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RESEARCH ARTICLE

Difficulties in Solving Verbal Mathematical Problems Among High School Students in Al-Qunfudhah Governorate from the Perspective of Mathematics Teachers

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ABSTRACT

The current study aimed to identify the difficulties in solving verbal mathematical problems among high school students in Al-Qunfudhah Governorate from the perspective of mathematics teachers, and to achieve the study's objectives, the researcher prepared a tool consisting of nine axes, which are (general strategy in solving mathematical problems, strategy for creating a table, logical justification strategy, strategy for solving a simpler problem, pattern search strategy, model creation strategy, guessing and checking strategy, reverse solving strategy, and drawing a picture strategy). The first axis was divided into four dimensions: (understanding the problem, planning to solve the problem, executing the solution plan, and verifying the validity of the solution). The questionnaire consisted of (62) items, and the study sample included (80) male and female teachers from the high school level in Al-Qunfudhah Governorate during the first semester (2025 AD/1446 AH). They were selected using simple random sampling. The study reached the following results: the mean scores for all items of the axes with their four dimensions were at a moderate level, and there were statistically significant differences for the gender variable in favor of males, for the academic qualification variable in favor of those with master's and doctoral degrees, for the years of experience variable in favor of those with more than 10 years of experience, and for the training courses variable in favor of those who attended training courses. The study recommended encouraging male and female teachers to employ strategies for solving verbal mathematical problems in teaching.

1. INTRODUCTION

The mathematics curriculum aims to achieve a number of general objectives in its teaching, allowing students the opportunity to practice sound thinking methods, develop positive attitudes and inclinations towards it, and acquire fundamental and subsidiary skills in solving verbal mathematical problems represented by understanding the relationship between the data of the problem and revealing it, through identifying the meanings of the words and symbols contained in the problem statements and knowing the relationships among them, and identifying the missing information that enables students to arrive at a solution in a scientific and logical manner, being able to reach the solution in more than one way, and keeping up with the times, interpreting the developments of the era from both scientific and technological perspectives, as it is considered the language of the age and a scientific method, working to use principles that explain the reality of mathematics, integrating its branches and fields with one another, and encouraging and motivating logical thinking based on conclusions and proofs, clarifying the concept of mathematical proof, and encouraging learners to address problems, assisting mathematics in controlling and programming computers and their programs (binary number system), and encouraging learners to use computer programs to study and learn mathematics such as (chaos theory, fractal geometry...). Improving the ways students acquire basic and general concepts that, in turn, help reduce the effort exerted and the time required for the

growth of concepts and ideas. (Abu As'ad, 2023). Thus, solving mathematical problems is considered a primary goal in teaching mathematics; it requires that the student be able to build new mathematical knowledge through solving problems and applying it in other contexts, innovating a set of strategies to solve them, and reflecting while solving them (Sultan and Al-Shahri, 2019). Acquiring the skill of solving mathematical problems is of great importance for the learner, as it fosters curiosity, develops various thinking styles such as critical and analytical thinking, and enhances different skills, it serves as a means to learn concepts, skills, and principles, practice arithmetic operations, and imbue them with a special meaning for the learner that motivates them to learn and helps them make decisions, it also represents a tool to connect this knowledge with reality and new situations (Al-Ghamdi and Qaddouri, 2019).

Polya proposed a set of steps for solving mathematical problems, which include understanding the mathematical problem, devising a plan to solve the problem, executing the solution, and verifying its correctness. Strategies for solving mathematical problems vary and include: linguistic strategies, formal strategies, trial and error strategy, organized list or table strategy, pattern-seeking strategy, simpler problem-solving strategy, modeling or shaping strategy, reverse step strategy, logical justification strategy, guessing and checking strategy, pattern-finding strategy, reverse solving strategy, drawing strategy, simpler problem-solving strategy, creating tables or organized lists strategy, problem representation strategy, and logical justification strategy (Farajallah, 2014; Madkhali and Al-Malaki, 2019). Studies in the literature identify types of knowledge as linguistic/real knowledge, planning knowledge, algorithmic knowledge, and strategic knowledge, emphasizing that individuals must possess these types of knowledge to solve problems (Soylu, 2010). Cognitive skills, metacognitive skills, and self-regulation are essential for solving mathematical problems, and the cognitive processes and strategies necessary for successfully solving mathematical problems include: understanding strategy, assumption or goal setting, devising a plan to solve the problem, estimating or predicting results or performing calculations, and verifying to ensure that the plan is appropriate and that the answer is correct (Babakhani, 2011). Solving mathematical problems involves several steps, and some students find it very challenging to solve a complex mathematical problem, despite knowing the steps to solve it (Kurniati et al., 2018). Therefore, the role of teachers is crucial in helping students acquire a deep understanding of mathematics, and appropriate teaching strategies can assist students in solving mathematical problems effectively. It is important to implement various teaching strategies in mathematics, especially in problem-solving, as students have different learning abilities (Son, Darhim, & Fatimah, 2020). In previous studies such as (Siniguian, 2017) and (Tambychik, Meerah, 2010), researchers have focused more on the difficulties students face in learning mathematics without paying attention to teaching strategies for solving these mathematical problems. Verbal problems in mathematics are defined as problems that depict real-life situations; they are mathematical problems presented in the form of a "real world" or social/cultural context (real or imagined). They are defined by (Kasule, Mapolelo, 2013) as mathematical problems whose content is embodied in the form of a story based on words, and as real-life problems that require mathematical knowledge to solve, and are usually not presented as simple equations ready to be solved, but as complex textual representations that must be interpreted symbolically, manipulated, and solved. They are an important part of the mathematics curriculum due to their ability to enhance realistic mathematical modeling and problem-solving (Van den Heuvel-Panhuizen et al., 2014). Verbal problems are an important part of mathematics curricula, and time should be allocated for them in mathematics classes (Ergen, 2020). They enable learners to establish connections between mathematical knowledge in the classroom and knowledge from everyday life (Sepeng, 2013). Verbal problems are among the most difficult issues to solve in mathematics education; this is because they not only require the use of numbers to be executed, but they also require the skill of identifying, understanding, and interpreting the given problems. The complexity of these problems is often exacerbated by the need to use text to uncover missing information (i.e., the unknown), which most learners fail to do because they lack language proficiency (Essien, 2013). Abd Al-Qadir (2017) defines a verbal mathematical problem as "a new situation for which the learner does not have a ready solution, requiring them to think of a solution plan that they can execute based on their previous experiences" (p. 222). Al-Kubaisi and Abdullah (2015) define it as "a problem that presents an issue needing to be addressed or an implicit or explicit request or question, and it does not necessarily have to pose a problem for the respondent" (p. 49). Abd Al-Qadir (2017) lists the requirements for

solving verbal mathematical problems, as identified by Moleko, M., Mosimege, M. (2020), within two main frameworks:

First: Knowledge, which includes:

Facts and concepts such as knowing the rules of addition, subtraction, multiplication, and division.

Strategic and procedural knowledge, such as knowing general strategies for solving problems and understanding the steps involved in problem-solving.

Beliefs, which refer to learners' beliefs in their ability to solve verbal mathematical problems.

Second: Cognitive processes, which include:

Representing the problem: this means representing the problem in a graphical or symbolic form, such as drawing a table containing the basic data of the problem in a simplified manner.

Planning, monitoring, and evaluating, which means planning to solve the problem, monitoring the learner's steps in the solution process, and evaluating the accuracy of the solution.

Post-processing means reviewing the solution and attempting to solve it in other ways if possible. There are a set of structural factors in solving verbal problems that affect students' ability to solve them, such as the language of the problem and the words used (simple and familiar, difficult and unfamiliar), the terms included (understandable, strange), the number of steps in the solution (one step, two steps, more), and the content of the problem, such as containing facts (necessary only, excessive, insufficient for the solution), the absence of numbers in the problem or the use of numbers, the type of problem (concrete or abstract), and the magnitude of the numbers used in the problem or their small size (Al-Shahrani & Qashoush, 2019).

