

The Use of Science Concepts in Teaching Solid Geometry: Effects on the Conceptual Understanding and Pedagogical Knowledge (PK) of the Pre-Service Teachers

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Abstract

The use of science concepts in teaching mathematics is to improve the relevant discipline and make connection to the learners' lives by applying it to their existing knowledge. This study investigated the effects of using science concepts in teaching solid geometry on the conceptual understanding and pedagogical knowledge (PK) of the pre-service teachers and described the significant learning experiences of the students. This study utilized the descriptive method, employing both quantitative and qualitative. The quantitative method was used to determine the effects of using science concepts in teaching Solid Geometry on the students' conceptual understanding and pedagogical knowledge. A qualitative method was used to analyze the students' significant learning using observations, FGD, personal interviews, and journal entries. Thirty-four (34) pre-service students from Bicol University College of Education (BUCE) were exposed to the use of science concepts in teaching Solid Geometry. Using the t-test, there is a significant effect between the pre and post-tests on the students' conceptual understanding and pedagogical knowledge with p-values of 0.001 and <0.002 respectively. It is evident that after using the intervention, students' conceptual understanding was enhanced. Likewise, the students became more aware of the teacher's pedagogy used and the importance of pedagogical knowledge in the teaching and learning process. The use of science concepts in teaching other courses to enhance students' performance is recommended.

Keywords: Solid Geometry, Conceptual Understanding, Pedagogical Knowledge, quantitative and qualitative method, pre and post-test, Bicol University