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The 5th Grade Students'Mathematical Problems SolvingSkills and its Relationship with their Social Skills

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Abstract:
The current research aimed at recognizing the level of 5th Grade Students' Mathematical Problems Solving Skills, Social Skills, and its Relationship between them. The research used the correlative descriptive approach, which is concerned with revealing the relationship between two or more variables to find out the correlation between these variables. The sample of the current research consisted of (58) 5th Grade Students from El-Damam, kingdom of Saudi Arabia**,**the research based on two tests to collect data: a test of mathematical problem-solving skills, and a situations test of social skills. The results of the research revealed that the learners' level of mathematical problem-solving skills in general and in all the sub-skills was medium, except the level of understanding and analyzing the problem skillwas high, The learners'level of social skills as a whole and all the sub-social skills was also medium, , as well as the research found that there is a positive statistically significant relationship at the level (0.01) between the learners' mathematical problem-solving skills and their social skills. The research also found statistically significant differences in mathematical problem-solving skills of learners with high social skills, and learners with low social skills favoring those with high social skills. Recommendations and suggestions for further research were also presented.

Keywords: Mathematical problem-solving skills, social skills, 5th grade primary school students.

Introduction

The ability of individuals to solve problems is fundamental in their lives, especially in thelight of the nature of the current life with its complexity and continuous change, which requires preparing individuals who are able to adapt and face the challenges of this age, and who have the ability to solve problems based on scientific way of thinking. Individuals' problem-solving skills are necessary to help them adapt, solve the problems they face, and take the correct decisions in their lives.

Problems solving is an essential and important pillar in mathematics teaching and learning, and it is more than just finding answers to problems and exercises;it is the process of moving towards achieving the goal when its path is uncertain. The problem arises when there is a clear contrast between the current and the desirable state. Solutions, in turn, refer to ways to customize the available mental resources to reduce the contrast between the current and the desired state (Chaudhry & Rasool, 2012). School Mathematics Problem-Solving Standard forThe National Council of Teachers of Mathematics (NCTM) stated that all students must "construct new mathematical knowledge through problem solving." Thus, problem solving is a means of teaching and learning

allocated to them in the 4th grade tests is 60%, and in the 8th grade tests is 65% (Al-Shamrani et al., 2016), which shows the interest in problem-solving skills in (TIMSS). Problem-solving skills were also included in the Program for International Student Assessment (PISA) tests in 2003 and in 2012 (Ministry of Education, United Arab Emirates, 2013).

Problem solving skills are considered the highest level of intelligence skills, as they go beyond the appropriate and the correct use of rules; they include the selection of previously learned rules and use them creatively to solve new problems that do not include any cues for solution (Obaid et al., 1998).

Problem-solving skills are important in the twenty-first century, as the twenty-first century skills include three categories of skills: learning and creativity skills, media and information technology skills, and life and profession skills. Learning and creativity skills includea number of sub-skills such as: critical thinking, problem solving,Communication and sharing, and innovation and creativity. It is obvious that problem solving skills ranked first in the category of Learning and Creativity Skills, it is also considered one of the basic skills for learning and constructing knowledge, as well as one of the basic requirements for future jobs (Terling& Fadel, 2013).

Because it is a critical component of the 21st century comprehensive education; It has become important to develop learner's understanding about problem-solving skills, their importance, how they can be developed, and it is necessary to increase the learner's awareness of the importance of those skills, increase confidence in his ability to solve problems, mathematics, therefore, learners must have problem-solving skills (NCTM, 1989, 2000). Problem solving is an integral part of teaching and learning mathematics, it is not only a goal to learn it, but a means to achieve it.Throughstudents' active engagement in solving problems, they acquire different ways of thinking, and many habits such as: Perseverance, curiosity, and self-confidence, this is reflected positively on their academic performance in particular, and on their behavior and life in general (NCTM, 2000).Developing students' ability to think and solve problems at all educational levels through the curricula is one of the main functions of Education; mathematics plays a major role in achieving this due to its nature (Abu Zina, 2010). Problem solving is a fundamental reason for learning mathematics (El-Meligy, 2005), and one of the most prominent aspects that distinguish mathematics from other fields isthe content that presents many problems to the students.

