TEACHERS' PEDAGOGICAL BELIEFS AND ACTUAL CLASSROOM PRACTICES IN MATHEMATICS AT UPPER PRIMARY LEVEL: A STUDY

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ABSTRACT

Mathematics occupies an important place in the school curriculum. The present study explored the mathematics teachers' beliefs about teaching and learning mathematics at the upper primary stage. The participants were ten TGTs of JNVs of Bihar. The open-ended questionnaires, rating scales, and classroom observations were conducted on five JNVs mathematics teachers. The findings show that most mathematics teachers' beliefs about teaching and learning represented the process or constructivist approaches.

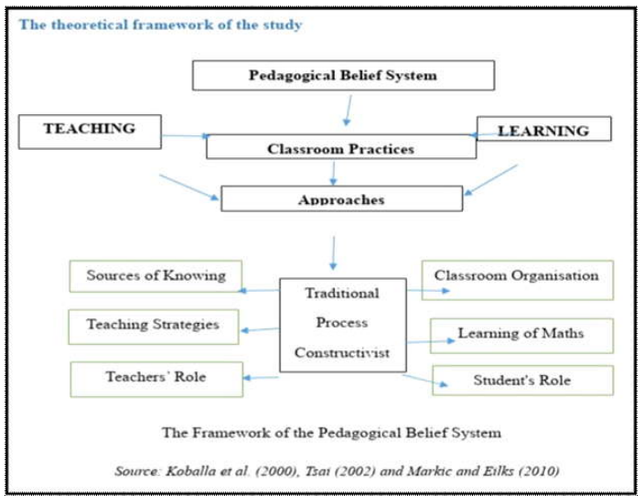
Keywords : *Mathematics teachers' beliefs, Pedagogical beliefs, Classroom practices, etc.*

Introduction

Such theoretical stances have impacted constructivism, which has redefined teaching and learning, and contemporary reforms in mathematics education. According to certain academic research, teaching may need to adapt to encourage students' learning and increase their motivation(Pajares, 1992). The author, however, came to the realization that teachers hardly ever alter their classroom practices despite efforts to improve instructions, such as curriculum creation and professional development for teachers(Adam, 2012) Teachers' attitudes toward teaching and learning mathematics, as well as other factors, may be to blame for the resistance to practice improvement(Munby, 1984). To improve their teaching practices and assist instructors in implementing reform agendas, teachers must first understand their own attitudes and practices. Teachers frequently need to give up part of their beliefs and current habits in order to develop or promote instructional practice (Little, 1993). Teachers' behaviors and views must be in line with the principles behind the curriculum or the reform effort; once they do, they "will lead the way in implementing it"(Battista, 1994). (Handal, 2003) asserts that studies on teachers' beliefs and instructional practices are crucial to take into account when implementing reform agendas because even if teachers' beliefs align with the ideas underlying the reform, the traditional nature of educational systems frequently makes it difficult for teachers to put their beliefs into practice. The majority of study on teachers' practices and views has been done in developed nations. The beliefs and practices of teachers in emerging nations must be thoroughly investigated because many of these nations are undergoing educational changes that have been influenced by constructivist learning theories(Nespor, 2006).

The theoretical framework of the study

The Framework of the Pedagogical Belief System



Source : Koballa et al. (2000), Tsai (2002), and Markic and Eilks (2010)

RAHUL KUMAR YADAV
Research Scholar, Department of Education and Education Technology, University of Hyderabad, Telangana, India
PROF. G. BHUVANESWARA LAKSHMI
Professor (Retd.), Department of Education and Education Technology, University of Hyderabad, Telangana, India

The rationale of the study

There is still a need to look at mathematics teachers' views to clarify how they affect their practice, even though a lot of research has shown that their teachers' beliefs influence teaching and learning mathematics and their real classroom practice. The study made clear that teachers' life experiences have a big impact on how their opinions are formed and how they conduct themselves in the classroom. Therefore, a thorough examination of the effects of discipline on teachers' practices and beliefs is necessary. Furthermore, no research has examined the connections between math teachers' beliefs and instructional practices.

Objectives of the study

1. To study the pedagogical beliefs of teachers.
2. To study beliefs as 'traditional,' 'process' or 'constructivist' perspectives.
3. To examine teachers' beliefs and practices in the classroom context.

Research questions

1. What are the mathematics teachers' pedagogical beliefs about mathematics teaching?
2. What are their actual classroom practices in teaching mathematics?
3. How do mathematics teachers' pedagogical beliefs influence their actual classroom practices?
4. How do mathematics teachers maximize student learning in their classrooms?

