confidence scale and open-ended metaphorical question as pre- and post-tests. In quantitative and qualitative data analysis, t-test for the dependant samples and inductive content analysis were conducted. The findings demonstrated the prospective pre-school teachers' digital story preperation increased their self-confidence on TPCK. It was inferred from the metaphors that the prospective pre-school teachers perceived self-confidence on TPCK as a guide and a vital necessity. Data analysis results indicated digital story preparation had positive effect on the prospective pre-school teachers' self-confidence on TPCK.

INTRODUCTION

Technology, seen as one of the most important components of the information age, is one of the most important tool used in education as in every other field today. The important thing in education is not the frequent use of technological tools, but its usage with appropriate pedagogical approaches. Technology integration into education, is a complex process that incorporates many elements (Britten and Cassady 2005, see Perkmen and Tezci 2011). Pedagogical knowledge (PK), content knowledge (CK), and technological knowledge (TK) are integral elements of this process (Mishra and Kohler 2006). As a result of the research, it has been realized that technology integration without pedagogical and content knowledge is not functional. Therefore, integration of technology into the teaching-learning process regarding pedagogical and content knowledge has been the focus of recent studies (Graham et al. 2009). The TPCK model based on pedagogical content knowledge (PCK) identified by Schulman focuses on the interaction between pedagogical content knowledge and technology to create a more effective learning process through the use of technology (Mishra and Koehler 2006). According to this, technological pedagogical content knowledge (TPCK) is designed as a model consisting of seven components and putting forward the three main components of knowledge (technology, pedagogy and content) and their relationship with each other (Koehler and Mishra 2008; Mishra and Koehler 2006). These components are defined as follows: Technological knowledge (TK) is information about the various technologies, from low technologies like pencil and paper to digital technologies like Internet, digital video, smart boards and software programs. Content knowledge (CK) is the knowledge of basic subjects taught and learned (Mishra and Koehler 2006). Pedagogical knowledge (PK) includes information dealing with such topics as student learning, lesson plan preparation, assessment and classroom management. Pedagogical content knowledge (PCK) is the content knowledge concerning the teaching process itself (Shulman 1986). This information, because it hosts the content and pedagogy to develop better teaching practices in content areas, varies by content area. Technological content knowledge (TCK) is information that teachers need to understand in order to change a stu-

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dent's path of practice and understanding of concepts in a content area. Technological pedogogical knowledge (TPK) refers to the ways in which various technologies can be used in education and can change the way teachers teach. Technological pedagogical content knowledge (TPCK) is the requisite information for a teacher's teaching and technology integration in any content area. It stresses that, while teachers are teaching the content using appropriate pedagogical methods and technologies, they need to have an intuitive understanding of the complex interaction between the three basic information components (CK, PK TK) (Schmidt et al. 2009). TPCK model is represented schematically in Figure 1.

It is thought that the digital story method as a teaching and learning tool can prevent the negative perceptions held by teachers and prospective teachers about technology's usage for teaching purposes and that it will enable them to obtain information on how to integrate technology into teaching. Digital storytelling consists of a narrator's storytelling transmitted to an audience through the use of multimedia tools (Yuksel-Arslan 2013). Nguyen (2011) identified the digital story as a composition resulting from the integration of digital technologies with storytelling, used for communication by humans from past to future. When examining the literature, it is clear that digital stories as a means of learning and teaching contribute to the development of individuals' many features. For example, Jenkins and Lonsdale (2007, see Yuksel-Arslan 2013) stated that creating digital stories improved students' abilities to express themselves. Similarly, digital story usage for educational purposes contributes to the development of comprehension, writing, presentation and research skills, higher level thinking abilities, language, reflection and social skills (Yuksel et al. 2010). The steps in the process of creating digital stories, as gleaned from the existing literature, are explained in Figure 2 in detail (Yuksel-Arslan 2013):

Determining the Starting Point: In this dimension, the starting point of the story can be created by the prospective teacher on the subject or unit starting from her life or students' common lives. Depending on the creativity of the prospective teacher, the teacher can use any memory or event related to the subject as a starting point.