The importance of developing mathematical problem-solving skills become clear from including them with high rates in international tests; the dimension of cognitive processes of Mathematicstests in the International Mathematics and Science Study (TIMSS) includes three sub-domains: knowledge, application, and inference. The application field focuses on students' ability to apply Knowledge, theoretical understanding of problem solving, and inference goes beyond routine problems to include unfamiliar problems, complex contexts, or multi-step problems (Mullis et al., 2009). From the above, it is obvious that both the field of application and inference focus on solving problems, and the percentage

like a social activity, in which individuals cooperate through an interactive and cooperative process to solve problems facing their environments. Through it, the function of reaching the goal is achieved, and the tools to reach this goal are improved, and then all the barriers and obstacles that prevent solving the problem are overcome. Individuals with problem-solving competence are more encouraged in dealing with others, have a more positive ego, and use more appropriate techniques to deal with complex social situations (Yalcın et al., 2010).

Therefore, Problem solving is a very precise and behavioral cognitive process involves finding effective ways to deal with the problems of daily life and interacting with others. It is the ability to consciously deals with the most complex social problems (Karabacak et al., 2015), and is closely related to individual's psychological adaptation and his self-confidence, his efficiency of communicative ability with others, his ability to take decisions, and his self-esteem in terms of academic and social aspects (Ozus et al., 2015). Hence, the learner must have the ability to solve problems toadapt and change the social life he lives (Kalaycı, 2001).

Social skills are defined as a set of skills that allow an individual to understand his peers and colleagues in the work situations, and to accomplish common tasks in terms of respect, appreciation, and good acceptance of others (Nasr & Hammad, 2013). Social skills are defined also as patterns of the learned behavior within the social interaction through suitable reactions according to the life situations, in which an and give him the opportunity to develop those skills through practicing and processing problems in an interactive context, and provide him with enough time to exercise.

It must also create strong awareness of how to transfer the acquired skills to both academic and real environments that require social interaction (Wismath et al., 2014).Wismath (2013) argues that when carrying out and practicing problem-solving skills, it should take place in a supportive, collaborative, and interactive learning environment that enhances social skills; In which the learner is deeply involved in solving the problem, and where a community of learners is formed to exchange new ideas and approaches about the problem.

Social skills are essential in learning environments for learners and educators; Where learning environments are characterized by continuous interaction between students and teachers, and between students each other's. One of the characteristics of effective teaching practices is to encourage collaboration between students and the teacher, as well as between the students and each other.All of that requires having the appropriate social skills. If the problem-solving skills are among the important skills of the twenty-first century, social skills are also important as they come to the third category of the twenty-first century skills, which are: profession and life skills, in the light of technological developments in communication techniques, which led to the openness of different cultures and societies to each other; Social skills are become more important (Terling& Fadel, 2013).Looking at problem solving, it is

The researchers were interested in studying the relationship between social skills and some variables: McClelland et al. (2000) found a strong positive, statistically significant correlation between social skills and achievement in reading and mathematics among primary school students, Diprete& Jennings (2012) concluded that social skills enhance learning processes, and the educational outcome from the learning process is high, Shattuck (2014) also found that social skills improve the general behavior of learners and the performance of scientific conversations and dialogues between them,Ahmadpanah et al., (2014) also found that enhancing the learners' social skills affects the acquisition of knowledge and deep understanding of the learning topics, problem solving, decision-making and constructing more creative solutions, andDomitrovich et al. (2017) indicated that there is a positive relationship between social skills and academic achievement.

The current research is concerned with determining the level of 5th grade primary school students' mathematical problem-solving skills and social skills and the relationship between them.

