



The Perspective Of Students Of The Higher Diploma In Pre-Service Teacher Education At Yarmouk University On The Nature Of Mathematics, Its Learning And Teaching

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ABSTRACT

This study aimed to identify the views of student teachers at Yarmouk University towards the nature of mathematics, its learning, and teaching from the perspective of students of the Higher Diploma in teacher education. A questionnaire about the nature of mathematics and the teaching and learning of mathematics was used to determine the perspectives of student teachers among the sample participants. The study sample consisted of 20 randomly selected male and female student teachers from Yarmouk University's pre-service teacher preparation and qualification programme. The study's findings revealed a high level of perspectives among student teachers towards the nature, learning, and teaching of mathematics. The study suggested providing courses for mathematics teachers to increase their awareness of teaching and learning.

1. Introduction

The teacher is considered as an essential element in the teaching-learning process, with all of his cognitive, personal, and emotional attributes. He is also regarded as a role model in bringing about the necessary improvements in the teaching and learning processes in general. Given the significance of mathematics in the school curriculum, it is necessary to investigate the emotional and cognitive aspects of the teacher, particularly his perspectives towards the nature of mathematics, his perspectives about its teaching and learning, and the relationship between these perspectives and his teaching practices.

A mathematics teacher's perspectives are developed before he begins his teaching career, and he has many perspectives and views about the nature of mathematics, as well as its teaching and learning, which are influenced by his school and university experiences with mathematics. The mathematics teacher's attitude system develops - and may change - as he practices teaching mathematics, influenced by his personal experience and the experiences of his colleagues in the profession, and his students also play an important part in shaping and modifying his perspectives he holds about the subject.

Previous research has found that mathematics teachers' perspectives vary. Some of them believe that mathematics is simply knowledge that can be readily taught, while others say that mathematics is difficult for students to learn without help and guidance from their teachers. (Tarawneh, , 2018)

According to Pajares and Miller (1994), students' perspectives have a significant impact on their decisions, their level of effort, and their perseverance in achieving goals. They also predict what can be done by students based on their knowledge and skill set and assess how well students can deal with different stimuli and their fears.

There are various ways to define an attitude. They are mathematics teacher perspectives, thoughts, and viewpoints on a variety of topics related to mathematics education and instruction. Kember (2016) defines them as an individual's perspective and confidence in an individual ideas and topic, which he develops independently through his acceptance of knowledge about a particular topic or activity designed for a certain circumstance.

According to (Kim, Sihn, Mitchell, 2014), perspectives of maths teachers are defined as their perspectives about their own competence and capacity to carry out particular maths teaching activities at a particular standard of quality in a classroom setting.

Phillip (2007) defines it as a collection of perspectives and perceptions that people have about the world and the objects around them. It belongs to the emotional side, with attitudes, inclinations, and feelings, but it is more conscious than those components. He goes on to say that perspectives influence an individual's abilities and work to drive his decisions about what he believes in, towards the world and the things around it, and are more resistant to change than feelings, opinions, and attitudes.

Therefore, if teachers do not hold perspectives about their competence in teaching mathematics that are consistent with these development programmes, the efforts undertaken to establish curriculum in the subject matter may be in vain (Battista, 1994).

As a result, a lot of researchers, whether in mathematics or not, have noted that the use of creative and effective teaching methods depends on how much a teacher believes in his ability to teach the material. In fact, some argue that a teacher's opinions about the power of instruction serve as a direct reflection of his impact over procedures for managing the classroom. (Gordon, 2001)

Perspectives towards the nature of mathematics can be defined as a collection of conscious or partially conscious ideas and perceptions, concepts, meanings, and an ambiguous attitude about mathematics as a subject and specialisation. (Thompson, 1992)

Beswick (2012) identified a number of correlations between teachers' perspectives towards the nature of mathematics and perspectives about teaching and learning mathematics, explaining that the mathematics teacher's perspectives about the nature of mathematics influence his perspective and perspectives about teaching mathematics, the learning outcomes he wants to achieve for his students, his role in teaching mathematics, and the teaching style he prefers. The function of students in mathematics education and the kind of mathematical activities that are appropriate. The following table shows the relations between mathematics teachers' attitudes.