Writing Scenarios: Once the narrator has determined the subject, the importance of developing a scenario appropriate to the students' level of development is stressed. the scenario in a digital story consists of the verbal texts the narrator will vocalize. After the story has been fictionalized, the narrator starts to write the draft text. The narrator should support the story with pictures to strenghten the narrative; as such, it is stated to the prospective teacher that they

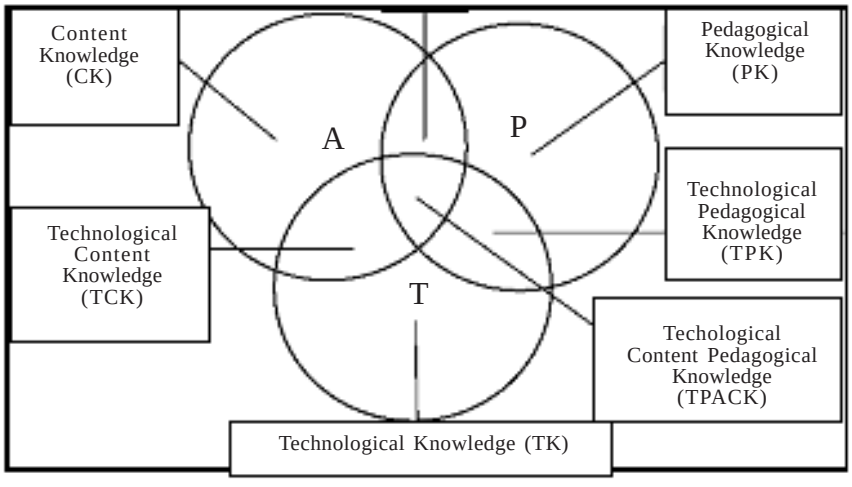

Fig. 1. TPACK Frame's schematic representation
Source: Author

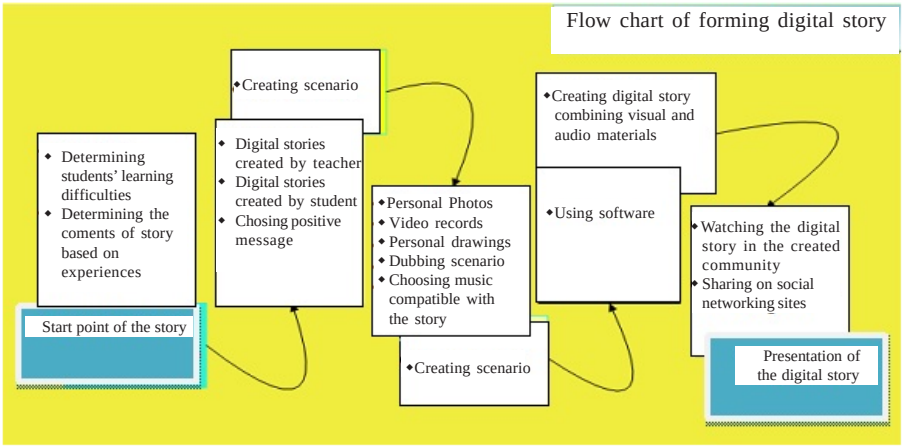

Fig. 2. The steps of forming digital story
Source: Author

should avoid too much detail while creating the scenario. The principle of economy is crucial in digital storytelling, and it is highlighted that the narrator is required to use clear and simple language in the story. Digital stories must generally fall between 3 and 5 minutes (Lambert 2003). Therefore, it is stated that limited words should be used when writing scenarios. Apart from creating a scenario, during the process of digitization of a story, the prospective teachers are warned to pay attention to the principle of economy in the story they choose.

The Choice of Visual and Audio Materials: After creating the scenario the next step is to determine the appropriate visual and audio materials. Space, events and people in the scenario are tried to be described in the digital story with visual materials. As it takes place in the digital generation scheme it is stated that personal photographs, video recordings and personal drawings can be used in visualization of the scenario. One of the important factors in the selection of the visual material is to respect the copyright of the material. For example, using material from the internet without permission is a crime. Also, choosing music appropriate to the scenario strenghtens the narration of the story.

Creation of Digital Stories by Combining Visual and Audio Materials: It is the stage of moving the story to the digital platform by using Photostory 3. It covers gathering visual and audio materials by using video editing software programs. It is aimed to gather visual and audio elements in accordance with the scenario.

Digital Story Presentation: This is the stage of educational use in which the prepared digital stories are used. The teacher can use the digital story when introducing the subject in order to attract the attention of the learner, or can use it to make students question information related to the subject. The digital story design process is parallel to the technological pedagogical content knowledge model (Yuksel-Arslan 2013). From her point of view, prospective teachers' investigating objectives and selecting one or more of them encourages content knowledge. In addition, prospective teachers' ability to use the Photostory 3 program and prepare a digital story using the program demonstrates their technological knowledge. Prospective teachers' integrating digital storytelling into instruction is regarded as an example of technology integration based on the TPCK model.

