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ABSTRACT

This study aimed to improve the van Hiele levels of geometric understanding, enhance proof-construction performance and determines the beliefs about proofs of the prospective mathematics teachers using the Traditional Method (Instructor Based) and the Enhanced-Group Moore Method. The impact of the two teaching methods was analyzed to find out which would yield better results in terms of raising van Hiele levels and enhancing beliefs about proofs and proof-construction performance.

The study used the quasi-experimental method of research and employed qualitative and quantitative analysis. The Bachelor of Secondary Education (BSEd) major in Mathematics students (20) officially enrolled in Math 233 (Plane and Solid Geometry) at a State University in the Eastern Visayas were the subject of this study. These future teachers were alternately distributed into two groups (control and experimental) based on their ranked mean grade on their prerequisite subjects (Basic Mathematics and College Algebra). The two groups were comparable in terms of their mathematical ability.

The study used three instruments, the van Hiel Geometry Test, the Proof-Construction Test and the Proof Beliefs Questionnaire.

Given some limitations of the study, the Enhanced-Group Moore Method raised a higher van Hiele level (from level 1 to 3) of the future teachers compared to the Traditional Method (from level 1 to 2). The proof-construction performance of the prospective mathematics teachers was improved from clueless to intermediate which was better compared to that of the control group (from clueless to novice). In regard to the future teachers' beliefs about proofs, they believed that a theorem has no exception, the dual role of proof is to convince and to explain and the validity of proof depends on its internal logic.

Quantitative results revealed that there was a significant difference in the van Hiele levels and proof-construction performance of the future mathematics teachers before and after the study. The future teachers exposed to the Enhanced-Group Moore Method yielded better results in terms of van Hiele levels and proof-construction performance compared to those exposed to the Traditional Method (Instructor Based). In addition, there was a significant relationship between the proof-construction performance and van Hiele levels of the future teaches in the experimental group. However, no noteworthy changes occurred in the future teachers' beliefs about proofs.

Qualitative assessments showed that the Enhanced-Group Moore Method created the "*damay effect*", helped develop self-confidence, effective communication, and exchange of idea

among future mathematics teachers. It also developed the values of sharing and helping others and both groups expressed their difficulties in proving theorems attributed to poor prerequisite skills. They prefer the two-column form of proof associated to direct proof compared to the paragraph form which they associate to proof by contradiction. The future teachers from both groups were in favor of the sequence of the presentation of the lesson and were agreeable to the incentives given.