Reasons of difficulties in solving verbal mathematical problems:

Solving verbal problems plays a vital role in other fields, and for this reason, the method of solving them should be well taught to learners to establish a solid foundation for that. Although it plays an important role in enabling learners to communicate and apply their mathematical knowledge to real-life problems, it has proven to be difficult for most learners (Morton, Qu, 2013). Some learners are unable to interpret verbal problems, especially when they cannot visualize the concepts (Moleko, 2019), while some other learners face difficulty in understanding the questions, which prevents them from converting verbal problems into mathematical equations (Sepeng & Sigola, 2013). Learners rely on keywords to solve verbal problems, which often leads to incorrect translations of the overall meaning of the problem, while solving verbal problems requires learners' ability to read, process, and resolve mathematical situations (Salemeh & Etchels, 2016). Salihu et al. (2018) indicated that reading difficulties exacerbate math difficulties rather than cause them, and verbal problems require a person to have a deeper understanding of how to apply basic mathematical terms; as this enables the student to understand what the problem is. In their study, Vula and Kurshumlia (2015) revealed that many learners find it difficult to understand and solve verbal problems because they have limited knowledge of mathematical vocabulary. A study by Babakhani (2011) indicates that students who struggle with problem-solving are poor in effectively implementing cognitive and metacognitive strategies, as well as self-regulation strategies. Therefore, these students need clear instructions in selecting appropriate strategies for the task and applying the strategies within the context of the task. Al-Shahat and Al-Balah (2018) summarize the reasons for difficulties in solving verbal problems as difficulties in understanding and comprehending the problem, difficulties in retrieving the text of the problem, difficulties in performing the necessary calculations, converting the problem from a verbal form to a mathematical form, difficulties in processing information, and difficulties in using effective computational strategies, and another way to address the difficulties students face in solving mathematical verbal problems is to guide them to perceive verbal problems as story problems. This is supported by the Teacher Education Program through school support in India or TESS, which encouraged the use of storytelling as a tool for understanding verbal problems. In this way, TESS believed that presenting verbal problems as story problems could help students who face difficulties when trying to understand the context of verbal problems (Rosli et al., 2020). Previous studies have shown the importance of the study; **Akgun et al., (2012)** conducted a study on the student's ability to use mathematical knowledge to assist in problem-solving. The study sample consisted of (97) third-year students in the primary mathematics education department in Turkey, and the study tool

was a questionnaire for students. The results indicated that students face difficulties in problem-solving tests in skills such as interpretation, logic, correlation, critical thinking, and integrating real-life problems with applications in various fields such as medicine, science, physics, and mathematics education. **Al-Malaki's study (2018)**, which aimed to identify the types of metacognitive strategies used by first-year secondary students in Makkah and their relationship to their ability to solve verbal mathematical problems, used a descriptive approach. The researcher prepared and applied two study tools: a metacognitive strategies scale and a verbal mathematical problem-solving test on a stratified random sample of first-year secondary students in Jeddah, consisting of (145) students. The results of the study revealed a weakness in the ability of the sample individuals to solve verbal mathematical problems as required, and they rarely use metacognitive strategies such as verbal expansion, conceptual expansion, repetition, and meaningful organization while learning mathematics. There is a statistically significant positive correlation between metacognitive strategies and the ability to solve verbal mathematical problems. The study recommended the necessity of providing students with knowledge and skills related to metacognitive strategies and training them on these strategies, as well as conducting remedial programs for students in the area of solving verbal mathematical problems. **The study by Sultan and Al-Shahri (2019)** titled "Remedial Program for Difficulties in Solving Verbal Mathematical Problems Among Third Grade Intermediate Female Students" aimed to identify the appropriate skills for solving verbal mathematical problems among third-grade intermediate female students, recognize the difficulties in solving them, and provide a remedial program for these difficulties. The study used a descriptive approach, and to collect data, a diagnostic test for difficulties in solving verbal mathematical problems was prepared and applied to a random sample of (600) female students from the third intermediate grade in the Asir region. The study identified a set of appropriate skills for solving verbal mathematical problems within the stages of understanding, planning, execution, and evaluation. The results of the study indicated the presence of difficulties in solving verbal mathematical problems among the female students in the research sample, ranging from high to medium, low, and nonexistent. The study recommended several recommendations, the most important of which are to activate the use of the proposed program, utilize different and diverse strategies to develop the skills of solving verbal mathematical problems among female students, and provide training courses for mathematics teachers in this field. **A study by Al-Jundi (2020)** titled "Using the Cognitive Apprenticeship Model to Develop Problem-Solving Skills in Verbal Mathematical Problems and Productive Mathematical Disposition Among Primary School Students" aimed to investigate the mathematics achievement of fifth-grade students and their skills in solving verbal mathematical problems and their productive mathematical disposition using the cognitive apprenticeship model. The researcher used a quasi-experimental design with experimental and control groups, including pre-test and post-test measurements. The sample consisted of (70) male and female students from a fifth-grade class in a school in West Tanta, Egypt, divided into two equal groups of (35) students each, with one group serving as the experimental group and (35) as the control group. The researcher prepared a teacher's guide according to the strategy used and also developed and administered a test for academic achievement, a test for solving verbal mathematical problems, and a measure for productive mathematical disposition. The results of the study showed statistically significant differences at the (0.05) level between the mean scores of the students in the experimental and control groups in the post-application of both the academic achievement test, the verbal mathematical problem-solving test, and the measure of productive mathematical disposition. Additionally, there was a significant correlation between the scores of the students in both groups on the academic achievement test, the verbal mathematical problem-solving test, and the measure of productive mathematical disposition. The study recommended incorporating the cognitive apprenticeship strategy into the preparation and training programs for primary school mathematics teachers. **A study by Al-Nazwani (2021)** titled "A Proposed Strategy to Enhance the Level of Algebraic and Geometric Representation Skills for Verbal Mathematical Problems and Their Solution Among Eighth Grade Students in the Dhofar Region of Oman" aimed to investigate the effectiveness of a proposed teaching strategy to improve eighth-grade students' abilities in algebraic and geometric representation of verbal mathematical problems and their solutions. The researcher employed a descriptive methodology and a quasi-experimental design with experimental and control groups, including pre- and post-tests. The experimental group consisted of (99) students, while the control group included (106) students. The study tools included two diagnostic tests in the units of "Geometry" and "Functions and Equations," a test for skills in representing and solving verbal geometric problems, a test for skills in representing and solving

verbal algebraic problems, as well as a questionnaire for mathematics supervisors and teachers. The results of the study indicated the superiority of the experimental group. The study recommended utilizing the classification of algebraic and geometric representation skills for verbal problems and their solutions in mathematics teaching, with increased attention to verbal mathematical problems and their solutions. The researcher benefited from previous studies in writing the theoretical framework, which helped to clarify the study problem, determine its significance and necessity, and specify the study methodology and appropriate statistical methods to achieve the study objectives (designing the questionnaire for the current study, selecting suitable statistical methods for the current study, and constructing the theoretical framework for the current study).

Study Problem : As a result of the researcher's work in teaching mathematics curricula, it has become clear that the Ministry of Education in the Kingdom of Saudi Arabia is moving towards a comprehensive development of mathematics and science curricula by relying on distinguished global experiences through the alignment and localization of American global series in teaching mathematics, including the Majer and Hill series at all stages of general education, in line with developed countries to build a positive generation capable of solving the problems it faces. This development is reflected in the emphasis on solving mathematical problems from the lower stages (Al-Areeni, 2017). Therefore, indicators have emerged that highlight the difficulty of solving problems and the low level of students in mathematics across various educational stages (Al-Sumadi and Al-Naqeeb, 2017); many previous studies, including those by (Abdul Qadir, 2017; Baa'zi, 2013; Al-Aasi, 2013; Al-Omari, 2012; Al-Rajeh, 2015, Al-Asmari, 2016), have shown a decline in student achievement in mathematics, particularly the weakness of students in solving verbal problems at all educational levels. Teachers face several challenges and difficulties in teaching how to solve verbal problems, some of which are related to student difficulties such as reading difficulties and understanding the problem, memory and attention difficulties, weak mathematical abilities, inability to represent the problem, and low motivation levels among students. Other challenges relate to the problem itself, such as the increased number of steps in the problem, the presence of extraneous information in the problem, and the arrangement of information differing from the order of the solution steps. Additionally, there are educational factors that represent educational challenges, such as the teaching methods used and the mismatch between the problem and the ages of the students, and the weakness in curriculum preparation and educational materials, as well as the lack of incentives that enhance motivation for learning and love for mathematics (Abdul Qadir, 2017). The researcher relies on the TIMSS report for 2019 issued by the Education and Training Evaluation Commission in the Kingdom, which revealed that the most significant finding was the lack of progress in the performance of fourth-grade students over the three different assessment periods (2011, 2015); the results showed that students lacked problem-solving skills, particularly in simple mathematical problems involving numbers made up of three or four digits using basic mathematical knowledge. Half of the students could not reach the low international benchmark, indicating their lack of basic mathematical knowledge expected of their peers at this age. Most studies confirmed that the level of mathematics teachers' use of strategies for solving verbal mathematical problems was low to moderate, such as the study of Ben Mardah (2022), the study of Al-Nazwani (2021), the study of Al-Awaji and Hussein (2020), the study of Sultan and Al-Shahri (2019), and the study of Al-Sumadi and Al-Naqeeb (2017). Previous studies agreed on the existence of difficulties in solving mathematical and verbal problems among students at different educational stages, such as the study of Sun and Greer (2022), the study of Al-Ghamdi and Quduri (2019), the study of Hamadna and Hamadna (2019), the study of Al-Arini (2017), and the study of Berteletti et al., (2014). In light of this, the current study aims to identify the difficulties in solving verbal mathematical problems among high school students in the Qunfudhah Governorate from the perspective of mathematics teachers.

