Exploring how GeoGebra software can be used as a visual mediator between preservice teachers' mathematical pedagogical content knowledge and their teaching practice.

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Introduction

Preservice teacher training courses should incorporate mathematical content and pedagogy courses for meaningful development of subject matter and pedagogical knowledge (Durdu & Dag, 2017). Such knowledge is intended to assist pre-service teachers develop skills for effective teaching in their future classrooms. The introduction of ICT has become an important tool to enhance pre-service teachers' mathematical content and pedagogy knowledge (Jita, 2018). Thus, there is a need for professional development opportunities that support teachers to effectively design technology-based lessons (Agyei & Benning, 2015) to suit our current generation. This study merges Koehler and Mashira's (2006) Technological and Pedagogical Content Knowledge (TPACK) conceptual framework with Kilpatrick et al.'s (2001) proficiency conceptual framework in the context of teaching mathematics to explore the potential of how *GeoGebra* can mediate between pre-service teachers' mathematics knowledge of subject matter and proficiency in teaching mathematics.

Methodology

This is a case study of selected 10 third-year B.Ed. (FET) mathematics students who undergone a training on how to develop and use *GeoGebra* applets suitable to teach grade 10 algebraic functions and analytical geometry. After pre-service teachers have been trained, they conducted lessons based on algebraic functions and analytical geometry using *GeoGebra* software.

Results

Most pre-service teachers showed ability to use their own created applets that are not complicated but explicit with instruction to explain concepts related to the topic they taught. Pre-service also showed evidence of visually demonstrating effects of parameters of algebraic functions using *GeoGebra* sliders. Furthermore, they used *GeoGebra* software to dynamically demonstrate geometric figures and their properties to students.

REFERENCES

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