Table 1: The relations between mathematics teachers' perspectives (Beswick, 2012. P.130)

perspectives on the nature of maths	Perspectives towards teaching maths	Perspectives towards learning maths
The conventional understanding of mathematics as a set of tools	Focus on content, with an emphasis on performance.	Mastering skills, instructive knowledge
The ideal view	Focus on content with an emphasis on understanding.	Comprehension is a constructive activity
considering mathematics to be a means of solving problems	Focus on the student	Self-exploration depending on the student's interests.

2. Problem of the study

Jordan started focusing on teachers in general and math teachers in particular to keep up with developments in mathematics curricula that aim to develop students' understanding because the country's students performed below the global average on international tests for science and mathematics (Trends in International Mathematics and Science Study, 2019). Jordan was ranked 33 out of 39 participating countries. Additionally, to offer improved development opportunities with the goal of enhancing the teaching of mathematics. (Human Resources National Centre, 2021). In order to accomplish this, it is important to focus on the pre-service mathematics teacher by determining their perspectives and views about the nature of mathematics, as well as how well they align with his teaching methods. This aims to give contributors of the pre-service teacher training and certification diploma programme a knowledge foundation and to better comprehend those perspectives, which are a significant source for decision-making in the classroom.

3. Questions of the study

Main question which state that "What are the perspectives of student teachers in Yarmouk University's teacher preparation and qualification diploma programme on the nature of mathematics, teaching, and learning?". The following questions arise from it:

- What are the perspectives of student teachers in the teacher education diploma program at Yarmouk University towards the nature of mathematics?
- What are the perspectives of student teachers in the teacher education diploma program at Yarmouk University towards teaching mathematics?

- What are the perspectives of student teachers in the teacher education diploma program at Yarmouk University towards learning mathematics?

4. Aims of the study

The purpose of this study was to identify the perspectives of student teachers in Yarmouk University's teacher education programme about the nature of mathematics and how to learn and teach it. Knowing these perspectives is important because it helps to form a clear vision of how to address students' problems with learning and teaching.

5. Significance of the study

The study's significance stems from its focus on a fundamental part of the educational process, the mathematics teacher, as well as a major variable in the educational system, perceptions of the nature of mathematics and its learning and teaching. The study's theoretical and practical implications are also significant. The theoretical part of this study may present a set of causes that lead to the construction of some mathematical perspectives among students, as well as the development of positive mathematical perspectives based on theoretical frameworks and previous studies.

On the practical side, knowing the perspectives of student teachers about mathematics may help in selecting and implementing lessons, and in methods of presenting them to students, which reflects on students' performance and improves their achievement. Moreover, student teachers may reflect their perspectives about mathematics on their teaching methods and diversity, enhancing their engagement in the subject. On the other hand, this study may open up avenues for future research in the same field.

6. limitations of the study

- This study was limited to student teachers enrolled in the Diploma in Teacher Qualification Program at the Faculty of Educational Sciences at Yarmouk University, who were enrolled in the first semester of the academic year 2023-2024.

- This study was limited to analysing perspectives on three domains: the nature of mathematics, learning mathematics, and teaching mathematics. It does not address the areas of mathematics teachers' perspectives, which restricts the generalizability of the findings in light of the study tool's psychometric qualities of validity and reliability.