Study Questions: In light of the study problem, the current study sought to answer the following main question: "What are the difficulties faced by high school students in Al-Qunfudhah Governorate from the perspective of mathematics teachers in solving verbal mathematical problems?" This question branches into the following sub-questions:

The first question: What is the level of mathematics teachers' use of strategies for solving verbal mathematical problems at the high school level?

The second question: Are there statistically significant differences in the level of mathematics teachers' use of strategies for solving verbal mathematical problems at the high school level based on the variables (gender, educational qualification, number of years of experience, number of training courses in verbal mathematical problems)?

Study Objectives: The current study aimed to achieve the following objectives:

- To identify the level of mathematics teachers' use of strategies for solving verbal mathematical problems at the high school level.
- To identify the existence of statistically significant differences in the level of mathematics teachers' use of strategies for solving verbal mathematical problems at the high school level based on the variables (gender, educational qualification, number of years of experience, number of training courses in verbal mathematical problems).

Importance of the Study: The importance of the study is highlighted through the following:

Theoretical Importance:

- The significance of this study lies in its illumination of one of the global standards in mathematics education, represented by solving verbal mathematical problems, as well as the strategies and methods that assist students in achieving a deep understanding of these problems, thereby facilitating their resolution.
- It is considered a modern study in response to contemporary educational trends in mathematics teaching, which are employed in solving verbal mathematical problems.
- The current study may benefit mathematics teachers by familiarizing them with methods that develop thinking and enhance students' abilities and skills in solving mathematical problems.
- It serves to benefit educational supervisors in mathematics by providing them with strategies and educational methods to train mathematics teachers on employing strategies for solving verbal mathematical problems.
- This study may inform educational supervisors about the strengths and weaknesses of high school teachers in the area of employing strategies for solving verbal mathematical problems.
- It may provide those responsible for developing high school mathematics curricula with a list detailing the difficulties faced by high school teachers that hinder them from employing strategies for solving verbal mathematical problems, allowing for efforts to address these issues.

Practical Importance: The study presents practical benefits at multiple levels, including:

For curriculum planners: This study may assist curriculum planners in incorporating strategies for solving verbal mathematical problems into mathematics curricula and textbooks.

For educational supervisors: By guiding mathematics teachers and training them to employ strategies for solving verbal mathematical problems.

For mathematics teachers: To draw the attention of mathematics teachers to the application of strategies that can be used to solve verbal mathematical problems at the secondary school level, and to develop their teaching skills concerning the instruction of verbal mathematical problems and their solution strategies.

Study Limitations

Human, Spatial, and Temporal Limitations: The current study is limited to mathematics teachers in public secondary schools affiliated with the Ministry of Education during the first semester of the academic year (1446 AH) in the Al-Qunfudhah Governorate.

Objective Limitations: The current study is limited to identifying the difficulties in solving verbal mathematical problems among secondary school students in employing the following verbal

problem strategies: (general strategy for solving mathematical problems, table creation strategy, logical justification strategy, simpler problem-solving strategy, pattern seeking strategy, model creation strategy, guessing and checking strategy, backward solving strategy, and drawing a picture strategy).

Terminological and Procedural Definitions of Study Terms

Verbal Math Problem: Defined by Badawi (2007) as a quantitative situation presented in the form of words, this situation contains a question that requires an answer, and does not explicitly indicate the operations or steps that should be used to reach that answer. Instead, some relationships among its elements can be revealed through sound reasoning rather than through customary recall. The researcher defines it operationally as a quantitative mathematical situation formulated in words to facilitate students' resolution through sequential, integrated, and coherent steps.

Verbal Math Problem Solving: Al-Malaki (2018) defines the solution to a verbal math problem as a process in which the student uses their prior knowledge and acquired skills to address an unconventional mathematical situation they encounter. They must reorganize what they have previously learned in terms of mathematical information and skills, applying it to the new educational situation they face. The researcher defines it operationally as the process in which high school students utilize their prior and acquired knowledge to arrive at a solution for an unconventional mathematical situation.

Verbal Math Problem Solving Strategies: Al-Omari (2012) defines it as a set of methods or techniques that can be used to solve mathematical problems. The researcher defines it operationally as a series of sequential and integrated operations and procedures employed by high school mathematics teachers to enable their students to reach a solution to the verbal math problem.

Methodology and Procedures: This chapter presents the study's methodology, its population and sample, the study tool, the design procedures, their validity and reliability, its variables, practical procedures, and the statistical methods that were used.

Study Methodology: The researcher employed a descriptive survey methodology.

Study Population: The study population consisted of all mathematics teachers at the secondary level in public education schools for both males and females affiliated with the Education Department in Al-Qunfudhah Governorate for the academic year (1446 AH), totaling (844) teachers.

Study Sample: The study sample included (80) mathematics teachers from the secondary level in public education schools under the Education Department in Al-Qunfudhah Governorate, selected using simple random sampling. Table (1) shows the distribution of the number of sample members according to the study variables.

Table (1): ***Distribution of the Number of Sample Members according to the Study Variables***

Variable	Levels of the Variable	Sample	Percentage (%)
Gender	Male	45	56
	Female	35	44
Educational Qualification	Bachelor's Degree	54	67.5
	Master's and Doctorate	26	32.5
Experience	Less than 5 years	22	27.5
	5 to 10 years	28	35
	More than 10 years	30	37.5
Training Courses	Completed a course	36	45
	Did not complete any course	44	55
Total		**80**	**100%**

Study Tool: To collect the necessary information to answer the study questions, a questionnaire was constructed according to the following steps:

- Determine the purpose of the questionnaire: The purpose is to identify the level of mathematics teachers' employment of strategies for solving verbal mathematical problems at the secondary stage.
- Reviewing previous studies and the theoretical literature related to the subject of the study.
- Determine the components of the questionnaire. **Based on the above, the components of the questionnaire were identified in two parts:**

First Part: Preliminary Information: This includes the introduction to the questionnaire, the definition of its purpose, the method of answering its items, and then the preliminary data of the sample in the current study, which are: (gender, educational qualification, number of years of experience, number of training courses in verbal mathematical problems).

Second Part: Questionnaire and Statements Axes: The questionnaire consisted of nine axes regarding the extent to which teachers employed each of the following nine strategies (general strategy for solving mathematical problems, strategy for creating a table, strategy for logical justification, strategy for solving a simpler problem, strategy for pattern searching, strategy for creating a model, strategy for guessing and checking, strategy for solving backwards, strategy for drawing a picture). The first axis was divided into four dimensions: understanding the problem, planning to solve the problem, executing the solution plan, and verifying the correctness of the solution. The statements in each axis and dimension were derived from the previous axes and dimensions, resulting in a total of (62) paragraphs distributed across the nine axes. The following table illustrates the distribution of Items across the axes:

Table (2): ***Distribution of Questionnaire Items Across the Axes***

Axis	**Dimension**	**Number of Items**
First Axis	First Dimension	6
	Second Dimension	7
	Third Dimension	3
	Fourth Dimension	4
Second Axis		5
Third Axis		7
Fourth Axis		5
Fifth Axis		6
Sixth Axis		4
Seventh Axis		5
Eighth Axis		5
Ninth Axis		5
Total		**62**

Psychometric Properties of the Questionnaire:

Apparent Validity of the Questionnaire: This was achieved by distributing the questionnaire in its preliminary form to a group of expert judges specialized in the field of study to express their opinions regarding the questionnaire and its suitability for its intended purpose, as well as the relevance of each statement to the axis it belongs to, in addition to the adequacy of the axes and statements in general and their ability to measure what they were designed to measure. The experts provided a set of observations that reflected the appropriateness of the tool for its intended purpose, the necessity to rephrase some statements to make them more understandable for the sample, and the deletion or addition of certain statements.