To be able to integrate technology into the teaching environment is one of the teacher competencies defined by national education ministry. However, in literature, there are many studies showing that teacher technology proficiency is limited. For example Akkoyunlu and Yilmaz-Soylu (2010) stated that teacher awareness of new technologies and motivation to use new technologies are high, but their competence to access and use new technologies is at the medium level. In addition, it is mentioned that teachers use technology to communicate via e-mail, to get information from the internet, and to prepare for classes, but they do not use it for the purpose of teaching (Seferoglu and Akbiyik 2005).

Cakir and Yildirim (2009) asserted that teachers' lack of use of technology for teaching purposes stems from their negative attitudes on the use of technology, not following technological developments, and not having information on how to integrate technology into instruction. Moreover, it was found that the prospective preschool teachers' resistance towards technology-based instruction was due to their not having encountered or designed learning environments in which technology is integrated (Yavuz-Konokman 2015). Yavuz-Konokman (2015) also adds that resistance behaviours of prospective teachers towards technology-based instuction are observed to decrease after the preparation of a digital story and its integration into instruction during practice kindergarten and preschool . That is to say, the preparation of a digital story has a significant positive effect on the prospective teachers' negative opinions of technology. In addition to teachers' or prospective teachers' negative opinions, attitudes and resistant behaviours towards technology integration in instruction, another reason why they cannot integrate technology themselves is the lack of training on technology integration in teacher training institutions. Therefore, teacher training institutions have a great responsibility to increase teacher awareness of technology and to change their negative attitudes by helping them understand how to use technology for educational purposes. In this case, prospective teacher awareness of technology, their motivation towards using technology for educational purposes and their positive attitudes towards technology integration in instruction via technology-based instructional environments should be addressed by teacher training institutions. Digital storytelling as a teaching tool is thought to develop a prospective teacher's technology integration awareness and is expected to have a positive effect on prospective teachers' technological pedagogical content knowledge self-confidence. The researchers aim, therefore, to determine the effect of digital story preparation on the prospective preschool teacher's technological pedagogical content knowledge, self confidence and their metaphorical perception of TPCK confidence. Based on this aim, questions to be answered in this study are as follows:

1. How does preparing a digital story affect the prospective preschool teachers' technological pedagogical content knowledge and their self-confidence related to this knowledge?
2. How are the metaphorical perceptions of prospective preschool teachers related to technological pedagogical content knowledge confidence?

METHODOLOGY

In this study, the mixed method was used in order to determine the effects of creating digital stories on the prospective pre-school teachers' technological pedagogical content knowledge confidence. The quantitative dimension of the research consists of quasi-experimental design to investigate the effects of creating a digital story on prospective preschool teachers' technological pedagogical content knowledge confidence. In the qualitative dimension, prospective teachers are expected to express their perceptions of technological pedagogical content knowledge by metaphor.

The Study Group

The study group consisted of 27 second year pre-school teaching students studying at Mersin University Faculty of Education during the 2012 – 2013 academic year. Students were ranked as regards their "Instructional Principles and Methods" course scores, considering arithmetical means over the 2011-2012 academic year in order to group them by means of cooperative learning approach. The list was divided into five parts, with one student selected from each part, then constituting five groups. The research was conducted in an Instructional Technologies and Material Design course for 11 weeks.

Process

The research was conducted in an "Instructional Technologies and Material Design" course at Mersin University Preschool Teaching program during the 2012-2013 spring term. "Instructional Technologies and Material Design" is divided into two hours of theoretical and two hours of applied work and provides three credits at teacher training institutions. Weekly course design is presented in Table 1.