7. Literature review

Shatia and Ashour (2022) conducted a study aimed at exploring the perspectives of student teachers at the University of Jordan regarding learning and teaching mathematics. To achieve the study's objective, an open-ended question was posed to the students to uncover their perspectives. The study sample consisted of 274 male and female students from the Faculty of Educational Sciences at the University of Jordan. This study adopted a qualitative descriptive-analytical approach. Students' responses were analyzed and categorized into perspectives, with a total of 58 perspectives distributed across four general ideas. The results showed that the prevalence rates of these perspectives ranged from 3% to 92%. The most prevalent perspective among students was that "the mathematics teacher is the reason for loving the subject" (92%), followed by the perspective that "mathematics is a difficult and complex subject" (81%), and then the perspective that "mathematics is an important subject" (72%). The least prevalent perspective was "there is no appreciation for a student who solves a problem in a new way" (3%). Based on the results, the researchers recommended several actions, including providing real-life activities that connect mathematics curriculum content to actual situations, and conducting qualitative research to study the factors contributing to the formation of negative perspectives among students.

Tunc, Cakiroglu, and Bulut (2020) aimed to investigate the self-efficacy perspectives of pre-service mathematics teachers. The sample consisted of 31 teachers, and the results showed that teaching had positive contributions to pre-service mathematics teachers' self-efficacy perspectives. The results also revealed that pre-service teachers had confidence in using concrete models as learners and teachers, and they believed that using these models would have positive outcomes in the teaching and learning process.

Al-Abid's (2020) study investigated mathematics student teacher perspectives on learning and teaching mathematics, as well as their effectiveness in teaching, and their relationship to their perspectives on students' mathematics knowledge progress. Three scales were used: perspectives on learning mathematics, attitudes on the usefulness of mathematics education, and mathematics teachers' perceptions of student understanding progress. The validity and reliability have been proven for research purposes. The study sample included 168 university mathematics student teachers. The findings revealed that as student teacher favourable perspectives towards learning mathematics improved, so did their efficacy in teaching mathematics. Similarly, when student teacher positive perspectives towards learning mathematics developed, so did their assessment of their student's progress in mathematics. Finally, as student teacher ability in teaching mathematics increased, so

did their perception of students' mathematical comprehension development. The study found that perspectives and effectiveness were major determinants of difference in students' perceptions of their mathematical understanding progress.

Yildiz, Ciftci, and Ozdemir (2019) aimed to study the relationship between students' perspectives about their mathematical self-efficacy and the sources of their self-efficacy. The study sample consisted of two students, one with high achievement in mathematics and the other with low achievement. The results showed that students' perspectives about their self-efficacy were parallel to their academic achievement. The study also showed that students with high achievement had positive perspectives about mathematics, while students with low achievement held negative perspectives.

Du, Liang, and Schalow (2019) aimed to identify the impact of students' attitudes and perspectives about mathematics on their outcomes and learning arithmetic. The results showed that students believed that it was necessary to be good at mathematics; however, being good was a necessary but not sufficient condition for good performance in arithmetic. The results also showed that students with good performance in arithmetic held positive perspectives about mathematics.

At-Trawneh and Al- (2018) conducted a study with the goal of examining the perspective of mathematics teachers and the connection between those perspectives and their instructional strategies. There were 18 teachers in the sample, and the study used a descriptive methodology. A perspectives questionnaire, open-ended questions, classroom observations, and audio and video recordings of class sessions were all used to gather data. Based on both quantitative and qualitative analyses, it was found that teachers' perspectives are generally more in line with the constructivist approach to problem-solving. Teachers did, however, express conventional perspectives regarding the nature of mathematics and how it is taught and learned, to varied degrees. According to the study, there are differences in teachers' individual and collective perspectives regarding mathematics education and learning.

Ayele and Dadi (2016) conducted a study aimed at understanding students' perspectives about problem-solving and learning mathematics. The sample consisted of four schools, and the results showed that students' perspective's about problem-solving and learning mathematics were neutral and unbiased. There were statistically significant differences favouring males based on students' majors and parental residency. However, there were no statistically significant differences between the perspectives of males and females regarding their perspectives about learning mathematics and problem-solving.