Internal Consistency: Internal consistency was verified using Pearson correlation coefficient to calculate the correlation coefficients between the score of each statement in the various axes with the total score of the axis to which the statement belongs and with the total score of the questionnaire as a whole, to ensure the cohesion of the statements within each axis and their homogeneity with each other. The results of the Pearson correlation coefficient calculation were as follows:

Results of the correlation coefficients for the statements of the questionnaire according to the axes:

1. First Axis:

Table (3): ***Correlation Coefficients Between the Scores of the Questionnaire Statements in the Axes and Dimensions with the Total Score for Each Dimension or Axis and for the Questionnaire as a Whole.***

The Axis	m	Correlation Coefficient with Dimension or Axis	Correlation Coefficient with Questionnaire as a Whole	m	Correlation Coefficient with Dimension or Axis	Correlation Coefficient with Questionnaire as a Whole	m	Correlation Coefficient with Dimension or Axis	Correlation Coefficient with Questionnaire as a Whole
First Dimension	1	.750	.440	3	.834	.623	5	.763	.520
	2	.758	.582	4	.740	.737	6	.724	.452
Second Dimension	1	.631	.524	4	.834	.578	7	.797	.653
	2	.794	.573	5	.898	.633			
	3	.852	.735	6	.847	.679			
Third Dimension	1	.900	.672	2	.935	.688	3	.868	.691
Fourth Dimension	1	.951	.841	3	.910	.739			
	2	.927	.823	4	.822	.747			
Second Axis	1	.861	.757	3	.895	.671	5	.795	.744
	2	.927	.735	4	.902	.724			
Third Axis	1	.906	.844	4	.877	.839	7	.958	.882
	2	.929	.864	5	.895	.796			
	3	.906	.843	6	.918	.865			
Fourth Axis	1	.911	.744	3	.913	.813	5	.942	.852
	2	.883	.798	4	.850	.744			
Fifth Axis	1	.951	.832	3	.939	.804	5	.973	.869
	2	.911	.795	4	.940	.826	6	.952	.869
Sixth Axis	1	.909	.841	3	.885	.854			
	2	.962	.875	4	.963	.886			
Seventh Axis	1	.797	.704	3	.918	.806	5	.895	.794
	2	.932	.808	4	.948	.825			
Eighth Axis	1	.849	.846	3	.921	.819	5	.962	.816
	2	.923	.803	4	.927	.785			

Ninth Axis	1	.887	.806	3	.904	.796	5	.792	.638
	2	.897	.821	4	.920	.826			

It is noted from the previous table that all correlation coefficients between the scores of the statements of each dimension or axis and the total score of the corresponding dimension and the total score of the questionnaire as a whole are high, positive, and statistically significant at the (0.01) level, which confirms the consistency, homogeneity, and cohesion of the items with each other.

Stability of the questionnaire: The stability of the scores of the axes of the questionnaire was verified using Cronbach's Alpha stability coefficient, based on the results of applying the questionnaire to the exploratory sample. The results are as shown in the following table:

Table (4): ***Stability Coefficient of Questionnaire by Cronbach Alpha Method***

Axis	**Dimension**	**Cronbach's alpha**
First Axis	First Dimension	0.801
	Second Dimension	0.854
	Third Dimension	0.752
	Fourth Dimension	0.811
Second Axis		0.903
Third Axis		0.861
Fourth Axis		0.781
Fifth Axis		0.855
Sixth Axis		0.901
Seventh Axis		0.882
Eighth Axis		0.912
Ninth Axis		0.862
Overall Total		**0.842**

It is evident from Table (4) that all correlation transactions using Cronbach's alpha for the sub-dimensions are acceptable values for conducting the final application.

Response method for the questionnaire items: Responses to the questionnaire items are made by selecting from five options according to the five-point Likert scale (Very High, High, Medium, Low, Very Low), which correspond to the following scores in order (5-4-3-2-1). The following criteria were relied upon to identify the difficulties in solving verbal mathematical problems among high school students in the Al-Qunfudhah Governorate from the perspective of mathematics teachers, based on the arithmetic means of the items and the weighted averages of the dimensions and axes, as follows:

Weights were assigned to the alternatives (Very High = 5, High = 4, Medium = 3, Low = 2, Very Low = 1), and then those responses were classified into five equal-range levels using the following equation: (Category length = (largest value - lowest value) ÷ number of tool alternatives = (5 – 1) ÷ 5 = 0.8).

Table (5): ***Distribution of Categories According to the Gradient Used in the Study Tool (Questionnaire)***

Degree of Approval	**Range of Averages**
Very High	Above 4.2
High	Bigger than 3.4 up to 4.2
Medium	Bigger than 2.6 up to 3.4
Low	Bigger than 1.8 up to 2.6
Very Low	From 1.00 to 1.8

Statistical methods used in the study: Several statistical methods were employed using the Statistical Package for the Social Sciences **(SPSS)**, as follows: the use of means and standard deviations, Cronbach's alpha coefficient to verify the reliability of the questionnaire, Pearson correlation coefficient to ensure the validity of internal consistency of the questionnaire, independent samples T-test, one-way analysis of variance, and Scheffé test for post-test comparisons.

Study results and discussion: The results related to the first question, which states: "What is the level of employment of mathematics teachers in verbal problem-solving strategies at the secondary stage?" To answer this question, means and standard deviations were calculated for all items of each dimension or axis in the questionnaire, and the results of each dimension or axis were presented separately:

First Axis: The extent to which teachers employ the general strategy in solving mathematical problems: The arithmetic mean of the total responses from the study sample on all items of the axis with its four dimensions reached (3.39), which corresponds to a medium degree. This indicates that the difficulty level of mathematics teachers in employing general strategies to solve mathematical problems is average. The researcher attributes this result to the teachers' interest in utilizing the general strategy in solving mathematical problems, especially since problem-solving has become increasingly important in mathematics education, and the Ministry of Education in the Kingdom of Saudi Arabia is focused on these new trends related to mathematics, particularly in the area of solving verbal problems and equipping high school students with the skills to solve them. This result is consistent with the findings of Al-Nazwani's study (2021). **As for the results of the dimensions of this axis, they are illustrated as follows:**

-The first dimension: understanding the problem

Table (6): ***Arithmetic Averages and Standard Deviations of the Sample Answers to the Items of the First Dimension in the First Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I ask the students to read the verbal mathematical problem silently	3.43	.897	High	2
2	I ask one of the students to read the problem out loud clearly	3.33	.897	Medium	3
3	I discuss the students about the mathematical concepts in the problem	3.49	.811	High	1
4	I ask the students to identify the given data in the problem	3.15	.901	Medium	6
5	I discuss with the students the sufficiency, excess, and missing data	3.16	.961	Medium	5
6	I encourage the students to express the problem in their own words, orally or in writing	3.29	.889	Medium	4
Total		3.31	.599	**Medium**	

It is noted from Table (6) that the arithmetic averages of the responses of the study sample to the total of the first dimension (understanding the problem) of the general strategy for solving the problem has reached (3.31), which corresponds to the degree of (medium), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.15) and (3.49), which corresponds to two degrees (medium and high). It came in first place (I discuss students about the mathematical concepts contained in the text of the problem) with an arithmetic average of (3.49), with a degree of (high), and in the last place came the phrase (I assign students to determine the data contained in the problem) with an arithmetic average of (3.15) with a degree of (medium). The researcher attributes these results to the importance of the steps (understanding the problem) for teachers and students, which leads to thinking properly and a smooth transition to the second step in the general strategy to solve the problem, and teachers' awareness of the difficulties that students face while solving verbal mathematical problems, including the difficulties that belong to the teacher, or with regard to the nature of the issue, so the teachers' application of the steps to understand the issue may alleviate these difficulties and make the student start correctly based on his understanding of everything related to the issue, which It leads to its easy solution. This result is consistent with the results of the study of Al-Maliki (2018).