An expert faculty member provided a training for technological pedagogical content knowledge. Within the scope of training, technological pedagogical content knowledge and its purpose

Table 1: Course design

Period	*Process*
Week 1	Applying Technological Pedagogical Content Knowledge Confidence Scale
Week 2	Explaining Technological Pedagogical Content Knowledge Theoretical Frame
Week 3	Mentioning issues to be considered and preparing material principles, examining digital story samples
Week 4 - 5	Preparing digital story (examining preschool teaching program attainments and writing scenario about the attainment) and getting student views on this process
Week 6 - 7	Choosing visual and auditory materials
Week 8- 9	Digitalizing the scenarios using Photostory 3 software
Week 10	Applying Technological Pedagogical Content Knowledge Confidence Scale, asking metaphor question to determine prospective teachers Technological Pedagogical Content Knowledge perceptions
Week 11	Sharing digital stories and evaluation by 3 experts

were described to the prospective teachers. Also, they were shown samples from Turkey and the world to demonstrate how the Technological Pedagogical Content Knowledge model is integrated into education. Ideas were produced for course materials in their field focusing on how technological pedagogical content knowledge can be used in education. Discussion and brainstorming methods were used during the research process.

Data Collection Tools

Research data has been collected using the technological pedagogical content knowledge self-confidence scale that was developed by Graham et al. (2009) and adapted into Turkish by Tasar and Timur (2009). The technological, pedagogical content knowledge self-confidence scale that was developed by Graham et al. (2009) and adapted by Tasar and Timur (2009) was designed as 5-category Likert-type scale. The scale was scored as "(1) I never trust," "(2) I trust a little," "(3) I trust middle level." "(4) I trust a lot," and "(5) I totally trust." For the 16th, 17th, 18th, 19th and 20th items, an additional item was added: "(0) I have no idea about this kind of technology." In performing confirmative factor analyses, it appears that the scale has a structure of 4 factors that consist of 31 items. The first dimension that consists of 8 items (items 1-8) was named "Technological Pedagogical Content Knowledge (TPCK);" the second dimension that consists of 7 items (items 9-15) was named "Technological Pedagogical Knowledge (TPK);" the third dimension consisting of 5 items (items 16-20) was named as "Technological Content Knowledge (TCK);" and, the fourth dimension that consists of 11 items (items 21-31) was named "Technological Knowledge (TK)." The lowest possible score from TPCK is 26, while the highest possible score is 155. From the TPCK dimension of the scale, 8 is the lowest and 40 is the highest score; for the TCK dimension, 0 is the lowest, and 25 is the highest score; for the TK dimension, 11 is the lowest, and 55 is the highest score possible. The validity of the technological pedagogical content knowledge self-confidence scale was achieved using "translation to the original" method. First of all, the Turkish form of the scale that was constituted by the researchers, translated into Turkish from English by three field experts, was translated into English from Turkish again and comparisons were made. The expressions that were thought to be conflictive were improved by researchers and a field specialist. The improved form was controlled and corrected (if necessary) in terms of Turkish grammar by two field experts. It is thought that the validity of the scale was verified through these processes. It has been found that the Cronbach Alpha reliability parameter is .92, while reliability parameters of the factors are .89, .87, .89 and .86 in row (Timur and Tasa 2011). Cronbach Alpha parameters of the original scale factors that were developed by Graham et al. (2009) have been found to be .95, .91, .97 and .92 in row. The findings demonstrate that by using the Turkish form of the scale, valid and reliable results can be obtained.

In order to determine the metaphorical perception of TPCK confidence of the prospective pre-school teachers, they were asked to complete such sentences as "*Technological pedagogical content knowledge confidence is like……., because……*"

Analyses of the Data

In the analyses of the data collected by the application of TPCK self-confidence scale to the prospective preschool teachers, SPSS 17.0 was used. Firstly, in the determination of the prospective preschool teachers' TPACK self-confidence, the collected data was subjected to a data cleaning process. After that, if the data had normal distribution, and according to the test type, the assumptions of the related test were checked. Since the data distributed normally (K-S_{24}=.082, P>.05), in determining the perception of TPCK level of the prospective preschool teachers, arithmetic mean and standard deviation were examined; and, for the dependent sample t-test was applied so as to determine whether there was a difference in terms of the TPCK self-confidence levels before and after the application.

The data, collected by using metaphors, was analyzed with a content analysis method which is one of the qualitative analysis techniques. Categories were formed according to the metaphors and their meanings. The analyses were made by two researchers. The reliability of the coding was calculated by using the formula offered by Miles and Hubermann (1994) *(Reliability=Consensus/ (Consensus+ Divergence)*. According to this formula, among the categories of the researchers the consistency is .88 (22/ (22+3)=.88). Yildirim and Simsek (2008) stated that in the cases which more than one researcher studied for data analyses, the reliability must be ensured at least 70 percent. The reliability among the encoders was found to be .88, which is very high. This is one of indicators of the study's reliability.

