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Teachers' Perception of Teaching Mathematics at Secondary Schools in Hyderabad, Sindh

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Abstract
Teachers' perception in teaching plays a crucial role in students' academic abilities and skills. Their perception and beliefs impact on students' academic achievement in learning mathematics. The exploration of the perceptions of educators ought to be a significant effort seeing that their perception influences their classroom practices that affect the performance of students. This research study focuses on mathematics teachers' views and experiences concerning teaching mathematics at public secondary schools in Hyderabad, Sindh. In present mixed research methodology, the phenomenology research method was applied to explore teachers' perception in teaching mathematics while survey questionnaire was used for quantitative responses. The population of the study was all the mathematics teachers teaching at secondary school level in district Hyderabad. Sixty Mathematics teachers, thirty males and thirty females, were nominated using purposive sampling procedure for both quantitative and qualitative data. Data was analyzed using software SPSS. For qualitative responses, thirty (30) mathematics teachers responded in open ended questions which were 50% of total sample. Qualitative data collected through open-ended questions from respondents and analyzed by thematic analysis through six (06) steps proposed by Creswell (2009). This research study is limited to secondary school level mathematics teachers of district Hyderabad, Sindh. It was concluded that teaching mathematics needs exceptional skills to teach at secondary school level. Moreover, it is determined that need-based appointment of subject specialist, motivate learners in learning mathematics by providing a conducive environment and interactive activities, and ensure lesson planning before teaching, and share classroom challenges with school head and colleagues for better solution.

Keywords: Perception, Teachers' Perception, Mathematics Teaching, Secondary Schools

Introduction

Mathematics helps in preventing life chaos, enables problem solvers and gives the opportunity to think beyond the boundaries. It enables learners' critical minds and boosts creativity. Teachers' perception towards teaching mathematics has an immense effect on students' achievement. Porter (2019) concluded from other researchers' views that teacher perceptions about mathematics and teaching mathematics can positively or negatively have an effect on their students' knowledge and perception of mathematics. Instructors' beliefs may additionally be formed by using factors different than instructor training or professional development only (Blomeke et al., 2020). However, Baldwin (2019) added that teachers' views about mathematics did not impact the method through which they educated their learners.

It is necessary to observe teacher views and perceptions due to the fact instructors regularly deal with their beliefs and perceptions as their understanding and that teachers' beliefs and perceptions have a direct effect on their experiences and practices in the classroom (Thompson, 1992; Porter, 2019). Teachers' beliefs are developed in the course of their lifespan and are affected via using a variety of factors, inclusive of experiences, circumstances and different human beings in their lives (Knowles, 1992; Hatisaru, 2018).

Researchers believe that teachers' perceptions of subject directly influence students' performance and motivation; therefore "it is necessary to conduct further research on teacher perceptions that focus particularly on mathematics at the secondary school level" (Rosikhoh et al., 2019, p.120). The study of the perception of educators ought to be a significant effort seeing that their beliefs impact their classroom practices, therefore affecting their students' acquiring knowledge (Alkhawaldeh, 2017).

Statement of the Problem

Porter (2019) concluded from other researchers' views that teachers' perception about mathematics and instructing mathematics can positively or conversely have an effect on their students' knowledge and perception of mathematics. Instructors' beliefs may additionally be formed by using factors different from instructor training or professional development only (Blömeke et al., 2020). However, Baldwin (2019) added that teachers' views about mathematics did not impact the method through which they educate their learners. It is necessary to observe teacher views and perceptions due to the fact instructors regularly deal with their views and perceptions as their understanding and that teachers' beliefs and perception have a direct effect on their expertise and practices in the classroom (Thompson, 1992; Porter, 2019). Teachers' beliefs are developed in the course of their lifespan and are affected via using a variety

of factors, inclusive of experiences, circumstances, and different human beings in their lives (Knowles, 1992; Hatisaru, 2018). Teachers' beliefs support as well as affect conversely on students' overall performance in Mathematics. The issues such as teachers' terrible mathematics concern knowledge, instructors' lack of instructive competence, teachers' as well as students' perception regarding mathematical mastery avoid learners from growing their mathematical grasp (Amirali & Halai, 2010; Ali, 2011).