Research Problem:

The research questions are:

1. What is the level of 5th grade Students' mathematical problem-solving skills?
2. What is the levelof 5th Grade Students' social skills?
3. To what extent is there a statistically significant relationship between the learners' mathematical problem-solving skills and their social skills?

individual achieves his goals and is accepted by the environment (Ben Khalifa, 2016). Social skills are the skills that we need to coexist with others, or what is known as "coexisting or living together", understanding how to establish relationships with them, and having the ability to negotiatewith them about an issue or a set of solutions related to a problem (Nwankwo, 2015; Torres & Antonio, 2012). Therefore, it represents one of the objectives of the educational system at the present time, because it achieves the complete development of the personality. It is therefore important to view educational institutions as places to teach the learners to live together; it then gives them the needed social skills to contribute in achieving social and personal development (Torres & Antonio, 2012).

There are different classifications of social skills. Cooper &Farran, (1988) classify them into four fields: collaboration, self-regulation, responsibility, and independence, and Abdel-Fattah (2010) divides them into three areas: communication, responsibility, and leadership.

Students' mastery of social skills is important at all educational stages, especially in the lower stages, where the formation of social awareness begins, and in these stages, students also begin to have friends and avoid themselves from self-centeredness, and this can only be achieved through having social skills. Social skills in these stages help them to socially adapt, overcome their problems, satisfy their psychological needs, and deal in different life situations (Ben Khalifa, 2016).

acquiring a behavior that organizes the concepts and rules previously learned in a way that helps to apply them in the problematic situation facing the learner.It is a learnable skill that helps to find meaningful solutions, and the way of learner'srecognition of the problem situation he faces is the most important component of the problem-solving skill, and then learners should be provided with these skills (Karabacak et al., 2015).

From the above, it can be said that problem solving is the learner's active involvement in a new situation;its solution represents a difficulty for him.In order to reach the solution, the learner must retrieve his previous experiences related to the new situation and organize them in the light of his reflection and analysis of the new situation.

Problem solving is not only a reason or a goal for mathematics learning, but also a means of learning and teaching it. According to Rashid &Khashan (2009) problem solving is one of the important learning outcomes for mathematics teaching, because it is associated with thinking and its use in different areas of life, as students' use of mathematics to solve various problems in different areas of life contributes inachieving the previous goal. Abu Zina (2010) believes that the importance of mathematical problems solving lies in its work on: learning new mathematical knowledge and making it meaningful, as well as deepening students' understanding of previous knowledge, developing students' thinking patterns, transferring the effect of learning, and arousing students' motivation and curiosity.It is a way to train students on mathematical skills and develop their

4. How differentare themathematical problem-solving skills between learners with high social skills and learners with low social skills?

Literature Review:

Mathematical Problems Solving (MPS):

Problem solving is one of the most important features and functions of mathematics and cannot be separated from it. Problem solving isconsidered one of the most important reasons for mathematics origins and development. Mathematicshas originated since the ancient times to solve the problems that face the society. In the ancient Egyptian civilization, mathematics was developed for surveying agricultural land and knowing floods times. The Babylonians alsodeveloped a numerical system to be used in their commercial transactions (El-defaa, 2009).

According to the National Council of Mathematics Administrators in the United States of America, Problem solving is the basic competencies that elementary school students must be able to achieve, and it is considered a basic reason to learn mathematics (El-Meligy, 2005).

Ibrahim (2000) defined mathematical problem solving as a process in which an individual can use mathematical information he had previously acquired and related it to the new problem to reach a solution. The apparent proceduresdone by the learner when solving the problem refer to this process (Tolba, 2005). According to Abu Zina &Ababneh (2010) mathematical a problem solving is a process in which the learner uses his previous knowledge and experience to face an unfamiliar situation he is exposed to. Al-Azmi & Al-Adori (2014) define the problem-solving skill as the skill of

many of the problems he faces using one solution strategy; Because the solution strategy consists of general steps that the learner takes during the stages of problem solving, and therefore it is suitable for solving many different problems.