FINDINGS

In the study, the effects of digital story preparation on the prospective pre-school teachers' technological pedagogical content knowledge self-confidence scores obtained in TPCK scale and its dimensions were researched. Table 2 shows dependent sample t-test results in order to determine whether there is a significant difference between pre-test and post-test scores.

The evidence presented in Table 2 shows that there is a statistically significant difference between the pre-test and post-test scores of the prospective preschool teachers in the TPCK self confidence levels and sub dimensions ($p<0.05$). While a differentiation has not been observed between pre-test and post-test scores in the technological pedagogical knowledge sub-dimension ($p>0.05$), a statistically significant difference has been observed between the pre-test and post-test scores of technological content knowledge, technological knowledge and technological pedagogical content knowledge self-confidence ($p<0.05$). Among the sub-dimensions in technological pedagogical knowledge there is not a significant difference ($t_{(27)}$=1,608; $p>0.05$), so it can be said that forming a digital story is effective for developing technological knowledge, technological pedagogical content knowledge, technological content knowledge and technological pedagogical content knowledge self confidence levels of the prospective preschool teachers.

So as to determine the perception of prospective preschool teachers towards "Technological Pedagogic Content Knowledge," the answers of the prospective teachers to the question "What does Technological Pedagogical Content Knowledge mean for you?" were grouped into three

Table 2: The t-test results of the pre-test and post-test average scores related to TPACKS and the factors

	Measurement	*N*	*Mean*	*S*	*sd*	*t*	*p*
TPACK	Pre test	27	102.44	14.50	26	6.527	.000
	Post test	27	118.57	13			
TPCK	Pre test	27	28.24	3.79	26	2.347	.027
	Post test	27	30.34	5.59			
TPK	Pre test	27	24.96	4.90	26	1.608	.120
	Post test	27	26.66	4.67			
TCK	Pre test	27	10.59	4.73	26	8.673	.000
	Post test	27	18.01	3.14			
TK	Pre test	27	38.65	7.34	26	3.561	.001
	Post test	27	45.54	4.67			

titles. These titles were: having knowledge about technology, being able to use technology and form digital instruction materials. It is demonstrated in the prospective preschool teachers' perceptions on TPCK when they use TPCK in the process of preparing digital stories, especially writing scenarios and choosing audio visual elements emphasizing the uniqueness of these materials. The answers of the prospective preschool teacher to the question "What do you suggest to increase technological pedagogical content knowledge self-confidence?" are grouped below:

- Making the students participate effectively in the integration of the technology with the education.
- Making the teachers learn the role of guidance.
- Motivating the students about integrating the technology into the education process.
- Designing the education according to the learner's features.
- Teaching learners different software that can be used in their teaching activities.

The prospective pre-school teachers were asked to express their perceptions about their technological pedagogical content knowledge self-confidence level by using metaphor. In the conclusion of the content analyses, the metaphors the prospective pre-school teachers produced were divided into five categories according to their common features. According to data analysis results, 32 metaphors were produced based on 27 prospective primary school teachers' opinions. The metaphors and their sub-categories are presented in Table 3.

According to Table 3, the categories, formed by the prospective pre-school teachers were titled "Guidance," "Empathy," "Difficulty/Deficiency," "Variety" and "Vitality" In the category of "guidance," four metaphors were produced based on the opinions of the prospective preschool teachers. These metaphors were "sky, sun, star and lantern." One prospective teacher expressed his/her own metaphor as follows: *"My Technological Pedagogical field self confidence is like a lighthouse. Because light helps people to find their ways by removing fears and ambiguity in the darkness. So I see my Technological Pedagogical field self confidence like a lighthouse, I feel myself confident to find a way whenever I lack knowledge."*

Table 3: The metaphoric perceptions of prospective pre-school teachers about TPACK

Metaphor	*Frequency*	*Category*
Sky	1	Guidiance
Sun	2	
Star	1	
Lantern	2	
Compassion	1	Empathy
Excitement	1	
Anger	2	
Pleasure	1	
Incompleted study	1	Difficulty/ Deficiency
A bottomless pit	2	
Hole	1	
Sand	2	
Intermittent clouds	1	
Chameleon	1	Variety
Peacock	1	
Zebra	1	
Kingfisher	1	
Rainbow	2	
Turkish cinema	2	Vitalness
Electricity	1	
Tea	3	
Football	2	

