



Teachers of Mathematics: Their Views and Methods of Instruction

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Abstract Divergent researches find different relationships between teachers' practices and beliefs. One of the elements influencing the core process of teachers' learning and belief system is now their past experiences. Methodology: The purpose of this study was to ascertain the teaching methods and beliefs of secondary school math teachers. 51 teachers from seven secondary schools were grouped based on their prior teaching experiences, and they were given a series of questionnaires to complete regarding their views on mathematics and their methods of instruction. Beliefs about the nature of mathematics, beliefs about teaching mathematics, and beliefs about learning mathematics make up the dimensions of mathematics beliefs. Findings: There was no discernible difference in the beliefs about mathematics between the teachers with more and less experience. Their teaching methods and their beliefs about mathematics showed a moderately significant correlation. In conclusion, the development of sound mathematical beliefs would guide educators toward the adoption of constructive and successful teaching methods.

Keywords Teachers, Mathematics, Views, Methods of Instruction

1. Introduction

Teachers' teaching practices can benefit from the research on mathematical beliefs (Watson and DeGeest, 2005). The relationships between changes in beliefs and practices are the main focus of belief research (Warfield et al., 2005). The three dimensions of mathematics beliefs—beliefs in the nature of mathematics, beliefs in teaching mathematics, and beliefs in learning mathematics—can be linked to teachers' abilities to design engaging lesson plans (Beswick, 2007). (Evans, 2003). According to Cooney and Lin (2001), a teacher's actions in the classroom were a reflection of their beliefs. Researchers disagree about the relationship between teachers' practices and beliefs (Beswick, 2007). Beswick (2005) looked at the number of discrepancies between these two variables and found a clear conflict. But according to Kupari (2003), teachers' beliefs play a crucial role in how they carry out their teaching and learning processes in the classroom. According to Sikula et al. (1996), a teacher's beliefs are greatly influenced by their life experiences. Their instruction experience served as a useful barometer for understanding how educators supported the adjustments necessary for their students' future growth (Leder et al., 2003). According to Frykholm (1999), one of the elements influencing teachers' basic learning process and belief system is their prior experiences. According to Stipek et al. (2001), the majority of researchers who have studied the relationship between beliefs and practices have used a qualitative approach. Grouws has conducted a review of this work (2006). However, the findings of a quantitative study conducted by Peterson et al. (1989) showed a consistent link between the practices and beliefs of teachers. Swan (2006) asserted that there were differences between the teaching methods and mathematical beliefs. Ernest (1989) brought up the subject of the significance of practices and beliefs in the advancement of mathematics education. According to Beswick (2005), there is a strong but nuanced relationship between math teachers' beliefs and their methods of



instruction. In order to illustrate the connection between mathematical beliefs and instructional strategies, Raymond (1997) proposed a model that would provide details on the comprehension of the variables' consistency. Furthermore, teachers' decisions during their instructional practice were influenced by their beliefs in mathematics, even when they did not follow curriculum guidelines (Wittrock, 1986). They could get an idea of what they could do as teachers by seeing how other teachers used instructional strategies. When they were accepted into the teacher training program, this process was resumed. These pre-service teachers' beliefs would become ingrained in them throughout their teaching preparation, and the social context of the educational institutions would influence them as well. According to Stipek et al. (2001), instructors' teaching methods were influenced by their incoherent beliefs. The connection between beliefs and instructional strategies has been the subject of extensive research (Grouws).

2. Objectives

The purpose of this study is to look into secondary school teachers' attitudes about and methods for teaching mathematics. The study's specific goal was to ascertain:

- Secondary school teachers' beliefs about mathematics based on their experience teaching the subject.
- The correlation between educators' beliefs about mathematics and their methods of instruction, as determined by their teaching experience

3. Methodology

Sample: For this study, information was obtained from 51 math teachers at seven rural Selangor school districts. Of the 51 educators, 7 were men and 44 were women. The years of teaching experience of these teachers were used to group them. Table 1 displays the profiles of the respondents based on their experience as teachers. Of them, 45.1% have been teachers for more than ten years.