Polyaidentified four stages of problem solving: understanding the problem, planning for the solution, carrying out the solution plan, and reviewing the solution (Polya, 1965). Problem solving skills are distributed over the previous stages. Others viewed problem-solving skills from an operational perspective, as they were identifying four basic processes for solving the problem: Exploring and understanding the problem, representing and formulating the problem, planning and executing the solution, and monitoring and reflecting the solution with the necessity of Focus on the acquisition, use and production of information, These four problem-solving processes work together simultaneously; It provides the basis for teaching and developing learners' problem solving (Fischer et al., 2015; OECD, 2014). While Wismath et al., (2014) identified the most important problem-solving skills in the skill of understanding the problem, paying attention to the components of the problem, working backwards with the potential solution, analyzing the solution process, verbally and visually representing the problem, coding the steps of the solution mathematically, and identifying errors and learning from them.Other researchers have identified problem-solving skills in:identifying and selecting goals, producing alternative solutions, evaluating the solutions, making decisions, and implementing decisions (Ozus et al., 2015).

thinking skills. Sahtot& Jaafar (2014) add that problem solving increases students' ability to remember information, modifies their cognitive structure, increases their ability to take responsibility, and develops their scientific attitudes. Finally, through mathematical problems solving, learners acquire many ways of thinking can practice creative thinking, and they have social ability, self-confidence, and tolerance of ambiguity (Serin &Derin, 2008; Spence, 2003; NCTM. 2000).

Thus, problem solving is one of the main goals and reasons for teaching and learning mathematics, and at the same time it is a means to achieve many of the goals of teaching and learning mathematics, and problem solving is one of the features that characterize mathematics. Mathematics cannot be imagined without problems solving.

Mathematical Problem-Solving Skills and Their Development:

In order for the learner to solve the mathematical problem, he should have the knowledge associated with the problem, such as: concepts, laws and theories in which the problem cannot be solved without them, and until the learner reaches the correct solution, he must use these knowledge together according to a specific organization and sequence in the light of the problem he faces, which is called the solution method, it is more important than the solution itself (Bernardo, 1999).

Indeed, the solution method or strategy is more important than the solution itself, because the learner, during his study of mathematics, as well as in his life, faces many endless problems, but he can solve

the learner can solve the problem themselves notthe teacher, also, the teacher's assistance should be indirect, aiming to direct students' thinking towards the method of the solution, not to the solution, and should be general so that the students can then use it to solve the following problems.

Foran effective and motivated training of students' problems solving, it should depend on tasks that are appropriate for the students and related to their previous experiences, and these tasks should represent a challenge for the students and their solution requires higher cognitive processes. The role of the teacher is to follow-up and provides support, and to refer continuously to Polya's problem solving stages, when students solve the problems included in the tasks, the solution should go according to these stages. For example, in understanding the problem stage, the learner is directed to analyze the problem to its main elements by himself and then discusses these elements in a collaborative working group, as well as in planning for the solution stage, carrying out the solution plan stage, and reviewing the solution stage.

The role of the teacher during these stages is to guide and help the students to think of the solutions to reach the correct method and then apply it and make sure of the solution, one of the important things in training students to solve mathematical problems is to give them enough time to complete the tasks, this time should not be less or more than the required.Avoiding classroom problems such as the lack of tools and means and the lack of organizing the classroom environment is one of the important issues that the teacher must take

Ali (2015) indicated that problem-solving skills are classified into:

1- Understanding and analyzing the problem Skills, such as: reading the problem correctly, understanding the meanings and terms included in the problem, determining the information given in the problem, determining the goal of the problem, determining the needed information for the solution.
2- Planning to solve the problem skills, such as: choosing the appropriate arithmetic operations, translating the problem into a mathematical picture or symbolic equation that can be used, determining the steps of the problem.
3- Carrying outthe Solution skills such as: performing arithmetic operations, arranging the steps to solve the problem according to the goal, and writing the correct solution to the problem.
4- Evaluation and verifying the solution of the problem skills, such as: reviewing the steps to solve the problem, verifying the correctness of performing the arithmetic operations, writing the achieved solution, justifying the method of deducing the solution, and ssuggesting other solutions if possible.