Research Objectives

- To explore the teachers' perception of teaching mathematics at public secondary schools of district Hyderabad, Sindh.
- To analyze the teachers' perception of teaching mathematics at public secondary schools of district Hyderabad, Sindh.

Research Question

What are your perceptions of teaching mathematics? Is it needs exceptional skills to teach effectively?

Research Methodology

In the fields of social sciences, research relying on the research motives of both quantitative and qualitative research strategies are adopted. Therefore, in the current mixed research study, both qualitative and quantitative research methods were used to explore and analyzed teachers' perceptions of the teaching of Mathematics at the public secondary schools of district Hyderabad, Sindh. The phenomenology research technique was useful to discover and analyzed teachers' perceptions and for quantitative responses, a survy questionnaire was adopted and applied in this research study. The research design consisted of two phases for data collection and analysis, primarily with the quantitative method then growing to the qualitative method. As this study is focusing mathematics teachers only hence the purposive sampling technique was applied for data collection. In the present research study, researchers described the results of quantitative data acquired through survey questionnaires and qualitative data via open-ended question.

Population of the Study

The large group to which investigators want to generalize the findings is the population. The population in this research study is Hyderabad district of Sindh province. This consists of four Talukas (sub-divisions) including Rural Taluka Hyderabad. According to the official website of the Directorate of school education (E, S & HS) Hyderabad, there are 66 secondary and 15 higher secondary schools that are functional. The main focus is given to those teachers teaching subject mathematics at the secondary level (class matric) in government schools.

Research Sample

The sample of the study was 53 mathematics teachers, 30 each male and female, teaching mathematics at secondary school level in district Hyderabad.

Table 1.

District Hyderabad	Sample from each Taluka
Qasimabad Taluka	16
Latifabad Taluka	15
City Taluka	11
Rural Taluka	11

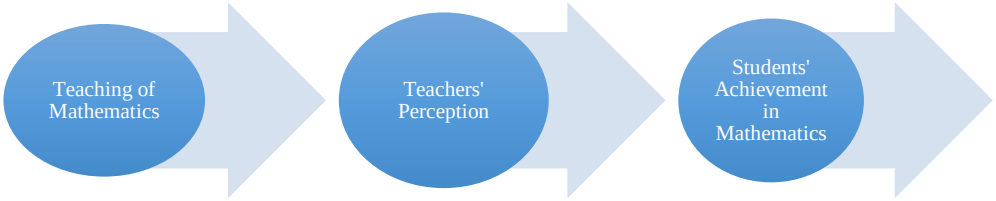
All the respondents were required to fill up the questionnaire first (Angula, 2015) then researchers purposely selected 30 participants (50% of the total participants) for the response to open-ended questions. Open-ended questions were asked to participants about mathematics teachers' perception of teaching mathematics.

Research Instruments

In creating the questionnaire, the technique of developing the survey questionnaires started out with an assessment of conceptual and theoretical literature and adapted from the reachable survey questionnaire with prior permission (Amirali & Halai, 2010) from the stakeholders of the school. For teachers' perceptions towards teaching mathematics, 8 items were developed to observe mathematics teachers' general perception and their experience with teaching mathematics. These items were designed sensibly to evaluate the general perception of mathematics teachers that probably could not analyzed through interview questions.
Interview questions were developed for the study of teachers' perception of the subject and teachers were given freedom to express and share their specific experiences and opinions here. The thematic analysis technique was used for the analysis of qualitative data obtained through open-ended questions. Therefore, the investigator settled codes, words, phrases that assisted as labels for sections of the obtained data. Hence, the themes that appeared from the current process were gradually gathered to make available a rich and deep characterization of mathematics teachers' perception, for effective teaching at the secondary school level (Angula, 2015). In qualitative data analysis, Creswell's (2009) six suggested steps were used in the present research study.

Conceptual Framework

Figure 1.



Validity and Reliability of Research Instruments
A valid instrument is such that it measures what it is supposed for measuring scores whose variances imitate the true differences of the variable being measured rather than constant or random errors (Angula, 2015). To check the validity of the designed questionnaire, it was shared with the research supervisor, language and subject experts and with support of the reviewed literature.
The reliability of a questionnaire was checked to avoid repetition or the same results in data collection. Reliability is mainly not concerned with what is being measured but with how fine it is being measured. Its reliability was measured 0.71 by piloting it among six (06) teachers teaching mathematics, three each male and female. The researcher's supervisor made changes and corrections which were included in the final instrument. The developed questionnaire was shared with experts for their reviews for the validity and reliability of tool items after that no changes were made.