-The second dimension: planning to solve the problem

Table (7): ***Arithmetic Averages and Standard Deviations of the Sample Answers for the Items of the Second Dimension in the First Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I assign students to connect between the given data and the required	3.36	.889	Medium	3
2	I guide students to analyze the required problem into several subtasks	3.26	.990	Medium	7
3	I help students recall previous experiences required to solve the problem	3.36	.958	Medium	3
4	I assign students to create an illustrative drawing to demonstrate their understanding of the problem	3.29	1.058	Medium	5
5	I guide students to plan to accomplish each subtask separately	3.44	.884	High	1
6	I ensure that students develop an appropriate plan to solve the problem	3.39	.948	Medium	2
7	I guide students to diversify their methods of solving the problem	3.28	1.043	Medium	6
Total		3.34	.759	Medium	

It is noted from Table (7) that the arithmetic averages of the responses of the study sample on the total of the second dimension (planning to solve the problem) of the general strategy for solving the problem has reached (3.34), which indicates the degree (medium), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.26) and (3.44), which corresponds to two degrees (medium and high). It came in first place (directing students to plan for the completion of each sub-task separately) with an arithmetic average of (3.44), with a degree (high), and in last place came the phrase (directing students to analyze the required in the issue for several subtasks) with an arithmetic average of (3.26) with a degree (medium). The researcher attributes these results to the fact that the difficulties students face in solving the problem may be due to their inability to plan it well.

The third dimension: the implementation of the solution plan

Table (8): ***Arithmetic Averages and Standard Deviations of Sample Answers for the Third Dimension Items in the First Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I monitor students in executing the procedures for each subtask in the solution plan	3.49	.941	High	2
2	I monitor students' adherence to implementing the problem-solving plan	3.49	.941	High	2
3	I ensure that students reach the solution to the problem	3.50	.914	High	1
Total		3.49	.792	**High**	

It is noted from Table (8) that the arithmetic averages of the responses of the study sample on the total of the third dimension (implementation of the problem solving plan) of the general strategy for solving the problem has reached (3.49), which indicates to a degree of (high), and with regard to the

statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.49) and (3.50), which corresponds to the degree (high) for all three paragraphs. In the first place came the phrase (I make sure that students reach the solution of the problem) with an arithmetic average of (3.50), with a degree of (high), and in the last place came the two phrases (I follow the student during the implementation of the procedures of each sub-task in the solution plan), and (I follow the student's commitment to implement the problem solving plan) with an arithmetic average of (3.49) with a degree of (high).

-Fourth dimension: validation of the solution

Table (9): ***Arithmetic Averages and Standard Deviations of Sample Answers for the Fourth Dimension Items in the First Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I assign students to verify the correctness of the calculations in the solution steps	3.98	1.091	High	1
2	I assign students to verify the correctness of the problem's solution result	3.38	1.048	Medium	3
3	I guide students to the appropriate method for checking the reasonableness of the result	3.34	1.078	Medium	4
4	I assist students in addressing errors in the solution steps	3.44	1.112	High	2
Total		3.53	.779	**High**	

It is noted from Table (9) that the arithmetic averages of the answers of the study sample on the total of the fourth dimension (validation of the solution) of the general strategy for solving the problem has reached (3.53), which indicates a degree of (high), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the values (3.34) and (3.98), which corresponds to the degree of (medium and high). It came in first place (students were tasked with verifying the correctness of performing calculations in the solution steps) with an arithmetic average of (3.98), and a degree of (high), and in last place came the phrase (I direct students to the appropriate way to verify the reasonableness of the result) with an arithmetic average of (3.34) with a degree of (medium). The researcher explains that the step of validating the solution is one of the most important steps in solving the problem in general, and the verbal problem in particular because of the students' need to prove or evidence that what they have taken of the steps is correct and that the result is also correct.

-The second axis: the extent to which teachers employ the strategy of creating a table

Table (10): ***Arithmetic Averages and Standard Deviations of the Sample Answers to the Items of the Second Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I assign students to read the problem carefully to understand it	3.30	1.072	Medium	5
2	I help students organize the information provided in the problem	3.46	1.102	High	2
3	I encourage students to organize the problem's information in a table or list	3.41	1.052	High	4
4	I aim to reveal the organized list in building the solution plan to students	3.43	1.167	High	3

5	I assign students to implement the solution plan and verify the solution's correctness	3.68	1.178	High	1
Total		3.46	.869	**High**	

It is noted from Table (10) that the arithmetic averages of the answers of the study sample on the overall total of the second axis (the extent to which the parameters employ the strategy of creating a table) has reached (3.46) and came with a degree of (high), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the values (3.30) and (3.68), which corresponds to the degree of (medium and high). It came in first place (I assign students to implement the solution plan and validate the solution) with an arithmetic average of (3.68), with a degree of (high), and in last place came the phrase (I assign students to read the problem well to understand it) with an arithmetic average of (3.30) with a degree of (medium). The researcher interprets this as reflecting the significant attention that the Saudi Ministry of Education has given to solving mathematical problems, especially verbal ones, as stated in the mathematics teacher standards issued by the Education and Training Evaluation Commission (2020): solving mathematical problems and employing its strategies. This indicates that it is one of the most important standards that a mathematics teacher must possess and work to apply and utilize its strategies.

- **The third axis: the extent to which teachers employ the logical justification strategy**

Table (11): ***Arithmetic Averages and Standard Deviations of Sample Answers for the Items of the Third Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I assign students to read the problem correctly	4.03	1.091	High	4
2	I assign students to identify the given data and the required solution in the problem	3.79	1.076	High	6
3	I help students understand and simplify the problem using one of the problem simplification methods	3.73	1.055	High	7
4	I encourage students to represent the problem visually	4.31	1.001	Very High	3
5	I assign students to clarify how they connected the given facts in the problem	3.95	.926	High	5
6	I assist students in performing logically justified steps to solve the problem	4.63	.603	Very High	1
7	I ask students to implement the solution plan and verify its correctness	4.50	.694	Very High	2
Total		4.13	.456	**High**	

It is noted from Table (11) that the arithmetic averages of the answers of the study sample on the total of the third axis, the extent of the parameters' employment of the logical justification strategy, has reached (4.13) and indicates the degree of approval to a degree (high), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.73) and (4.63), which corresponds to two degrees of approval (high and very high). It came in first place (I help students take logically justified steps to reach the solution to the problem) with an arithmetic average of (4.63), and a degree of (very high), and in the last place came the phrase (I help students understand and simplify the problem using one of the methods of simplifying the problem) with an arithmetic average of (3.73) and a degree of (high). This explains that teachers' awareness of the importance of solving verbal problems for students; mastering verbal problems is

extremely important to help students connect mathematics to real life and succeed in school and beyond. Moreover, solving problems does not solely depend on the students, but teachers also bear the responsibility of applying the appropriate strategy to teach students effectively.

-The fourth axis: the extent to which teachers employ a strategy to solve a simpler problem

Table (12): ***Arithmetic Averages and Standard Deviations of Sample Answers for the Items of the Fourth Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I explain to students when the problem should be simplified and broken down	3.23	.900	Medium	5
2	I encourage students to read the problem carefully and identify the given data and what is required	3.35	.887	Medium	1
3	I ask students to break the problem into smaller, less complex problems and solve each sub-problem sequentially	3.25	.961	Medium	4
4	I assign students to connect the solutions of the sub-problems to find an integrated solution to the problem	3.30	.906	Medium	2
5	I ask students to verify the correctness of the solution	3.29	.889	Medium	3
Total		3.28	.693	**Medium**	

It is noted from Table (12) that the arithmetic averages of the answers of the study sample on the total of the fourth axis, the extent to which teachers employ a strategy to solve a simpler problem, has reached (3.28) and refers to the degree of (medium), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.23) and (3.35), which corresponds to the degree of (medium). It came in first place (I encourage students to read the issue well and determine the data in it and what is required) with an arithmetic average of (3.35), and a degree of (medium), and in last place came the phrase (explain to students when the problem should be simplified and fragmented) with an arithmetic average of (3.23) and a degree of (medium). The researcher interprets this as the teachers' commitment to achieving the goals of mathematics education at the secondary level, of which the objective of developing students' problem-solving abilities is one of the most important. This cannot be achieved unless teachers utilize appropriate strategies that guide and assist students in continuously solving problems.

