Investigation of the Interdisciplinary STEM Activities in Virtual Learning Environments on Pre-Service Teachers' Technological Pedagogical Content Knowledge (TPACK) and Technology Acceptance Model (TAM)

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Abstract:

This research aims to evaluate the impact of interdisciplinary STEM activities in virtual learning environments (VLE) on pre-service teachers' acceptance and readiness to integrate technology within the framework of Technological Pedagogical Content Knowledge (TPACK) and Technology Acceptance Model (TAM). By conducting the study in two educational systems (Finland and Turkey), this project seeks to understand how different educational and cultural contexts influence pre-service teachers' technology integration skills. The study lies in its comparative approach that provides an understanding of how VLEs can enhance STEM education in different systems. It addresses a gap in examining how VLEs influence teachers' preparation and competences in integrating technology into their teaching practice. A mixed methods approach was used, combining quantitative data (TPACK and TAM scales) and qualitative data (semi-structured interviews). Quantitative analysis included statistical tests such as paired t-tests, ANOVA and regression, while qualitative data were subjected to thematic analysis. The participants of the study consisted of 50 Finnish pre-service teachers and 55 Turkish pre-service teachers. Findings Innovative educational tools and methods will be developed to support STEM integration in teacher education programmes.

Keywords:

Virtual Learning Environments, Interdisciplinary STEM, TPACK, TAM.