Data Collection Procedures
There are some procedures to visit any government school for observation and data collection, to avoid inconvenience and disturbance. The researcher got prior permission from the director schools Hyderabad region and also had the supervisor's consent letter and student's identity card of the university. Prior permission was granted formally from the head of school to meet with mathematics teachers for data collection.
The researcher administered the questionnaire by visiting each sample among 30 males and 30 female secondary school mathematics teachers. The participants were requested to read the consent letter and mark their signatures below to allow using their responses in the research study. It was requested to fill the questionnaire on the same day to the best of their knowledge without any hesitation. It was ensured to the participants that this research study would never be used in advancement or decline in their service.

Data Analysis Procedures
The data composed through quantitative and qualitative methods were analyzed distinctly. The quantitative data collected through a survey questionnaire was analyzed on SPSS software along with graphs. However, qualitative data

was evaluated by thematic analysis – generated codes and categories then made themes from open-ended question responses.

Results

Items Analysis

The statistical implication of the questionnaire data was obtained using descriptive statistics using the software Statistical Package for Social Sciences (Jameel & Ali, 2016). Items are individually analyzed with computer software SPSS.

Table 2.
Teachers' Perception towards Teaching Mathematics

Item-1 Develop lesson plans according to set scheme of studies

Develop Lesson Plan					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	33	62.3	62.3	62.3
	A	16	30.2	30.2	92.5
	U	1	1.9	1.9	94.3
	SD	3	5.7	5.7	100.0
	Total	53	100.0	100.0	

The above Table 2 reflects that 62.3 and 30.2 percent respondents strongly agreed and agreed respectively to develop lesson plans according to the scheme of studies. This indicates that the mathematics teachers give preference to the preparation of lesson plans.

Table 3.
Item-2 Share real-life examples for conceptual clarity of the students

Share Real Life Example for Conceptual Clarity					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	26	49.1	49.1	49.1
	A	24	45.3	45.3	94.3
	U	1	1.9	1.9	96.2
	D	1	1.9	1.9	98.1
	SD	1	1.9	1.9	100.0
	Total	53	100.0	100.0	

The table above 3 reveals that 49.1 and 45.3 percent respondents strongly agreed and agreed respectively for sharing real-life example for conceptual clarity of the students. This shows that it is necessary for mathematics teachers to align mathematics subject with real-life situations for conceptual clarity and better understanding.

Table 4.
Item-3 Create a favorable environment in the class to give enough space to learners so they share their learning difficulties

Favorable Environment in the Class

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	25	47.2	47.2	47.2
	A	23	43.4	43.4	90.6
	U	3	5.7	5.7	96.2
	D	1	1.9	1.9	98.1
	SD	1	1.9	1.9	100.0
	Total	53	100.0	100.0	

The above Table 4. reflects that 47.2 and 43.4 percent respondents strongly agreed and agreed respectively to create a favorable environment in the class to give enough space to learners so they share their learning difficulties. This concludes that the mathematics teachers create a charming environment in the class and behave friendly with students to ask questions and share their difficulties easily.

Table 5.
Item-4 Use modern resources (ICT) in teaching of mathematics

Use Modern Resources (ICT)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	22	41.5	41.5	41.5
	A	21	39.6	39.6	81.1
	U	3	5.7	5.7	86.8
	D	6	11.3	11.3	98.1
	SD	1	1.9	1.9	100.0
	Total	53	100.0	100.0	

The above table 5. reflects that 41.5 and 39.6 percentage respondents strongly agreed and agreed respectively to use modern resources (ICT) in teaching of mathematics. This determines that modern resources are important for mathematics teachers.

Table 6.
Item-5 Favor activities for teaching of mathematics

Favor Activities for teaching					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	17	32.1	32.1	32.1
	A	29	54.7	54.7	86.8
	U	5	9.4	9.4	96.2
	D	2	3.8	3.8	100.0
	Total	53	100.0	100.0	

The table above 6. shows that 54.7 and 32.1 percentage respondents agreed and strongly agreed respectively to favor activities for teaching mathematics. This indicates that teachers favor activities which grab the attention of students towards mathematics.