-The fifth axis: the extent to which teachers employ the strategy of searching for a pattern

Table (13): ***Arithmetic Averages and Standard Deviations of the Sample Answers for the Fifth Axis Items of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I encourage students to reread the problem until they can identify the data and the required solution	3.33	.808	Medium	3
2	I assign students to search for the correct pattern of the problem	3.11	.842	Medium	5
3	I ask students to ensure that the pattern is consistent and continuous	3.08	.911	Medium	6
4	I ask students to complete the pattern after identifying it	3.20	.770	Medium	4

5	I guide students to use the pattern to find the appropriate solution to the current problem	3.44	.726	High	2
6	I encourage students to reread the problem until they can identify the data and the required solution	3.68	.652	High	1
Total		3.30	.485	**Medium**	

It is noted from Table (13) that the arithmetic averages of the answers of the study sample on the total of the fifth axis, the extent of teachers' employment of the strategy of searching for a pattern, has reached (3.30) and refers to the degree of (medium), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the values (3.08) and (3.68), which corresponds to the degrees of (medium and high). It came in first place (I encourage students to repeat reading the problem so that you can determine the data and what is required in it) with an arithmetic average of (3.68), and a degree of (high). In last place came the phrase (I ask students to make sure that the pattern is regular and continuous) with an arithmetic average of (3.08) and a degree of (medium). The researcher explains that some verbal problems included in the high school curriculum require the use of this strategy, especially since discovering patterns has become one of the essential skills that learners must master and acquire through mathematics. Therefore, teachers are keen to apply the steps related to this strategy while solving verbal problems to equip students with the ability to discover the pattern and then solve the problem accordingly. Verbal problems in mathematics constitute a part of real mathematics education that contributes to problem-solving, as they provide rich "realistic" situations that play an important role in the learning process (Van den Heuvel-Panhuizen & Drijvers, 2014).

- **The sixth axis: the extent to which teachers employ the strategy of creating a model**

Table (14): ***Arithmetic Averages and Standard Deviations of the Sample Answers on the Items of the Sixth Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I contribute to reviewing the problem's data and what is required from it	3.55	.855	High	2
2	I help students build a plan to solve the problem	3.45	.913	High	3
3	I encourage students to clarify the given problem by drawing a model to find the correct solution	3.74	.707	High	1
4	I guide students to verify the solution's correctness using the appropriate method	3.44	.926	High	4
Total		3.54	.594	**High**	

It is noted from Table (14) that the arithmetic averages of the answers of the study sample on the total of the sixth axis, the extent to which teachers employ the strategy of creating a model, has reached (3.54), which indicates a degree of approval to a degree (high), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.44) and (3.74), which corresponds to a degree (high). It came in first place (I encourage students to clarify the given problem by drawing a model to find the correct solution) with an arithmetic average of (3.74), and a degree of (high), and in last place came the phrase (I encourage students to verify the validity of the solution in the appropriate way) with an arithmetic average of (3.44) and a degree of (high). The previous results are attributed to the importance of the strategy of creating a model for students, as it contributes to developing their ability to form visual representations when faced with complex or lengthy problem-solving tasks, especially among students who prefer the (visual) learning style and tend to convert settings and information into symbolic forms or visual representations. The previous results are explained based on what has been emphasized in the Mathematics Teachers' Standards issued by the Education and Training

Evaluation Commission (2020), which aligns with the results of the study (Sarjana, et al., 2020) that demonstrated that students' ability in mathematical modeling significantly influenced their ability to solve verbal problems.

-The seventh axis: the extent to which teachers employ the guessing and verification strategy

Table (15): ***Arithmetic Averages and Standard Deviations of Sample Answers for the Items of the Seventh Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I help students review the previous lesson related to the problem-solving strategy as an introduction	3.49	1.158	High	3
2	I help students think about the problem and extract the given data and what is required from it	3.66	.993	High	2
3	I ask students to guess a suitable and logical solution to the problem	3.43	1.199	High	4
4	I motivate students to find alternative solutions to the problem	3.73	.968	High	1
5	I guide students to continue guessing and proposing solutions to the problem until reaching the correct solution	3.40	.963	Medium	5
Total		3.54	.870	**High**	

It is noted from Table (15) that the arithmetic averages of the answers of the study sample on the total of the seventh axis, the extent of teachers' employment of the guessing and verification strategy, has reached (3.54), which indicates a degree of approval to a degree (high), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.40) and (3.73), which corresponds to two degrees (medium and high). It came in first place (I motivate students to find other solutions to the problem) with an arithmetic average of (3.73), and a degree of (high), and in last place came the phrase (I direct students to continue to guess and propose solutions to the problem until reaching the correct solution) with an arithmetic average of (3.40) and a degree of (medium). The researcher interprets this result for the employment of the guessing strategy as one of the most important strategies for solving problems, where teachers play a crucial role in helping learners organize their work and increase their ability to start anew after a previous guess failure by motivating and guiding them correctly.

- **The eighth axis: the extent to which teachers employ the reverse resolution strategy**

Table (16): ***Arithmetic Averages and Standard Deviations of Sample Answers for the Items of the Eighth Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I assign students to read the problem slowly and with focus	3.31	.851	Medium	2
2	I review with students by using questions to identify both the given data and the required solution	3.25	.879	Medium	4
3	I assign students to show the final result and then solve it backward step by step	3.25	.879	Medium	4
4	I guide students to use inverse operations when working	3.26	.853	Medium	3

	backward (e.g., division instead of multiplication)				
5	I engage students in reviewing the solution to ensure it aligns with the given data	3.48	.927	High	1
Total		3.31	.690	**Medium**	

It is noted from Table (16) that the arithmetic averages of the answers of the study sample on the total of the eighth axis (the extent to which teachers employ the reverse solution strategy) has reached (3.31), which indicates a degree of approval with a degree (medium), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the two values (3.25) and (3.48), which corresponds to two degrees (medium and high). It came in first place (I participate with students in reviewing the solution of the problem to ensure that the solution is consistent with the data) with an arithmetic average of (3.48), and a degree of (high) and in the last place came the two phrases (I review students by employing questions that determine both the data and the required) and (I assign students to show the final result and then solve it inversely step by step) with an arithmetic average of (3.25) and a degree of (medium), and the researcher explains this because this strategy trains students on problem-solving skills elaborately by moving backwards from the final result and then grading step by step.

- **The ninth axis: the extent to which teachers employ the strategy of drawing a picture**

Table (17): ***Arithmetic Averages and Standard Deviations of Sample Answers for the Items of the Ninth Axis of the Questionnaire***

m	Phrase	Arithmetic Average	Standard Deviation	Degree	Arrangement
1	I explain the problem's given data and what is required with the students	3.28	1.113	Medium	2
2	I discuss with students the selection of an appropriate solution plan	3.30	1.107	Medium	1
3	I guide students to use a drawing plan to solve the problem faster and more clearly	3.21	1.177	Medium	4
4	I ask students to create a diagram or illustration and execute the solution plan	3.11	1.125	Medium	5
5	I assign students to verify the answer and review the solution against the problem's given data	3.23	1.158	Medium	3
Total		3.23	.910	**Medium**	

It is noted from Table (17) that the arithmetic averages of the answers of the study sample on the total of the ninth axis (the extent to which teachers employ the strategy of drawing a picture) has reached (3.23) with a degree (medium), and with regard to the statements in this dimension, we find that the arithmetic averages have ranged between the values (3.11) and (3.30) and they correspond to the degree of (medium). It came in first place (I discuss students in choosing the appropriate solution plan) with an arithmetic average of (3.30), and a degree of (medium), and in the last place came the phrase (I ask students to make a drawing or an illustration diagram and implement the solution plan) with an arithmetic average of (3.11) and a degree of (medium). The researcher explains this result to the teachers' conviction of the importance of diversification in strategies for solving verbal problems, especially since each issue may have one or two strategies that are more appropriate than the rest of the strategies, and are consistent with the results of the study of Al-Samadi and Al-Naqib (2017).