The study by Watson and Ruiz-Hunt (2015) aimed to identify the impact of early field training experiences on the efficacy perspectives about teaching mathematics among pre-service teachers. This quasi-experimental study included 126 pre-service teachers, and two instruments were used for data collection: a Personal Mathematics Teaching Efficacy Scale and a Self-Efficacy Perspectives Scale. The study yielded several results, including the positive effect of the educational content taught in the "Mathematics for Teachers" course on the development of teaching-related efficacy. It also found a positive effect of mathematics content on the development of teaching-related efficacy.

Memnum and Hart (2014) conducted a study to identify differences in the perspectives of mathematics teachers in the United States and Turkey. The study indicated that teachers in both countries had perspectives consistent with the standards of the National Council of Teachers of Mathematics, with U.S. mathematics teachers showing more alignment with constructivist views compared to their Turkish counterparts.

Conner, Edenfield, Gleason, and Ersoz (2011) studied pre-service mathematics teachers through interviews, classroom observations, and surveys at successive intervals. The study observed a relative stability in teachers' perspectives about mathematics, with a shift in their perspectives about teaching and learning mathematics from teacher-cantered to learner-cantered approaches.

Al-Ser (2006) conducted a study to investigate the perspectives of mathematics students at the College of Education at Al-Aqsa University about mathematics and to determine the significance of the relationship between these perspectives and their teaching performance. To achieve the study's objectives, the researcher developed a scale consisting of 46 items, organized into three dimensions: perspectives about the nature of mathematics, perspectives about learning mathematics, and perspectives about teaching mathematics. The research sample consisted of 87 male and female students. The research results showed that 56.3% had an achievement-oriented view of mathematics, and 62.1% believed in the naturalistic and experimental view of mathematics. Additionally, 54% believed in the idealistic view of mathematics, and 68.2% believed in the dynamic and social view of mathematics. The study also revealed that 89.6% of the sample held mixed perspectives, and 93.1% believed in collaborative learning. Moreover, 83.9% had perspectives in the educational value of mathematics, and 56.3% of the students believed in their mathematical self-efficacy. All students believed in the constructivist view of teaching mathematics. Furthermore, the results showed no relationship between teaching performance and perspectives about mathematics.

8. Terms of definition

Teacher Students' Perspectives: An interconnected set of domains, ideas, and perceptions held by teacher students in a pre-service teacher preparation program towards the nature of mathematics and the processes of learning and teaching. Operationally measured through mathematics teachers' responses to a perspectives questionnaire, including three axes: perspectives about the nature of mathematics, perspectives about learning mathematics, and perspectives about teaching mathematics.

Teacher Students: These are students enrolled in the Pre-Service Teacher Preparation Diploma Program at the College of Educational Sciences at Yarmouk University during the first semester of the academic year 2023-2024.

9. Methodology of the study:

This study employed a qualitative descriptive methodology, chosen for its suitability for investigating the perspectives of teacher students about mathematics.

- The Sample of the study:

The study sample consisted of teacher students in the Pre-Service Teacher Preparation Program at Yarmouk University's College of Educational Sciences, totalling 20 male and female students. They were selected randomly from a population of 120, as indicated in Table (1), showing the distribution of study sample members according to personal variables.

Table 2: Distribution of study sample members according to personal variables

Variable	Level	Number	Percentage
Sex	male	9	45.0
	female	11	55.0
	Total	20	100.0
Do you have a higher education diploma?	Yes	2	10.0
	No	18	90.0
	Total	20	100.0
Qualification	Master	-	-
	Bachelor	19	95.0
	Intermediate Diploma	1	5.0
	Total	20	100.0
Number of years of experience	Less than a year	13	65.0
	From one year to less than five years	3	15.0
	Five years and over	4	20.0
	Total	20	100.0
In-Service Training Courses	Yes	18	90.0
	No	2	10.0
	Total	20	100.0