In the "empathy" category, four metaphors were produced by five prospective preschool teachers. These are "compassion, excitement, anger and pleasure." The example for the metaphors in this category is as follows: *"My Technological Pedagogical field self-confidence is like excitement, because my technological knowledge and my self confidence to use these Technologies guide my feelings. Especially, using technology to reach content and my occupations like games, blog and social media surfing increases my excitement."*

In the "difficulty/deficiency" category, prospective teachers produced "an uncompleted study, a bottomless well, hole, grain of sand, partly cloudy sky". The common feature of the metaphors in this category was teacher inadequacy or low self-confidence towards the complexity and difficulty of the technology. This metaphor can be given as an example of the situation: *"My pedagogical field knowledge self confidence is like grain of sand, because technology is progressing and changing quickly. Correspondingly, there is so much knowledge related to the application of the technology in my field but I have so little."*

The other category was called "variety," and in this category "chameleon, peacocks, zebra, stork, beaked kingfisher and rainbow" metaphors

were produced. It has been observed that these metaphors show the prospective teachers' knowledge about technology and kinds of technology, and that the prospective teachers are competent in this area. As an example of this category the metaphor following can be used: "*My Pedagogical field knowledge is like a chameleon, because technology in education always regenerates. Since we are in the technology era, we are good users of technology willingly or unwillingly and we must be ready to use technology everywhere and in every situation, like a chameleon. We usually succeed with it."*

The last metaphor group was named "vitality," and it contains the metaphors "Turkish cinema, electricity, tea and football." In this group prospective teachers pointed out the vitality of the technology and compare TPCK self-confidence to the objects that they use and consume in their daily lives: "*My Pedagogical field knowledge is like Turkish cinema movies, because living without watching Turkish cinema is meaningless, and if my Pedagogical field self-confidence is low I cannot teach effectively, I feel deficiency*."

DISCUSSION

Based on the study results, preparing educationally purposed digital stories increases confidence on prospective preschool teachers' technological knowledge, technological content knowledge and technological pedagogical content knowledge, and technological pedagogical content knowledge-based teaching has positive effects on integrating the technology into instruction. According to Yavuz Konokman (2015), the pre-school prospective teachers' resistance towards technology-based instruction was due to their not encountering and designing the learning environments in which technology is integrated. Moreover, the resistance behaviours of prospective teachers towards technology-based instuction are observed to decrease after the preparation of a digital story and its integration into instruction at practice kindergarten and preschool . That is to say, preperation of a digital story based on the TPCK model has a positive effect on prospective teachers' technological pedagogical content knowledge self-confidence. Blonder and Rap (2015) also add that teachers' experiencing on the use of Facebook groups to facilitate learning increases their technological pedagogical content knowledge self-efficacy. Similarly, Chuang, Weng and Huang (2015) also illustrates the relationships between teachers' technology integration practice and their technological pedagogical content knowledge (TPCK). This point is also supported by Kovalik, Kuo, and Karpinski (2013) finding that prospective teachers' observations of technology-rich learning environments increased their technology knowledge. So, through recent studies it is observed that instructors should be encouraged to integrate technologies into their courses in order to train prospective teachers confident in technological pedagogical content knowledge. Moreover, it can be infered that teachers' self confidence on technology integration into instruction is supported by providing technology based instruction for the teachers.

TPCK symbolizes how teachers interactively use technology, pedagogy and content knowledge (Harris et al. 2009). The course design which was prepared based upon three main elements, "content knowledge, pedagogical knowledge and technological knowledge," and these elements' interaction with each other are seen to have a positive effect on prospective preschool teachers' technological pedagogical content knowledge confidence level. The digital story design process is also parallel to the technological pedagogical content knowledge model (Yuksel Arslan 2013). From her point of view, prospective teachers' examination of objectives of the curriculum encourages their content knowledge. In addition, prospective teachers' ability to use the Photostory 3 program and prepare a digital story via the program provides an increase in their technological knowledge. Prospective teachers' integration of digital stories into instruction regarding pedagogical principles is regarded as an example of technology integration based on the TPCK model. Therefore, the prospective teachers' experience in designing a digital story contributes to their technological pedagogical content knowledge self confidence. The recent studies also indicate a significant increase in the prospective teachers' technological pedagogical content knowledge. To illustrate this point, Sancar-Tokmak et al. (2013) have found that prospective preschool teachers have high-level self–confidence perceptions. Similarly, prospective teachers think they are adequate in their technological pedagogical content knowledge

(Haslaman et al. 2007), and it is seen that prospective primary school teachers have high TPACK perception scores. The results also show parallelism to the findings of the study, made by Sad et al. (2015) investigating that pre-service teachers perceive their technological pedagogical content knowledge favorable.