According to Polya(1965)through training and imitation, students can be taught to solve problems, and the teacher has an important role in this, as the students cannot learn how to solve problems without the help of the teacher, and the assistance must be limited so that

verifying the solution. Thus, students' problem-solving skills can be measured by evaluating the various cognitive processes that the learner performs during these steps;it refers to his problem-solving skills, and this is done by evaluating students' problem-solving according to specific criteria to these cognitive processes (Jonassen, 2014).

According to Cholily et al. (2020) the assessment of the learners' mathematical problem-solving skills is doneby determining their thinking level in an organized and mathematical way, and it is better toevaluate learners through problems that required sequential steps in solving it.

According to Demitra, &Sarjoko (2018) measuring mathematical problem-solving skills is done by analyzing students' solutions to the problems using grade lists for mathematical problem-solving skills. For example, planning for a solution skill can be evaluated in the light of analyzing students' plans for the solution according to the following criteria: carrying out the plan leads to the correct solution, Here the learner gets a full degree, carrying out the plan will lead to an incomplete solution, the learner gets the half degree, and finally carrying out the plan will lead to a complete false solution, in this case the learner does not deserve any degree.

In the current research, a test for measuring students' problem-solving skills was developed, which includes productive questions to produce an answer, which is a problem, followed by four sub-questions related to mathematical problem-solving skills: understanding and analyzing the problem skill, plan for the solution skill, into account to ensure the effectiveness of the training on developing problem solving skills (Henningsen &Stein, 1997). Attia & Al-Waeli, (2018) showed thatthere is statistically significant correlation between the positive components of the classroom environment and problem-solving skills for children in the kindergarten stage.Rustanuarsi&Karyati, (2019) also showed the effectiveness of cooperative learning in developing eighth grade students' problem-solving skills, and this effectiveness increases when students are assigned with tasks that include unfamiliar problems which required higher cognitive processes to reach the solution.

From the above, it could be said thatdeveloping students' mathematical problem-solving skills requires givingthemassignments which include educational activities centered around the problems that require higher cognitive processes, and the teacher role is to guide and assist them during their work, and ensures that they follow the stages of problem solving, and emphasizing the importance of this, and to give them enough time to complete the activities, and to provide a motivated classroom environment for them.

MeasuringMathematical Problem

Solving Skills:

The problems encountered by the learner vary in terms of their structure and level of difficulty, but most of the different ways to solve problems include specific steps such as: defining and analyzing the problem, collecting information about it, suggesting possible solutions to it, reaching the appropriate solution, carryingout the solution, and finally

building these skills is affected by a number of factors that are divided into **internal factors** related to the individual such as emotional characteristics, and knowledge, and **external factors** such as: family, school, peers, and culture.Social skills are also defined as: "a set of acquired behaviors, whether intentionally through training programs and teaching strategies, or unintended through different daily life situations, and help to succeed in various social situations within the family, school or with friends (Abdel Halim et al., 2013).

From the mentioned above, social skills are the learned behaviors that appeared through individual social situations, enabling him to successfully interact and harmonizewith others

Learners' social skills include showing interest in others, initiating, and maintaining social interactions, participating in group play activities, responding appropriately to aggressive peer behavior, and effectively solving social problems (Jamison et al. 2012; Van Hecke et al. 2007). Caldarella & Merrell (1997) divided social skills into five dimensions: **friendship with peers**, which refers to interaction with peers and the making and keeping of friendships with peers, **self-management** that indicates self-control, following instructions and tolerance, **academic skills** that refer to follow the directions for tasks - performance,**Follow the instructions**, and**self-assertiveness**.