- Reliability

The instrument was given to a sample of 10 teachers, and the two researchers asked them to respond to the study tool's items before giving it again two weeks later. Pearson correlation coefficients were calculated, and the instrument's reliability for the sample in both applications was assessed. Reliability coefficients were extracted using the Cronbach Alpha as shown in Table (3)

Table 3: Reliability coefficient using test-retest and Cronbach's alpha for the dimensions of the study tool

Dimension	Test-retest	Cronbach alpha
The nature of mathematics	**0.85	0.94
Mathematics teaching	**0.79	0.95
Mathematics learning	**0.86	0.96
Total	**0.82	0.97

Statistically significant at the significance level ($\alpha \leq 0.01$).

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able (3) shows the following:

1. The reliability coefficients (Pearson's correlation) for the sub-dimensions ranged from (0.79-0.85), with the reliability coefficient (0.82). These values were deemed suitable for the purposes of this study.

2. The reliability coefficients (Cronbach's alpha) for the sub-dimensions ranged from (0.94-0.95), with the Cronbach's alpha coefficient (0.97). These are high and statistically acceptable values, as studies have indicated that reliability coefficients above (0.70) are considered acceptable.

- Correction tool of the study:

The perspectives of mathematics teachers within the study's sample were measured through a set of statements addressing various perceptions toward mathematics, its teaching, and learning. These perceptions typically vary among mathematics teachers. Participants were asked to evaluate each statement's associated perceptions and select the preferred option from their perspective. If difficulty arose in choosing between perceptions, the one deemed more preferable was identified. The researchers assigned a score of (0) to the not preferred perception, (1) to the less preferred, and (2) to the most preferred. The scale was divided into three response levels, determined by the equation:

Range = (Maximum score - Minimum score) ÷ Number of levels

$$(2 - 0) \div 3$$

$$2 \div 3 = 0.66$$

Based on this, the response on the scale was divided into three levels:

- (0– Less than 0.66) indicates a low level of endorsement.
- (0.66 – Less than 1.32) indicates a moderate level of endorsement.
- (1.33– 2.00) indicates a high level of endorsement.

10- Results o study

Results related to the study question which states that: What are the perspectives of mathematics teachers towards the nature of mathematics, its teaching, and learning?

This question was answered by extracting the an average and standard deviations of the study sample's responses to the study's tool items as follows:

- Results related to the perceptions of mathematics teachers toward the nature of mathematics

Table 4: Averages and standard deviations of mathematics teachers' perceptions of the nature of mathematics.

Nu.		Items	Average	Standard deviations	Level
1	A	Mathematics is a set of concepts, laws, definitions, and algorithms	1.50	0.69	High
	B	Math is a set of non-routine situations that require diverse solution strategies	1.00	0.92	medium
2	A	Mathematics is an abstract science characterized by stability that is difficult to understand and analyze	0.45	0.69	low
	B	Mathematics is a renewed knowledge based on discovery and investigation	1.85	0.49	High
3	A	Mathematics is just learning products and skills that must be mastered.	0.95	0.83	medium
	B	Mathematics is just mental processes that must be developed and built by the individual	1.60	0.68	High
4	A	Most students cannot practice mathematics because practicing it requires mathematical talent.	0.50	0.83	low
	B	Most students can practice mathematics by providing opportunities to humiliate efforts, demonstrate creative abilities, build concepts, and innovate solution methods.	1.65	0.75	High
5	A	Mathematics is a science that explains natural phenomena through numbers, patterns and arithmetic procedures	1.60	0.75	High
	B	Mathematics is a tool for solving life problems	1.00	0.73	medium
6	A	Mathematics is an art like music and drawing needs talent to be an individual athlete	0.50	0.76	low
	B	Mathematics is a science and a way of thinking that has its own methodology.	1.85	0.37	High
7	A	Mathematics is based on logical trials and is therefore difficult to represent and model	0.95	1.00	medium