Table 7.
Item-6 Use standard recommended tools for measuring mathematical learning outcomes

Use Standard Recommended Measuring Tools					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	17	32.1	32.1	32.1
	A	29	54.7	54.7	86.8
	U	4	7.5	7.5	94.3
	D	3	5.7	5.7	100.0
	Total	53	100.0	100.0	

This table 7. shows that respondents 54.7% agreed and 32.1% strongly agreed to use standard recommended tools for measuring mathematical learning outcomes. This conveys that mathematics teachers use such assessment tools that not only measure knowledge of the subject but also gauge concepts of learners.

Table 8.
Item-7 Are provided capacity building opportunities

Are Provided Capacity Opportunities					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	12	22.6	22.6	22.6
	A	28	52.8	52.8	75.5
	U	3	5.7	5.7	81.1
	D	8	15.1	15.1	96.2
	SD	2	3.8	3.8	100.0
	Total	53	100.0	100.0	

The above Table 8. reveals that 52.8% strongly agreed and 22.6% agreed to provide capacity building opportunities. It concludes that the majority of teachers are looking for capacity building opportunities for further enhancement of their skills in teaching.

Table 9.
Item-8 Share students' mathematical learning issues with teachers and HOD

Share Mathematical Learning Issues with HOD					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SA	18	34.0	34.0	34.0
	A	27	50.9	50.9	84.9
	U	5	9.4	9.4	94.3
	D	3	5.7	5.7	100.0
	Total	53	100.0	100.0	

The above table 9 indicates that 50.9 and 34.0 percentage respondents strongly agreed and agreed respectively to share students' mathematical learning issues with teachers and HOD. This expresses that mathematics teachers share students' problems in learning mathematics with other teachers and headmasters.

Research Question

In response to question: 1. What are your perceptions of teaching mathematics? Is it needs exceptional skills to teach effectively? Secondary school level mathematics teachers' perception of teaching mathematics was clear that it needs exceptional skill to teach it. It means any teacher having a mathematics background could not teach mathematics effectively. There were many teachers who were of the same opinion that teachers should develop lesson plans according to students' learning objectives, share real-life examples for conceptual clarity of learners and use advanced technological resources for students' attention and motivation.

In response to question which was about the effective teaching of mathematics 80% of the respondents have the same opinion that exceptional skills are required to teach mathematics effectively. The majority of mathematics teachers have confirmed that excellent skills are necessary for teaching mathematics. R5 said that *"Yes, I strongly agreed that teaching of mathematics needs exceptional skills*" also R25 responded that *"Yes, I firmly agree that teaching of mathematics needs exceptional efforts to make it efficiently*" (It declares that a subject specialist teacher is beneficial for mathematics teaching rather than other subject background teachers).

In reply to the same question which was about effective teaching of mathematics only 20% of the respondents gave the same view that mathematics teachers did not require any exceptional skills to teach mathematics effectively. R35 responded that *"No, I don't think that there is need of exceptional skill. Mathematics is a subject of understanding. A common teacher can teach better by being at the level of students*." (It suggests that any ordinary teacher can teach mathematics easily there is no need for a subject specialist teacher at the secondary level).

Discussion

It is concluded from previous research that the students' success degree in mathematics is at the bottom line as compared to other science and art schooling subjects (Akhtar & Saeed, 2018). Students' mathematical knowledge was found below the average due to factors related to the school, educator, and instructional approaches (e.g., education materials, study room management, instructor knowledge, attitudes closer to mathematics, guidance, and beliefs) (Mata et al., 2012). Society and environment that also affect students' performance in the subject of mathematics include background knowledge, family pressure, and expectations. Educators' beliefs about mathematics aptitude show the idea that learners are born with such an ability and that this ability is unchangeable rest of their lives (Blömeke et al., 2020).