Results of the response to the second question: which states: "Are there statistically significant differences in the level of employment of mathematics teachers in verbal problem-solving strategies

at the secondary stage according to the variables (gender, educational qualification, number of years of experience, number of training courses in verbal mathematics problems)?" This question was answered according to each variable separately as follows:

First: Gender variable: The means and standard deviations were extracted, and a T-test for independent samples was conducted for the level of employment of mathematics teachers in verbal problem-solving strategies according to the gender variable. The results are clarified as follows:

Table (18): ***Arithmetic Averages, Standard Deviations and Conducting a Test (T) for Independent Samples of the Level of Employment of Mathematics Teachers for Strategies for Solving Verbal Mathematical Problems According to the Gender Variable***

Dimensions/Axes	Gender	Number	Arithmetic Average	Standard Deviation	T Value	df	Significance Level	Decision
Problem Understanding	Male	45	3.51	.574	3.663	78	0.000	Significant
	Female	35	3.05	.534				
Planning to Solve the Problem	Male	45	3.67	.577	5.124	78	0.000	Significant
	Female	35	2.91	.755				
Executing the Solution Plan	Male	45	3.81	.610	4.646	78	0.000	Significant
	Female	35	3.08	.813				
Verifying Solution Accuracy	Male	45	3.97	.523	7.475	78	0.000	Significant
	Female	35	2.96	.684				
General Strategy	Male	45	3.70	.492	6.707	78	0.000	Significant
	Female	35	2.99	.451				
Strategy of Creating a Table	Male	45	3.96	.486	7.700	78	0.000	Significant
	Female	35	2.81	.832				
Logical Reasoning Strategy	Male	45	4.37	.311	6.599	78	0.000	Significant
	Female	35	3.82	.430				
Simpler Problem-Solving Strategy	Male	45	3.57	.629	4.815	78	0.000	Significant
	Female	35	2.91	.591				
Pattern-Finding Strategy	Male	45	3.41	.408	2.210	78	0.030	Significant
	Female	35	3.17	.548				
Model-Creation Strategy	Male	45	3.79	.433	4.717	78	0.000	Significant
	Female	35	3.23	.628				
Guessing and Verification Strategy	Male	45	3.97	.619	6.009	78	0.000	Significant
	Female	35	2.99	.840				
Reverse Solution Strategy	Male	45	3.51	.387	3.115	78	0.003	Significant
	Female	35	3.05	.888				
Drawing Picture Strategy	Male	45	3.73	.505	7.202	78	0.000	Significant
	Female	35	2.58	.908				
Overall Total of Questionnaire	Male	45	3.77	.283	9.885	78	0.000	Significant
	Female	35	3.07	.357				

It is evident from Table (18) that all values of the significance level in all sub-dimensions and axes, as well as in the overall total of the questionnaire, are statistically significant values. This leads to the conclusion that: "There are statistically significant differences in the level of employment of mathematics teachers regarding strategies for solving verbal mathematical problems at the secondary stage according to the gender variable, with all differences favoring males." The researcher interprets this result as being due to teachers' awareness of the importance of employing strategies for solving verbal problems at the secondary level, regardless of their qualifications.

Teachers, as a result of their work and years of experience, along with the training courses they have received, are knowledgeable about how to employ strategies for solving verbal mathematical problems in mathematics education.

Secondly: Variable of Academic Qualification: The arithmetic averages and standard deviations were extracted, and an independent samples T-test was conducted for the level of employment of mathematics teachers regarding strategies for solving verbal mathematical problems according to the variable of academic qualification. The following clarifies the results:

Table (19): ***Arithmetic Averages, Standard Deviations and Conducting a Test (T) for Independent Samples of the Level of Employment of Mathematics Teachers for Strategies for Solving Verbal Mathematical Problems According to the Academic Qualification Variable***

Dimensions/ Axes	Academic Qualification	Number	Arithmetic Average	Standard Deviation	T Value	df	Significance Level	Decision
Problem Understanding	Bachelor's	54	3.12	.623	-4.357	78	.000	**Significant**
	Master's and PhD	26	3.69	.299				
Planning to Solve the Problem	Bachelor's	54	3.12	.791	-4.098	78	.000	**Significant**
	Master's and PhD	26	3.80	.412				
Executing the Solution Plan	Bachelor's	54	3.27	.876	-3.889	78	.000	**Significant**
	Master's and PhD	26	3.95	.181				
Verifying Solution Accuracy	Bachelor's	54	3.34	.807	-3.407	78	.001	**Significant**
	Master's and PhD	26	3.93	.536				
General Strategy	Bachelor's	54	3.19	.601	-5.081	78	.000	**Significant**
	Master's and PhD	26	3.81	.258				
Strategy of Creating a Table	Bachelor's	54	3.17	.910	-4.687	78	.000	**Significant**
	Master's and PhD	26	4.04	.330				
Logical Reasoning Strategy	Bachelor's	54	4.01	.453	-3.892	78	.000	**Significant**
	Master's and PhD	26	4.40	.339				
Simpler Problem-Solving Strategy	Bachelor's	54	3.12	.733	-3.225	78	.002	**Significant**
	Master's and PhD	26	3.62	.450				
Pattern-Finding Strategy	Bachelor's	54	3.21	.502	-2.687	78	.009	**Significant**
	Master's and PhD	26	3.51	.384				
Model-Creation Strategy	Bachelor's	54	3.41	.641	-3.119	78	.003	**Significant**
	Master's and PhD	26	3.83	.345				
Guessing and Verification Strategy	Bachelor's	54	3.28	.866	-4.218	78	.000	**Significant**
	Master's and PhD	26	4.08	.599				
Reverse Solution Strategy	Bachelor's	54	3.20	.772	-2.099	78	.039	**Significant**
	Master's and PhD	26	3.54	.399				
Drawing Picture Strategy	Bachelor's	54	3.01	.962	-3.203	78	.002	**Significant**
	Master's and PhD	26	3.67	.590				

Overall Total of Questionnaire	Bachelor's	54	3.28	.458	-5.889	78	.000	**Significant**
	Master's and PhD	26	3.84	.213				

It is clear from Table (19) that all significance level values in all sub-dimensions and axes, as well as in the overall total of the questionnaire, are statistically significant values. This leads to the conclusion that: "There are statistically significant differences in the level of employment of mathematics teachers for strategies to solve verbal mathematical problems at the secondary stage according to the variable of academic qualification, with differences favoring those with master's and doctoral degrees." The researcher interprets this by stating that they have been exposed to strategies related to solving mathematical problems and the steps involved in solving them, as well as their positive role in developing students' attitudes towards solving mathematical problems in the educational context. Furthermore, representing the mathematical problem as an integral part of the mathematics curriculum content at the secondary level, along with the presence of numerous mathematical applications formulated as mathematical problems that reference many life tasks that students encounter regularly and continuously, which require precise scientific thinking. This result is consistent with the results of the study of Sultan and Al-Shahri (2019).

Third: Variable of years of experience: To answer this question, the arithmetic averages and standard deviations were extracted, and a one-way ANOVA test was conducted for the level of employment of mathematics teachers for strategies to solve verbal mathematical problems according to the experience variable. The following is an explanation of the results.