	B	Mathematics is a communicative language that facilitates the representation and modeling of ideas	1.20	0.95	medium
8	A	Mathematics is a hierarchical science as well as a network of interconnected ideas	2.00	0.00	High
	B	Mathematics is a separate subject that can be taught comfortably from each other	0.10	0.31	low

From Table (4), shows that that there are (7) perceptions that received high level according to the perspective of the study sample. The statement "Mathematics is an accumulative (hierarchical) science, as well as a network of interconnected ideas" obtained the highest average (2.00) with a standard deviation of (0.00), indicating that all members of the study sample hold this perception. In second place, the statement "Mathematics is a renewing knowledge based on discovery and inquiry" and the statement "Mathematics is a science and a method of thinking with its own methodology" both had average of (1.85). In third place, the statement "Most students can practice mathematics by providing opportunities for them to exert efforts, demonstrate creative abilities, build concepts, and innovate problem-solving methods" had an average of (1.65). In fourth place, the statement "Mathematics is merely mental operations that individuals must develop and construct" and the statement "Mathematics is a science that explains natural phenomena through numbers, patterns, and arithmetic operations" both had an average of (1.60). In fifth place, the statement "Mathematics is a collection of concepts, laws, definitions, and algorithms" had an average of (1.50). This result may be attributed to the engagement of mathematics teachers in training courses upon their appointment in the Ministry of Education, where they are qualified in various pedagogical aspects, exposed to training on modern teaching strategies and classroom management, and taught how to engage students in educational situations. This means that mathematics teachers to believe in the importance of utilizing students' experiences in teaching and shifting towards student-cantered teaching. This finding is consistent with the study by Al-Abid (2020), the study by Trawneh and Khasawneh (2018), and the study by Al-Ser (2006).

- Results related to teachers' perceptions towards teaching mathematics

Table 5: Averages and standard deviations of mathematics teachers' perceptions towards teaching mathematics.

	Item	Average	Standard deviations	Level
The role of the math teacher during class is to:	Transfer sports information and present it to students in an organized manner	0.90	0.85	medium
	Facilitate students' education and guide them in order to build mathematical knowledge on their own.	1.50	0.83	High
It is preferable when asking students an unfamiliar problem during math class	Suggest several strategies to solve them by the teacher, because most students are unable to solve this type of problem.	0.90	0.91	medium
	Provide an opportunity for students to reflect on the issue in order to devise strategies to solve these types of problems.	1.35	0.93	High
When a math teacher proposes a new concept, he should initiate	Focus on organizing and arranging information and introducing the definition of the concept, regardless of the students' previous ideas and concepts	0.60	0.88	low
	Discuss the ideas and concepts that students hold and that facilitate conceptual comprehension	1.65	0.67	High
The most important math education is	Give correct and organized scientific information, and follow the topics of the textbook.	1.25	0.91	medium

	Motivate students to discover and investigate non-routine mathematical problem solutions	1.15	0.88	medium
When presenting a new sports topic,	Emphasizing information, training students and focusing on new knowledge because students have no previous knowledge about it	0.50	0.76	low
	Help students connect new knowledge with previously developed knowledge	1.85	0.37	High
It is better for a math teacher	Focus on presenting and illustrating new mathematical ideas to students	0.40	0.68	low
	Knowing the thinking of his students, discussing the mathematical ideas they have, and trying to change the misconceptions of the students	1.85	0.49	High
The best method for teaching mathematics	Teach each mathematical subject separately so that there is no confusion between one subject and another.	0.10	0.45	low
	Helping students to link concepts, facts and laws in different mathematical topics	1.95	0.22	High
Necessary practices to reach the level of conceptual comprehension	Listen to students' opinions about their interpretations and justifications for their mistakes and work to link concepts, facts, laws, theories and procedures	1.60	0.75	High
	Training students to solve exercises and problems in the textbook	0.75	0.85	medium
The best way to teach students	Focuses on giving new tasks that require students to link concepts together to facilitate deep conceptual comprehension of the material	1.15	0.93	medium
	Giving worksheets to train them on the use of procedures and laws	1.20	0.89	medium
The main task of a math teacher	Covering textbook topics regardless of students' understanding of the mathematical concepts and information contained therein	0.35	0.75	low
	Help students understand concepts, laws and facts even at the expense of textbook coverage	1.75	0.64	High

