Chapter 13
A TPACK Course for Developing Pre-Service Teachers' Technology Integration Competencies:
From Design and Application to Evaluation

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ABSTRACT

Technological Pedagogical Content Knowledge (TPACK) is one of the technology integration models that focuses on effective technology integration related to teacher competencies. This model is based on the interaction and combination of teachers' technology, pedagogy, and content knowledge. A new course was created using a TPACK model of education. In this context, the trainer takes responsibility of being a role model and the use of new technology-based applications for educational purposes appropriately updated. Additionally, integrating the TPACK model of education could make important contributions to technology integration in teacher training if the information is concretized with concept maps, if students are made creative in their own fields with digital storytelling, and if all these are transferred into a course environment via the Web with the help of a learning management system.

INTRODUCTION

Widespread use of ICTs (Information and Communication Technologies) in such processes as searching, organizing and storing information also increases its use in the field of education. This increase results in the need for individuals who can use these technologies in educational environments. Depending on this, it could be stated that this change has influenced at most the structure and functions of educational institutions. The training of individuals who can use technology depends on the training of teachers who can use

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technology. Therefore, it is necessary for teacher training institutions to improve their technological sub-structures constantly, to make the necessary effort to train teachers as appropriate to the needs of the era depending on the changing roles of teachers and to provide students with education accordingly. Thus, it could be stated that the integration of ICTs into the curricula in teacher training programs –which means effective integration of ICTs - is quite important.

ICT integration into the teaching-learning process does not merely mean bringing the equipment and software into the class environment (Earle, 2002) – in other words, equipping classrooms with ICT tools does not mean effective use of these tools in the teaching-learning process – but rather means that teachers should apply instructional strategies enriched with ICT according to the individual differences of students to strengthen students' learning (Kuşkaya-Mumcu, Haşlaman and Koçak-Usluel, 2008). Therefore, the human force, that is the teacher, should be taken into consideration in the process of integration of technology into education. There are different views and approaches regarding the integration of technologies into the education process. The Technology Integration Planning Model (Roblyer, 2006), Systematic Information and Communication Technologies Integration Model (Wang and Woo, 2007), Apple Future Classrooms Model (Dwyer, Ringstaff and Sandholtz, 1990), Social Model (Wang, 2008), Developed Pearson Model (Woodbridge, 2004) and Technological Pedagogical Content Knowledge Model– TPACK (Mishra and Koehler, 2006) are among the most important models applied in technology integration.

The overall purpose of these models is to help teachers gain the skills necessary to use ICTs effectively. However, the models differ from one another in certain respects. For example, in the Developed Pearson model, the student structures the information, while the social model features social interaction, pedagogy and technology all together. The theory in the Apple Future Classrooms model is based on teachers' strategies for adoption of technology. As for the TPACK model, it is emphasized that there are multi-dimensional relationships between technology, pedagogy and content knowledge. In this respect, pedagogy and content knowledge accompanied by effective use of technology, which are important elements of a teacher training process, increase the significance of TPACK.

TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE AS AN INTEGRATION MODEL

The Technological Pedagogical Content Knowledge – the TPACK model - is an integration model in which "technology knowledge" is added to the structure of "pedagogical content knowledge" developed by Shulman (1986). Figure 1 shows the Technological Pedagogical Content Knowledge Model and its components (Koehler and Mishra, 2005).

As can be seen in Figure 1, the TPACK model is made up of three basic components: "content knowledge", "pedagogy knowledge" and "technology knowledge". The other components of the model include the combination and intersection of the following basic components: peda-

Figure 1.The structure of the TPACK model and its components