What do primary school teachers really think about mathematics?

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We present selected results from a study on Greek primary school teachers' attitudes and beliefs about mathematics. The study's sample consisted of ten teachers: five men and five women of varied teaching experience. Structured interview data were collected and analysed by using a grounded theory methodology. Contrary to previous findings, most of the teachers of our sample exhibited a positive attitude towards mathematics. This is an encouraging result since primary school teachers in Greece do not usually have a strong mathematical background from their secondary school years. Nevertheless, two participants admitted that, given the choice, they would not teach mathematics at all! This fact is alarming and should be given the appropriate attention.

Key words: Primary school teachers; Attitude; Beliefs

Introduction

Teachers' theoretical beliefs and attitudes towards a subject and its teaching influence heavily their instructional practices (Handal, 2003; Hannula, Kaasila, Laine, & Pehkonen, 2005; Richardson, 2003; Sánchez & Llinares, 2003; Thompson, 1984). For the subject of 'mathematics' in particular, several teachers believe that 'being good at mathematics' is a skill that they do not have. Thus, they demonstrate a negative attitude towards the subject (Hannula et al, 2005; Raymond, 1997; Stipek, Givvin, Salmon, & MacGyvers, 2001).

Primary school teachers' attitudes and its teaching towards mathematics in Greece have not been fully explored yet. The research presented in this paper is an attempt to fill this gap.

Theoretical background

Klaoudatos (1996) defines as beliefs about mathematics a person's point of view about them. He stresses that such beliefs are critical for the learning of mathematics as they shape, for example, the person's approach towards problem solving. Di Martino and Zan (2001) define attitudes as positive or negative feelings that are triggered in a specific context. The attitudes towards mathematics according to Hart (1989) include 'emotional reactions…behaviour…and perceptions of the subject' (p. 44)

A teacher's beliefs and attitudes towards mathematics are heavily influenced by her/his school experiences related to the subject (Hannula et al, 2005; Raymond, 1997). A negative school experience, for example, could possibly generate negative feelings for the rest of a person's life. Furthermore, people with such experiences tend to view mathematics as an ability to perform calculations (Stipek et al, 2001).

Methodology

A qualitative approach and more specifically a grounded theory methodology (Strauss & Corbin, 1998) was adopted for this study's data collection and analysis. Ten primary school teachers, five males and five females were chosen to take part in the research. The participants' ages ranged from 25 to 60 years and their teaching experience ranged from 2 to 30 years. Such characteristics made this sample fitting for providing 'rich' data.

The 'structured interview', consisting of open-ended questions, was used as the research tool for investigating the teachers' learning experiences and their attitudes towards mathematics. The 'question list' was based on the Hannula, Kaasila, Laine and Pehkonen (2005) research questionnaire.

The interviews were recorded and transcribed. An initial open coding was carried out by analysing the transcribed text line-by-line. Then, a constant comparative analysis approach yielded two main categories (groups) of teachers.

Results

The first category of teachers was labelled as 'Mathematics is a useful tool for everyday life' ('Everyday life', for short). Six teachers from this study's sample were assigned in this category (Figure 1). These teachers exhibited a positive attitude toward mathematics: they expressed feelings of joy about the subject regardless of their past school experiences.

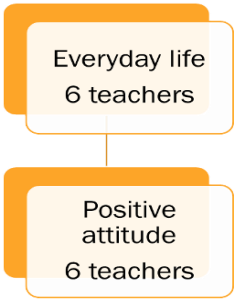

Figure 1: Mathematics is a useful tool for everyday life

Some of the first category teachers' statements are given below:

Teacher 1

> I find mathematics very useful in everyday life…actually everything is mathematics… the way we think, perceive…is mathematics.

Teacher 2

> I like mathematics! It helps me think clearly. I did not have good grades all the time, but I didn't really care… I liked the fact that everything had a solution!!

Teacher 3

> I like mathematics… but I did not always feel that way. I remember bursting into tears when trying to solve problems at school to get good marks… I did get good marks, but in my adult life I realized that I use mathematics daily and it is not just a school subject…

The second category was labelled as 'Mathematics is all about numbers and measurements' ('Numbers and measurements', for short). Four teachers were assigned in this category (Figure 2). All of them claimed that mathematics was a school subject that had to do with numbers and measurements. One of them claimed that his attitude towards mathematics was a positive one, as he felt that he was very good at it. The other three exhibited a negative attitude. They stated that they did not enjoy mathematics because they felt that they were not good at it. Two of them added that they would prefer not to teach this subject at all as they felt that a lot of effort was needed to teach it properly.

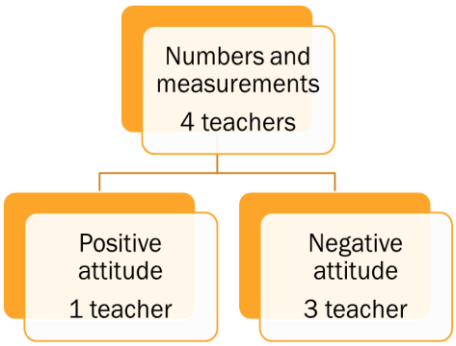

Figure 2: Mathematics as numbers and measurements

Some of the second category teachers' statements are given below:

Teacher 4

> Mathematics is all about calculations. I am very good and fast in math… I had always had good grades! So, yes, I like math and I believe that it is a skill that if you try you can have it…

Teacher 5

> Mathematics is all about numbers and measurements. I don't like math… I'm not good at math. I would prefer to teach other subjects that I am good at …

Conclusion

Primary school teachers in Greece do not usually have a strong mathematical background. Indeed, only four teachers from this study's sample stated that their school experiences related to mathematics were positive ones.

The rest of the teachers (six) stated that their mathematics experiences in the past were stressful. However, three of them exhibited a positive attitude towards the subject. In fact, they stated that it is a very useful tool for everyday life. The other three, as predicted by the literature, appeared to have a negative attitude towards mathematics and claimed that they were not good at it. Even more worryingly, two of them admitted that, given the choice, they would not teach mathematics at all!

Overall, this study, even with its small sample size, addresses two important issues. The first is that, notwithstanding the importance of mathematics as a school subject, there are teachers that would prefer not to teach this subject at all. This is an alarming fact that needs to be addressed-possibly through teacher education courses and professional development seminars. The second issue raised here is that, despite the related literature, there are teachers who had negative past experiences related to mathematics but now appear to have a positive attitude towards it. This encouraging finding could be the starting point for further research on the factors that provoke such a change of feelings.

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