From Table (5), it is evident that there are (8) perceptions that received high ratings according to the opinions of the study sample. The statement "The best method for teaching mathematics is to help students connect between concepts, facts, and laws in different mathematical topics" obtained the highest an average (1.95). In second place, the statement "When presenting a new mathematical topic, it is necessary to help students connect the new knowledge with previously developed knowledge" and the statement "It is preferable for a mathematics teacher to understand students' thinking, discuss their mathematical ideas, and attempt to change students' misconceptions" both had an average of (1.85). In third place, the statement "The main task of a mathematics teacher is to help students understand concepts, laws, and facts even if it means deviating from the textbook coverage" had a an average of (1.75). In fourth place, the statement "When a mathematics teacher introduces a new concept, they should initiate a discussion about students' prior ideas and concepts that facilitate conceptual understanding" had a an average of (1.65). In fifth place, the statement "One of the necessary practices to achieve conceptual understanding is to listen to students' opinions about their explanations and justifications for their mistakes and to work on connecting concepts, facts, laws, theories, and procedures" had a an average of (1.60). In sixth place, the statement "The role of the mathematics teacher during the class session is to facilitate students' learning and guide them to build mathematical knowledge by

themselves" had a an average of (1.50). In seventh place, the statement "When presenting an unfamiliar problem to students during a mathematics class, it is preferable to provide opportunities for students to think about the problem in order to innovate solution strategies for this type of problems" had a an average of (1.35). The reason for this may be attributed to mathematics teachers attending training courses and acquiring various behavioural qualifications upon their appointment by the Ministry of Education, where they are trained in the latest teaching methods, classroom management, and student engagement in educational situations. The perspectives of mathematics teachers about the importance of incorporating students' experience in teaching and the shift towards student-cantered teaching are consistent with the findings of Al-Abid (2020), Trawneh and Khasawneh (2018), and Al-Ser (2006).

Results related to teachers' perceptions towards learning mathematics

Table 6: Averages and standard deviations of mathematics teachers' perceptions towards learning mathematics.

	Item	Average	Standard deviations	Level
As a math teacher I thought learning is:	The student acquires new concepts, linking them to previous knowledge in order to develop his understanding of what is around him through discussion and dialogue.	1.85	0.49	High
	The student acquires new knowledge or behavior through material or moral reinforcement.	0.35	0.67	low
Mathematics education can be perceived as a human activity:	It is based on the student listening to what the teacher says and does in the classroom.	1.00	0.97	medium
	Self-reliance on the student's exploration of ideas and solving non-routine life problems with the guidance and assistance of the teacher in building common meanings.	1.20	0.95	medium
If a student makes a conceptual mistake during a math class:	Tribal mathematical misconceptions and concepts should be neglected and ignored, and correct mathematical ideas should only be taught in a good way.	0.20	0.62	low
	Mathematical misconceptions and misconceptions should be discussed with students in order to replace them with correct mathematical ideas and concepts.	1.85	0.49	High
For effective math learning to occur, it is necessary to:	Provide opportunities for students to exert their maximum potential in solving mathematical problems and building their own meanings.	0.85	0.49	medium
	Listen and pay attention to what the teacher explains and presents in the classroom.	0.40	0.68	low
Students are taught while practicing an educational activity in mathematics, through:	Collaborative work, peer learning leads to increased understanding and reaching a common meaning of what they are studying.	1.75	0.44	High
	Individual learning is better than learning with peers because it increases and develops understanding.	0.20	0.52	low
Practices are essential in teaching mathematics:	Dialogue, discussion and inquiry because they are necessary for good learning, even if it is at the expense of the curriculum.	1.35	0.88	High
	Covering the curriculum is the main task of the math teacher, even if it is at the expense of good learning in students.	0.55	0.83	low
Effective math learning occurs through:	Focus on understanding concepts and deducing laws so that they are well absorbed by the student.	1.65	0.75	High
	Training students on the use of laws and procedures to apply them quickly and perfectly.	0.75	0.85	medium
One of the principles of learning mathematics is that:	Only smart students can solve math problems quickly, and in minimal time.	0.25	0.64	low
	All students can solve mathematical problems if they have the opportunity to exert their fullest potential.	1.85	0.49	High