Table (20): ***Arithmetic Averages, Standard Deviations and One-Way ANOVA Test for the Level of Employment of Mathematics Teachers for Strategies for Solving Verbal Mathematical Problems According to the Experience Variable***

Dimensions/Axes	**Experience**	**N**	**Arithmetic Average**	**Standard Deviation**	**F Value**	**Significance Level**	**Decision**
Problem Understanding	Less than 5	22	2.96	.761	5.773	.005	**Significant**
	5-10 years	28	3.39	.478			
	More than 10	30	3.48	.467			
Planning to Solve the Problem	Less than 5	22	2.74	.880	13.917	.000	**Significant**
	5-10 years	28	3.42	.639			
	More than 10	30	3.70	.459			
Executing the Solution Plan	Less than 5	22	3.03	.925	6.057	.004	**Significant**
	5-10 years	28	3.60	.798			
	More than 10	30	3.73	.513			
Verifying Solution Accuracy	Less than 5	22	2.99	.818	10.697	.000	**Significant**
	5-10 years	28	3.57	.784			
	More than 10	30	3.89	.485			
General Strategy	Less than 5	22	2.90	.674	15.490	.000	**Significant**

	5-10 years	28	3.47	.483			
	More than 10	30	3.68	.367			
Strategy of Creating a Table	Less than 5	22	2.84	.908	9.976	.000	**Significant**
	5-10 years	28	3.58	.882			
	More than 10	30	3.79	.560			
Logical Reasoning Strategy	Less than 5	22	3.73	.420	16.729	.000	**Significant**
	5-10 years	28	4.30	.381			
	More than 10	30	4.28	.364			
Simpler Problem-Solving Strategy	Less than 5	22	2.82	.809	8.055	.001	**Significant**
	5-10 years	28	3.44	.522			
	More than 10	30	3.48	.596			
Pattern-Finding Strategy	Less than 5	22	3.07	.444	4.830	.011	**Significant**
	5-10 years	28	3.31	.498			
	More than 10	30	3.47	.442			
Model-Creation Strategy	Less than 5	22	3.28	.687	3.079	.042	**Significant**
	5-10 years	28	3.63	.555			
	More than 10	30	3.66	.511			
Guessing and Verification Strategy	Less than 5	22	3.05	.819	5.639	.005	**Significant**
	5-10 years	28	3.66	.849			
	More than 10	30	3.79	.802			
Reverse Solution Strategy	Less than 5	22	2.98	.984	3.875	.025	**Significant**
	5-10 years	28	3.38	.466			
	More than 10	30	3.49	.524			
Drawing Picture Strategy	Less than 5	22	2.74	1.079	4.802	.011	**Significant**
	5-10 years	28	3.40	.785			
	More than 10	30	3.42	.767			
Overall Total of Questionnaire	Less than 5	22	3.03	.461	19.802	.000	**Significant**

	5-10 years	28	3.57	.401			
	More than 10	30	3.69	.315			

It is evident from Table (20) that all significance level values in all sub-dimensions and axes, as well as in the total sum of the questionnaire, are statistically significant. This leads to the conclusion that: "There are statistically significant differences in the level of implementation of mathematics teachers for strategies to solve verbal mathematical problems at the secondary stage according to the variable of the number of years of experience in teaching mathematics." To determine the source of these differences, a Scheffé test for post-hoc comparisons was conducted, and the results showed statistically significant differences in all sub-dimensions and axes, as well as in the total sum of the questionnaire between those with experience (less than 5 years) and those with experience (from 5 to 10 years), in favor of those with experience (from 5 to 10 years). Additionally, there were statistically significant differences in all sub-dimensions and axes, as well as in the total sum of the questionnaire between those with experience (less than 5 years) and those with experience (more than 10 years), in favor of those with experience (more than 10 years). Furthermore, there were no statistically significant differences in all sub-dimensions and axes, as well as in the total sum of the questionnaire between those with experience (more than 10 years) and those with experience (from 5 to 10 years). The researcher interprets this result as a reflection of the renaissance that has followed in the development of mathematics education in the Kingdom, which includes curricula, textbooks, the school environment, the provision of resources and supplies, and teachers, while enhancing their role in applying the standards that they must achieve to ensure the realization of the main objectives of the development process. This includes the commitment of experienced teachers (with more than 10 years of experience) to employ various methods and strategies in teaching mathematics, enabling them to possess skills in utilizing effective teaching practices in the development of mathematics education, including the employment of problem-solving strategies in the secondary stage. This aligns with the recommendations of the Principles and Standards for School Mathematics document (NCTM, 2000) and the results of Al-Jundi's study (2020).

Fourth: The variable of training courses in solving verbal problems: The arithmetic averages and standard deviations were extracted, and a (T) test for independent samples was conducted regarding the level of employment of mathematics teachers for strategies in solving verbal mathematical problems according to the variable of training courses. The following is an explanation of the results:

Table (21): ***Arithmetic Averages, Standard Deviations and Conducting a Test (T) for Independent Samples of the Level of Employment of Mathematics Teachers for Strategies for Solving Verbal Mathematical Problems According to the Training Courses Variable***

Dimensions/Axes	Courses	Number	Arithmetic Average	Standard Deviation	T Value	df	Significance Level	Decision
Problem Understanding	Attended Courses	36	3.51	.574	5.469	78	.000	**Significant**
	Did Not Attend Courses	44	3.05	.534				
Planning to Solve the Problem	Attended Courses	36	3.67	.577	3.718	78	.000	**Significant**
	Did Not Attend Courses	44	2.91	.755				
Executing the Solution Plan	Attended Courses	36	3.81	.610	3.771	78	.000	**Significant**

	Did Not Attend Courses	44	3.08	.813				
Verifying Solution Accuracy	Attended Courses	36	3.97	.523	4.257	78	.000	**Significant**
	Did Not Attend Courses	44	2.96	.684				
General Strategy	Attended Courses	36	3.70	.492	5.474	78	.000	**Significant**
	Did Not Attend Courses	44	2.99	.451				
Strategy of Creating a Table	Attended Courses	36	3.96	.486	5.192	78	.000	**Significant**
	Did Not Attend Courses	44	2.81	.832				
Logical Reasoning Strategy	Attended Courses	36	4.37	.311	4.437	78	.000	**Significant**
	Did Not Attend Courses	44	3.82	.430				
Simpler Problem-Solving Strategy	Attended Courses	36	3.57	.629	4.865	78	.000	**Significant**
	Did Not Attend Courses	44	2.91	.591				
Pattern-Finding Strategy	Attended Courses	36	3.41	.408	3.584	78	.001	**Significant**
	Did Not Attend Courses	44	3.17	.548				
Model-Creation Strategy	Attended Courses	36	3.79	.433	4.110	78	.000	**Significant**
	Did Not Attend Courses	44	3.23	.628				
Guessing and Verification Strategy	Attended Courses	36	3.97	.619	3.527	78	.001	**Significant**
	Did Not Attend Courses	44	2.99	.840				
Reverse Solution Strategy	Attended Courses	36	3.51	.387	3.824	78	.000	**Significant**

	Did Not Attend Courses	44	3.05	.888				
Drawing Picture Strategy	Attended Courses	36	3.73	.505	4.916	78	.000	**Significant**
	Did Not Attend Courses	44	2.58	.908				
Overall Total of Questionnaire	Attended Courses	36	3.77	.283	7.397	78	.000	**Significant**
	Did Not Attend Courses	44	3.07	.357				

It is evident from Table (21) that all values of significance level in all sub-dimensions and axes, as well as in the overall total of the questionnaire, are statistically significant values. This leads to the conclusion that: **"There are statistically significant differences in the level of mathematics teachers' employment of verbal problem-solving strategies at the secondary stage according to the variable of training courses, with differences favoring those who attended training courses."** It is noted from Table (21) that the teachers who received several training courses in solving verbal problems found it sufficient to acquire skills in teaching verbal problem-solving. Furthermore, some teachers may have had a desire to enhance their knowledge and skills, enrolling in additional training courses that enrich their knowledge and skills, which reflects on their degree of employing strategies in teaching verbal problem-solving. This is particularly important given the significant emphasis on teaching how to solve these problems due to their great importance in supporting and developing students' abilities. This has been confirmed by the National Council of Teachers of Mathematics, which stated that problem-solving is essential in learning mathematics, in daily life, and in the workplace, and that the ability to solve problems can lead to great advantages (NCTM, 2000). The National Council recommended a curriculum that develops students' abilities in mathematics, considering the use of thinking and problem-solving as fundamental principles that build and develop mathematical concepts. This result is consistent with the results of Al-Nazwani's study (2021).

Recommendations: Based on the findings of the study, the researcher recommends the following:

-Encouraging mathematics teachers to employ strategies for solving verbal mathematical problems during teaching and to avoid difficulties in their application.

-Training mathematics teachers on strategies for solving mathematical problems in a manner that leads to their understanding of how to apply these strategies in solving verbal mathematical problems.

-Continuously diagnosing the difficulties in solving mathematical problems among students, especially at the secondary education level.

-Training pre-service teachers during their preparation phase on the application of strategies for solving verbal problems in education and integrating them into the teaching methods that are being trained on before service.

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