Methodology

A qualitative research framework serves as the foundation for the study. In the upper primary stage, the study investigates the pedagogical beliefs of mathematics teachers. The opinions of math teachers regarding the teaching and learning of mathematics were examined in a descriptive survey. To extract teachers' beliefs, an open-ended questionnaire was created. It has four dimensions: the nature of mathematics, the teaching and learning of mathematics, and mathematical assessment and evaluation. To further explain the participants' responses, a 5-point rating scale was used, which has two dimensions: teachers' opinions about mathematics teaching and teachers' ideas about mathematics learning. Ten classrooms were observed by using observation schedules (which include two dimensions, i.e., strategies used by the teacher in the school and the involvement of the students in classroom activities) to know the actual classroom practices of the respective teachers.

The survey was undertaken to select five JNVs of Bihar (out of 39) purposively. Ten upper primary teachers at the sampled schools teaching Mathematics of classes VI-VIII were chosen out of the expected 78 number TGTs of the region. Among them, two were female, and eight were male. Participants' teaching experiences ranged from one (1) to thirty years (30), averaging 16 years. Formal education of the participant teachers lay in between bachelor's and master's with B.Ed. and even up to M.Ed.

Data Collection

The data were collected individually from the teachers. The researcher assured that their responses would be kept secret and that they would be used only for research purposes assured the respondents. They were requested to complete the questionnaire within a limited time and then return it to the investigator.

According to teacher convenience, the Classroom was observed. The observation schedule was used to know the real reflection of beliefs through their classroom practices. It consists of four dimensions of the pedagogical process, similar to the questionnaire. The observations focused on how teacher beliefs about teaching and learning mathematics manifest in teaching practices. All ten teacher's classrooms were observed once to the real nature of their beliefs. During the classroom observations, extensive observation notes were made on TLM, students' prior knowledge, learners' engagement, homework, etc. The collection of data took nearly 15 days. The investigator created a good rapport with all respondents. The responses to the questionnaire, classroom observation, and rating scale were scored, tabulated, classified, and analyzed.

Data Analysis

First, data from the questionnaire was organized, which included themes and codes identified through several readings. Each response from the rating scale was recorded with a 5-point scale. The classroom observation was coded as yes and no. Constant comparison across these preliminary coded responses for individuals and cluster questions was used to identify significant themes and common elements in the questionnaire, classroom observation, and rating scale relating to their beliefs about

teaching elementary science. The frequencies and the percentage frequencies of teachers' answers per question were determined. Charts and graphical displays were used to represent the thematic framework of the data.

Result & Discussion

1. **What are the mathematics teachers' pedagogical beliefs about how mathematics is taught?**

   According to maths teachers, mathematics instruction should include activities that encourage pupils to explore, research, and build their knowledge. It demonstrates that their views on teaching mathematics are student-centered.

2. **What are the classroom practices in teaching mathematics?**

   Verbal explanations interwoven with classroom question-and-answer sessions were among the instructional techniques used. On occasion, pupils answer the problems after the teacher explains and shows them how to do it. According to the study's findings, all teachers regard their students' opinions, pay attention to each student, are aware of their past knowledge, and encourage their charges to discuss correct and erroneous responses.

3. **How do mathematics teachers' pedagogical beliefs influence their classroom practices?**

   It was widely acknowledged that participants are familiar with modern instructional techniques. They held the view that the focus of instruction, or what is known as learner-centered teaching and learning, is the students. Students can create goals and choose resources and activities to help them achieve them through student-centered learning.

4. **What do mathematics teachers know to facilitate students' learning in the classroom?**

   Most mathematics teachers believe mathematics is best learned through exploring and investigating mathematical ideas. The fact that the participants are aware of modern teaching practices is the study's most positive finding. They held the view that the focus of instruction, or what is known as learner-centered teaching and learning, is the students. For learning to be student-centered, students must define goals, choose resources, and engage in activities that will help them achieve those goals(Brendefur, 2016)

Educational Implications

1. Teachers of mathematics should be aware that giving pupils the chance to practice and internalize mathematical ideas is a crucial component of effective teaching and learning.
2. Teachers of mathematics should be able to guide their pupils in the development of their knowledge, abilities, and attitudes. They should also be aware that altering their teaching methods necessitates a conceptual change in their attitudes toward student learning.
3. Training programs and preparatory courses for math instructors should equip them with the knowledge and skills necessary to bridge the gap between their views and classroom practices.
4. As a result of how their beliefs affect their pedagogical choices, mathematics teachers may become more interested in professional development to expand their knowledge or more conscious of how their views affect their classroom practices, which will help their students perform better.

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