For good learning in mathematics to occur, a math teacher must:	Be in control of the course of the class in its transmission and presentation of sports information.	0.65	0.93	low
	It provides students with opportunities to express their opinions and find creative solutions to the mathematical problems at hand.	1.50	0.83	High
The student's role during the mathematics class is b/	Listen carefully to the math teacher in order to summarize and memorize the laws and procedures.	0.75	0.91	medium
	Practice teaching and learning activities in order to build conceptual and procedural knowledge.	1.40	0.94	High
The most important in learning mathematics:	The quantity and quality of mathematical information regardless of students' understanding of it, because understanding comes with time.	0.40	0.82	low
	The quantity and quality of mathematical ideas that students can understand, assimilate and practice.	1.75	0.55	High

Table (6), shows that there are (9) perceptions that received high ratings according to the opinions of the study sample. The statement "As a mathematics teacher, I believe that learning is acquiring new concepts by students and linking them to previous knowledge in order to develop their understanding through discussion and dialogue" obtained the highest an average (1.85). In second place, the statement "If a student makes a conceptual mistake during a mathematics class, it is necessary to discuss incorrect mathematical ideas with students in order to replace them with correct mathematical ideas" and the statement "One of the principles of learning mathematics is that all students can solve mathematical problems if given the opportunity to exert their maximum effort" both had an average of (1.85). In third place, the statement "Effective mathematics learning occurs through focusing on understanding concepts and deducing laws so that they are well understood by the student" had an average of (1.65). In fourth place, the statement "For good learning in mathematics, the mathematics teacher must allow students the opportunity to express their opinions and find creative solutions to mathematical problems" had an average of (1.50). In fifth place, the statement "The role of the student during a mathematics class is to engage in educational activities in order to build conceptual and procedural knowledge" had an average of (1.40). In sixth place, the statement "Necessary practices in teaching mathematics: dialogue, discussion, and inquiry because they are essential for good learning even at the expense of the curriculum" had an average of (1.35). This result can be interpreted as mathematics teachers creating a safe environment for students to exchange opinions, where teachers encourage students to share their opinions and ideas with their peers for discussion. Additionally, teachers motivate students to provide personal explanations for new concepts or researched phenomena in the context of the classroom, then exchange their findings with other discussion groups, and finally participate in a class discussion to engage in interactive discussions about the results obtained. This result is consistent with the findings of Al-Abid (2020), Trawneh and Khassauna (2018), and Al-Ser (2006).

Recommendations:

Based on the provided results, the researchers recommend the following:

1. Conduct similar studies to understand mathematics teachers' perceptions of professional identity and its relationship with their professional practices.
2. Develop specific measures to identify the perspectives of mathematics teachers and their perceptions of the nature of mathematics and its teaching.
3. Conduct comparative studies among student teachers at Yarmouk University to examine their perspectives about the nature of mathematics, learning, and teaching, considering personal variables such as gender, experience, and academic qualification.
4. Organize training courses for mathematics teachers aimed at directly enhancing their awareness in the field of learning and teaching.
5. Conduct studies aimed at understanding mathematics teachers' perspectives about mathematical problem-solving.

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