

An Investigation on Change of Pre-Service Teachers' Self-Confidence in Technological Pedagogical Content Knowledge

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Extended Summary

Introduction: Science and Technology education has a key role in today's information and technology era in which technological innovations have been growing rapidly, scientific knowledge has been increasing incrementally and the effects of science and technology is seen prominently. Technology in the science curriculum, which was changed into science and technology in 2004 is not only related to the context but also is integrated with the teaching methods and presentation elements. Along with this change, while emphasizing the effect of technology on education, the first thing that comes to mind are the multimedia factors. Multimedia compounds different types of medias such as writing, graphic, sound, music, animation and video in electronic environment during the data and knowledge transfer. For this reason, the purpose of this study is to determine the effect of power point presentations which have been supported by multimedia factors on the pre service science teachers' self-confidence in technological pedagogical content knowledge. In accordance with this main purpose, this study was conducted in Technology and Project Design course in the Department of Science teaching of a state university during the spring term of the 2015-2016 educational period.

Method: The study was conducted with 35 pre service teachers in their senior year in the Department of Science Teaching of a state university during the spring term of the 2015-2016 educational period. Easily available sample type has been selected during the selection of the samples. The study has been designed according to the pretest-posttest modeling. Technological Pedagogical Content Knowledge Self-Confidence Scale has been used in order to identify the pre service teachers' technological pedagogical content knowledge confidence. In 6-likert scale, the items have been numbered as 1=I never trust, 2=I hardly trust 3=I reasonably trust, 4=I greatly trust, 5=I completely trust and 0=I don't know such Technologies. The scale is composed of 31 items and 4 sub dimensions. In this scale, the maximum score that can be reached is 186 and the minimum score is 26. Findings about the construct validity of the scale have been ensured through the factor analysis method. Cronbach Alpha coefficient has been measured as .92 while it has been measured as .89 for TPCK, .87 for TPK, .89 for TCK and .86 TK dimension. There is no negative item in this scale. The application comprises three stages. In the first stage, the application about the multimedia factors have been introduced to the candidates for about 4 weeks. In the second stage, the candidates have been asked to prepare a power point presentation supported with the multimedia factors in the frame of skills of the units that they have defined in the context of sciences previously. The last stage is the one during which the candidates present their presentations. Pre service teachers have studied in groups during the application process. The application have taken 8 weeks in total.

Findings, Discussion and Recommendations: In the study, quasi-experimental one-group pretest-posttest modeling has been used. SPSS programme has been used in the analysis of the data and the other descriptive analyses have been conducted by using the mode, median and arithmetic mean from the descriptive statistics. On the other hand, dependent samples t-test analysis has been used in order to determine whether the application is effective or not. According to the findings of the study, it has been confirmed that pre service science teachers' power point presentations supported with the multimedia factors has a positive effect on the change of their TPCK confidence.

To sum up, it has been determined that the use of multimedia factors that make a direct interaction between the students and the stimulant is helpful during the education process and it has provided the pre service teacher

with the positive technological, pedagogical contribution and also with the contribution in the development of content knowledge. For this reason, it is important for the teachers in the university to prepare presentations by using multimedia factors and to gain main skills through their usage. Moreover, it is possible to develop the teachers' knowledge and skills through the on-the-job seminars in order for the extension of the usage of the multimedia factors and for their application in other fields and contents.