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## **ABSTRACT**

The Philippines' future elementary and secondary teachers ranked among the bottom compared to other countries around the world in the three areas of Mathematics: Algebra, Geometry, and Number according to the Teacher Education Development Study in Mathematics (TEDS-M) of 2008. In particular, our country ranked 8<sup>th</sup> or 9<sup>th</sup> out of 10 in terms of Mathematics Content Knowledge (MCK) and Mathematics Pedagogical Content Knowledge (MPCK). These findings of TEDS-M manifest the low levels of understanding of Filipino future teachers in the basic content and content pedagogic skills in Mathematics.

This study aimed to provide an intervention to the teacher education programs in response to the dismal results in TEDS-M 2008. The intervention is called the Didactics of Mathematics Course (DMC). The study developed a DMC prototype which may be replicated to help improve the Mathematics Pedagogical Content Knowledge (MPCK) of pre-service teachers to develop MPCK. Courses in MPCK are part of pre-service teacher education programs in most countries around the world. MPCK courses such as Didactics of Mathematics, History of Mathematics, Problem Solving, Teaching Algebra, and Teaching Geometry are staples in some countries (e.g., Korea, Germany, France, Denmark, and Spain). These courses are timely for future mathematics teachers in the Philippines as the country begins implementing the new K to 12 Basic Education Curriculum. Moreover, the DMC created for this study focused on teaching Instrumentation in Mathematics within the notions of the Anthropological Theory of Didactic (ATD) as Didactics of Mathematics Course using Research and Study Course (RSC) approach and praxeologies.

The participants of the study were the 28 pre-service teachers with 75% female and 25% male in a state university in Butuan City enrolled in the Second Semester of SY 2012-2013 and in the First Semester of SY 2013-2014.

This study utilized the design study approach in developing DMC Prototype which is composed of three phases namely: 1) needs and content analysis: preliminary research; 2) prototyping phase: iterative cycles of design and formative evaluations; and 3) assessment phase: semi-summative evaluation. Thus, DMC is a product of cyclic process. It is a course that could be taken by future teachers in their preparatory programs. Moreover, using quasi-experimental methods, the study also probed the effects of DMC on pre-service teachers' MPCK. The study adopted the pre-test-post-test group design and the data was analyzed using Wilcoxon Signed Rank Test. It also used qualitative and quantitative research methods.

It was concluded that the DMC Prototype is valid, practical, implementable, and effective. Results showed that DMC enhanced the pre-service teachers' MPCK ( $z = -2.96, p = .003$ ). Integrating the Didactics of Mathematics Course (DMC) in the pre-service teacher education not only enhances their MPCK but it also provides pre-service teachers with substantial professional opportunities and thus upgrades their skills in teaching mathematics inside the classroom.