Instrumentation: The Teachers Teaching Practices Questionnaire (TTPQ) and the Mathematics Beliefs Questionnaire (MBQ) were the two instruments used in this study. The two instruments had to be translated back-to-back because they were modified from an earlier study. The original instruments were written in English, and two language experts were given the task of translating them. The study employed descriptive statistics to determine the nature of teaching practices employed by the teachers who were part of the research.

Table 1: Profile of Respondents according to Teaching Experience

Teaching experience	Frequency	Percentage %
1-5 years	14	27.5%
5-10 years	14	27.5%
More than 10 years	23	45 %
Total	51	100%

The 36 items in the mathematics beliefs questionnaire, which was derived from Evans (2003), are divided into three categories: beliefs about the nature of mathematics, beliefs about teaching mathematics, and beliefs about learning mathematics. A constructivist-aligned belief is indicated by a higher score. According to Hair and Anderson (2010), the Cronbach alpha value for MBQ was 0.77, which is regarded as good.

Questionnaire on Teachers' Teaching Practices: This tool was modified from Swan (2006) and Guffin (2008), and had twenty-five items. Twelve of the items are related to student-centered teaching, and a total of 13 reflect teacher-centered teaching. There was a 5-point Likert scale. TTP's Cronbach alpha value was 0.60, which was deemed appropriate.

4. Results

Teachers' beliefs about mathematics: Table 2 demonstrates that, in comparison to more experienced teachers, teachers with one to five years of teaching experience had better beliefs about mathematics learning (mean = 4.09, standard deviation = 0.46). Compared to the other group of teachers in the same dimension, the teachers with more than ten years of experience had the lowest mean value (mean = 3.37, standard deviation = 0.32) regarding their beliefs about the nature of mathematics. For the less experienced teachers, the beliefs regarding teaching mathematics had the highest mean value (mean = 3.71, standard deviation = 0.36). Based on their teaching experience, these teachers' mean mathematics beliefs were compared using a one-way Analysis of



Variance (ANOVA). Based on the teaching experience, Table 3 demonstrates that there was no significant mean difference for mathematics beliefs. The teaching methods and beliefs of math teachers: The connection between math teachers' beliefs and methods of instruction: Teachers' beliefs about mathematics and their methods of instruction were found to be significantly correlated with a moderately positive

Table 2: Average of math beliefs based on teaching experience dimension of mathematics beliefs

Teaching experience	Std		Std		Std	
	Average	Deviation	Average	Deviation	Average	Deviation
1-5 years	3.47	0.42	3.71	0.36	4.09	0.46
5-10 years	3.51	0.35	3.70	0.38	3.95	0.44
More than 10years	3.37	0.32	3.59	0.32	3.95	0.34

4. Discussion

The results of this study showed no differences in the beliefs about mathematics between teachers with more and less experience. Teachers benefit greatly from experience because it allows them to reassess their beliefs as their teaching experience grows (Stuart and Thurlow, 2000). The results of this study also demonstrated a favorable relationship between teachers' methods of instruction and their beliefs about mathematics. The outcome matched the conclusions of a study carried out by Stepek et al. (2001). According to Ellerton (1999), the teachers' experiences shaped their beliefs about Their teaching practices were influenced by their beliefs about mathematics. This supports the claim made by Wilson and Cooney (2002) that teachers' beliefs had a significant role in determining how they conducted themselves in the classroom. According to Berliner and Calfee (1996), teachers' teaching practices were significantly influenced by their beliefs about mathematic

5. Conclusion

Depending on what they do in the classroom, teachers' beliefs can have different implications for how they teach. The way teachers teach should be a reflection of their own arithmetic beliefs.Boz (2008) asserts that teachers should model student-centered teaching in their classes if they wish to advance constructivist mathematical ideas. Ball and Cohen (1990) proposed that changing teachers' beliefs through reflection on their teaching methods was thought to be a successful strategy.More emphasis should be placed on students' independent thought and reflection in teacher education (Perkila, 2003).To improve teachers' mathematical beliefs, we should therefore focus all of our efforts on improving the quality of our instruction based on prior recommendations and research findings. The development of sound mathematical beliefs would guide educators toward the adoption of productive and successful teaching strategies. Future studies are advised to take into account how teacher education programs affect the attitudes and methods of math teachers.

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