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Improving Attitude and Problem Solving Through Mathematics Camps

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IMPROVING ATTITUDE AND PROBLEM SOLVING THROUGH MATHEMATICS CAMPS

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In our work with preservice teachers and their transition to becoming professional educators we have found that they often struggle to find ways to motivate all students and engage them in deep and meaningful problem solving. One of the ways teacher educators can help preservice teachers improve their readiness in these two areas is to provide many opportunities to work with students on the enjoyment of solving problems. This poster describes the results of preservice teachers' involvement in providing mathematics camps to children that focus on enjoyment of problem solving through their teaching program at a university in Southeast Asia. The program utilizes many mathematics camps throughout the school year to connect preservice teachers with students. These camps are designed for a wide range of students on various mathematics topics ranging from all grades, K-12, and their associated content standards. First year preservice teachers are given an exploratory experience by the second and third year preservice teachers to help them understand the many aspects and the meanings of the various mathematics activities created to engage children. Preservice teachers in their second and third year of study are challenged to create a curriculum that improves students' attitude, mathematics knowledge, and problem solving. Once the camp curriculum is set the preservice teachers organize and run each of the mathematics camps.

The research described here is a preliminary study for a larger set of research projects focused on gaining a better understanding of the impact of incorporating mathematics camp teaching within a preservice program. We took preliminary observations of preservice teachers designing and enacting mathematics camps. Looking across the field notes data revealed that the preservice teachers' attitudes and creativity in solving teaching problems appeared to increase through their involvement in the mathematics camps from year one to year three. In consideration of these observations we sought to see if there was also a corresponding increase in the preservice teachers' efficacy. To get a cross sectional view of the preservice teachers' mathematics teaching efficacy the Mathematics Teaching Efficacy Beliefs Instrument (MTEBI) was used to determine the degree of teaching efficacy across the first, second, and third year preservice teachers and analysed for significant differences among the three groups. The analysis revealed that there is a significant difference between the efficacies of the first year preservice students who worked with the mathematics camps and the third year preservice students who worked with the mathematics camps. The MTEBI has two subscales of efficacy and the analysis revealed that the difference between year one preservice teachers and year three were significant on both the Mathematics Teaching Outcome Expectancy (MTOE) subscale and the Personal Mathematics Teaching Efficacy (PMTE) subscale. The results indicate that as preservice teachers are involved in designing and enacting mathematics camps their attitude, problem solving, and teaching efficacy increase. Future research efforts involving qualitative and quantitative methods will need to take place to evaluate and describe more fully the extent of the mathematics camps contribution to the observed increase in preservice teachers' attitude, confidence, and efficacy.

mathematics camps, preservice teacher efficacy, teaching motivation and problem solving