When the prospective teachers were asked to indicate their technological pedagogical content knowledge self-confidence levels, the metaphors were grouped into five categories. These were named "Guidance," "Empathy," "Difficulty/Deficiency," "Variety" and "Vitality." In this study, metaphors served as a tool of research to give meaning to prospective teachers' personal perceptions about a specific matter of fact. Based on the metaphors produced by the prospective teachers, it is emphasized that self-confidence is a vital and guiding necessity. Some of the prospective teachers stressed that their technological pedagogical content knowledge self-confidence level was low, producing such metaphors as "incompleted study, a bottomless pit and sand." Also, some of the metaphors produced by prospective teachers symbolized diversity in their technology knowledge. This finding demonstrates the prospective teachers' technological knowledge competency. For example, technology competency is described as one of the factors leading to an increase in prospective teachers' technological pedagogical content knowledge (Yavuz-Konokman et al. 2013).

The studies conducted in Turkey show that technology is not used for teaching (Sancar-Tokmak 2012). The reason for failing to use technology in teaching is linked with inefficacy in contriving to develop teachers' competency in integrating technology into instruction. Chen and Jang (2014) stated higher level of technology integration can be provided with teacher's more synthesized knowledge on how to use technology to facilitate learning. This finding also supports the role of experience on technology integration. Because the source of knowledge is experience. Similar result to this situation shows parallelism to the research demonstrating that prospective teachers' experiences on preparing digital stories lead to rise in their competency perceptions about integrating technology into instruction. Therefore, it can be inferred that teachers' technological pedagogical content knowledge shall be strengthened for providing the effective learning environments with technology.

CONCLUSION

In the dimension of pedagogical knowledge, prospective teachers designed the digital story taking into account the learners' characteristics, program's educational philosophy and learning approach. In the technological dimension, prospective teachers used the software Photostory in order to add pictures, music and voiceovers. Also, in the technological pedagogical content knowledge, prospective teachers created digital stories appropriate for program attainment and considering learners' characteristics, educational theories and approaches. Allowing the prospective teachers to use technology and create digital a story appropriate for program attainment, target group, and teaching principles in the process of creating a digital story is seen as a proof of ascent in their technological pedagogical content knowledge levels. Moreover, each step in the process of designing a digital story was titled as follows: "determining starting point," "writing scenario," "selecting visual and audial materials," "creating digital story by combining visual and audial materials" and "presenting digital story," and each was observed to be parallel to the components of the TPACK model. The components of the model are technological knowledge, content knowledge and pedagogical knowledge, technological pedagogical content knowledge. Examining the objectives of the curriculum is related to content knowledge. Creating digital stories via the PhotoStory 3 program provides an increase in technological knowledge. Integrating a digital story into instruction with regard to pedagogical principles is regarded as an example of technology integration based on the TPCK model. Therefore, the prospective teachers' experiences in designing a digital story contributes to their technological pedagogical content knowledge self confidence. Moreover, the metaphors produced by prospective preschool teachers are seen as concrete indicater of their competency in technological pedagogical content knowledge.

RECOMMENDATIONS

Based on the results of the study, technological pedagogical content knowledge-based

instructional design should be included in order to enhance prospective preschool teachers' levels of technological knowledge and technological pedagogical content knowledge. In the context of technological pedagogical content knowledge-based instructional design, it is important to the educational use of digital stories. Training activities should be designed for prospective teachers studying at a faculty of education which allows them to use technology more often. For example, blogs or multimedia lessons should be supplied based on simulations to allow the prospective teachers to more frequently encounter technology. They should be informed of the innovations in both education and educational technologies such as software, materials and online activities. In order to incorporate the prospective teachers into teaching, they should be asked to develop an imaginary technological device or software especially suitable for the purpose of digital storytelling to use in the lesson as a term project.

This study needs to be replicated with teachers of different disciplines, both within and outside Turkey. Also, the factors having positive effects on teachers' technological pedagogical content knowledge self-confidence should be made clear by using a structural equation model. Therefore, technology based learning environments for prospective teachers should be provided regarding on the factors.

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