Farag (2003) divides social skills into: **self-assertivenessskill;** refers to expressing feelings and opinions, defending rights, and facing others' stress.**Emotional skills**:refers to empathy, and emotional participation, carrying out the solution skill, and verifying the solution skill. The students' answers were corrected according to grade lists for mathematical problem-solving skills that include specific criteria for their sub-skills.

Social Skills (SS):

Human life is based on social relations with others, as they cannot live alone without belonging to a group. Building social relations requires many social skills that enable an individual to interact and deal appropriately in various social situations.

Social skills include**cognitive components**, including ideas and knowledge that guide behavior in different social situations, which are difficult to be observed.**Behavioral components** or **skills**, that mean all behaviors that an individual shows according to previous knowledge when being in a social situation, and they are classified into verbal and non-verbal behaviors (Schneider, 2012; Cummings et al., 2008).

Social skills basically refer to interacting behaviors with others, including initiation and response during interaction (Merrell &Gimpel, 1998). Gresham & Elliot (1989) defined them as socially acceptable behaviors that enable a person to interact effectively with others and avoid socially unacceptable responses from others.

Gresham & Elliott (2008) defined social skills as the learned behaviors that support positive interaction and reduce negative interaction when applied it in social situations. Odom et al., (2008) considered social skills as the ability to successfully deal in social situations, and

others and to interact with others' feelings.**Collaboration skill:** refers to the ability to participate with others in different activities, help them and adapt to them.

The social skills that the learners need in school include two components: **interpersonal social skills** such as verbal and nonverbal individually or in groups communication with peers, and**social skills associated with the learning process** such as following instructions and responsibility(Missal &Hojnoski, 2008; McClelland & Morrison, 2003;Foulks& Morrow, 1989).

From the above, we find that there is a multiplicity of social skills classifications, and some of these classifications, such as Caldarella and Merrell division, has an overlap between the sub-dimensions of social skills, as in self-management dimension, the social skills dimension, and follow the instruction dimension. Allof them include behaviors about following instructions, and in the light of reviewing many studies, most of them were interested in developing the following sub-skills: collaboration, empathy, responsibility, following the instructions, communication, and leadership.

The learner's possession of social skills is very important; as it can be considered a means of adapting with his society (Daghestani, 2001). One of the objectives of education is to help the learner acquire the skills that will help him to do his future role in his society in a desirable way (Saadah& Ibrahim, 2011). Social skills come at the forefront of the skills that help the individual to do his role in society.

communication skills that refers to the ability to deliver information to others verbally or non-verbally, as well as attention Receiving, understanding, and applying verbal and nonverbal messages. **Discipline, social and emotional flexibility skills;**refer to the ability to control verbal and nonverbal behavior in social situations, and to modify it in order to achieve the desired goals. Denham et al. (2006) indicated that researchers identified five social skills that shape the learner's social behavior; they are: **collaboration**; meanshelping others, sharing, andfollow the instructions. **Assertion;**meansresponding to behaviors, asking for things, and responding to others'behaviors. **Responsibility**; meanscommunicating with adults and showing care and concern. **Empathy**; meansshowing concern about the feelings of others.**Self-control**: means the ability to respond appropriately to conflict or to corrective feedback from an expert.