Teachers' perception towards the subject mathematics varies in different studies. It is amusing and makes ready ways that could be used to get more out of the interest of the learners. Mathematics teachers' beliefs and attitudes are the chief watchdogs for professional schoolroom behavior and these greatly influence on decision-making in any mathematics classroom (Jacobs & Durandt, 2016). The perception held by persons reveals their thoughts and feelings

and can be sometimes shown in behavior (Segarra & Julia, 2022). Subject mathematics educators' views towards the subject as a utility of mathematics, the technique by which mathematics should be learned, the comfort or efforts of the subject, also male/female gender capability and their belief towards mathematics influence learners' performance (Mensah et al., 2013). The course of study and teachers' pedagogical information about subject mathematics can produce decent results (Ayub et al., 2021).

Secondary education plays a significant role in a flourishing future, both at an individual level and nationwide (Akhtar & Saeed, 2018). At this level mathematics is a compulsory and important subject. The aforesaid makes it difficult for pupils to connect mathematical learning to daily lives, which often reasons greater levels of anxiety and inferior performances than what would reflect their abilities. Every person has a unique innate and acquired belief and perception towards something. Educators should perform as a facilitator during lecture time in the classroom (Ayub et al., 2021). Amirali & Halai (2010) explained 'beliefs' as an undeniable individual 'truth' detained by everybody, drawing from experiences and imagination. However, teachers' perception into practice is prejudiced by the ironic context. I-e: school culture, pedagogical approaches, previously learnt knowledge of learners (Kupari, 1996; Lepik et al., 2012). Segarra & Julia, 2022 concluded that mathematics teacher's beliefs and attitude towards mathematics have a significant reasonable relationship with students' academic achievement. There is a strong bond between positive attitudes toward and success in mathematics has also been well recognized (Jacobs & Durandt, 2016).

Conclusion

It was concluded from the present research that teachers' perception towards teaching mathematics determined that it needs exceptional skills to teach mathematics. Teachers who have specialized degree in mathematics and pedagogical expertise, as well as command over subject mathematics, would give better results. Teachers were teaching math according to traditional teaching approaches and were not applying student-centered teaching approaches along with the less use of modern resources would cause students unmotivated that impact low achievement in the subject. There was a lack of subject specialists in public secondary schools of district Hyderabad. However, there were only a few respondent teachers who are in favor that teaching mathematics does not require exceptional skills to teach effectively. It was not necessary that only teachers belonging to a mathematics background could teach math well but any teacher could teach it efficiently. There was no need for subject specialization in mathematics to teach brightly.

The majority of mathematics teachers were in favor of providing a conducive environment in mathematics class and give sufficient space to learners to share and ask queries easily. Also teachers suggested planning lessons before entering the class as per scheme of studies for effective teaching. It was observed that student motivation in mathematics learning is low as compare to other subjets. Many of teachers have advised to use modern technology and extensive real-life examples for conceptual clarity and motivation of learners. Motivate learners with impressive teaching and sharing the importance of Mathematics in our lives. Subject teachers share their difficulties with head of department or principal for better soloution. It was concluded that teacher's perception impacts the students achievement in Mathematics. Mathematics teachers' positive attitude and supporting behavior in teaching mathematics connect with students' success and motivation towards genuine mathematics learning.

Limitations of the study

The present research study is focused on Mathematics teachers within the location of Hyderabad District of Sindh Province. Therefore, the findings of the research study are limited over secondary schools of Hyderabad district only.

Recommendations

On the basis of research results of the present research study, it has been recommended that:

- Motivate learners in learning mathematics through techniques such as creating a better environment in the class and behaving respectfully with a positive attitude with students.
- Create a friendly environment in the class and give space to learners to share their confusions and ask question freely.
- Follow scheme of studies and students learning outcomes (SLOs) in development of lesson plans for efficient delivery of lessons and timely course completion.
- Appointment of teachers should be subject-specific, need-based at secondary level rather than general academic qualification.
- Assessment tools must focus on conceptual understanding of learners
- Ensure the availability of basic resources such as proper and attractive classrooms, fresh drinking water, clean washrooms, maintained play area for sports and physical activities, etc., as well as maintained science and computer laboratories.

- In teaching mathematics, ensure the use of modern resources including computer laboratories, projectors and smartphones to motivate learners in quality teaching.
- Mathematics teachers should share their challenges with school management and colleagues for better solutions.

Future Recommendations

It is suggested to the future researchers to find out the mathematics teachers' views regarding the curriculum of mathematics that influence teachers' performance and students' achievements.

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