Gresham & Elliott (2008) divide social skills into seven sub-skills: **communication, collaboration, self-assertiveness, responsibility, empathy, participation, and self-control.**

El-Khatib (2010) classifies social skills into five sub-skills: **Social communication skill**: refers to the ability to transfer ideas to others and interact with them through different means of communication. **Socialflairskill**refers to the competence in dealing with others in different social situations; toharmonize and adapt with others. **Dialogue skill:** refers to the ability to communicate effectively with others, convince them, defending their opinion and facing others. **Empathy skill:** refers to the ability to show feelings to

Finally, having social skills may be a reason for the quality of life, as Müller et al. (2014) found a positive relationship between social skills, social support and the quality of life, and found also a negative relationship between social skills and symptoms of depression, According to Smith (2018) showing high social skills by individual's participation in social situations makes them obtain high levels of social support, which increases the quality of their life and reduces the stress they suffer from. Buchs& Butera (2015) indicated that the growth of social skills enhances learner's motivation and the effectiveness of group workwhich concerns with cognitiveacademic outcomes, as well as motivating constructive interactions in problem-solving situations, which is a measurement of the quality of interactive work.

Thus, social skills are a prerequisite for the process of social adaptation, whether inside or outside the classroom and it is an essential means of teaching and learning in the light of contemporary educational trends. Also, students' possession of social skills limits behavioral problems inside and outside the classroom and increases the level of students' academic performance. It is also a basic factor for students' success in their future professional life.

Measuring social skills:

Through reviewing the studies related to social skills, it was found that social skills are measured by using behavior rating scales, interviews, reports, teacher or parent observation and situation tests. it is preferable to measure social skills directly by observing the behavior of individuals in social situations, which is

At the classroom level, social skills enable the learner to adapt and interact with peers, as well as enable him to learn in the light of contemporary educational trends that emphasize the importance of using learner-centered teaching strategies, and to give him the opportunity to participate and have a positive role through teaching and learning process.

Al-Baghdadi et. al. (2005) emphasizedthe importance of developing social skills among students in the lower educational stages, to prevent or reduce social problems in the future. If the students' behavioral problems are not addressed, they affect their adaptation to society in the future,so that their relationships are limited to individuals who have similar behavioral problems (Kiesner& Pastore 2005), The results ofWood (2009) showed that there is a negative relationship between behavioral problems and social skills, and the students who lack social skills had more behavioral problems than the students who have high social skills.Mastering social skills in early childhood has a long-term positive effect on social and academic skills in the next life stages (Wu et al., 2019; Odom et al., 2008; Caprara et al., 2000).

The results of many studies also showed the importance of social skills and their relationship to many of learning outcomes, including (Perdue et al., 2009), which showed a positive relationship between social skills, achievement, and participation in school activities. Social skills are also a prerequisite for professional competence, as many professions require the skill in dealing with others (Kagan & Kagan, 2009).

Instruments of the Research
Mathematical Problems Solving Skills (MPSS) Test

The test was constructed based on some studies in the field of mathematical problem solving in order to identify the level of mathematical problem solving skills: (understanding and defining the problem skill, planning for the solution skill, carrying out the solution skill, and verifying the solution skill) among fifth grade elementary school students. The test was prepared in its initial form in the light of the content of chapter twelve (perimeter, area, and volume)in the mathematics book for the fifth-grade primary school at the second semester. The test includes five questions, each question contains a problem, and the learner should solve the problem according to the following steps: identifying the data given and what is required, proposing a plan for the solution, carrying out the solution plan, and verifying the solution. Grade lists were prepared to mark the students' answers to the test questions.

To ensure the validity of the test, the initial form of the test and the grade lists for students' answers wereadministeredto six of the curricula and methods of teaching mathematics staff member to evaluate them.The test and the lists were modified according to their opinions.The test was applied to a pilot sample consists of (33) learners from the fifth-grade primary school

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one of the most Common methods of measuring social skills, but this requires a considerable time, effort, and cost. The situations testis easy-to-apply tools, commonly used to measure social skills in many studies, and can also be used to measure complex situations (Frey et al., 2011; Gresham et al., 2010; Christian et al., 2010).

The situations test can be defined as a tool for measuring procedural knowledge that guides the behavior of individuals in different situations. The test consists of a brief description of the situations that the individual faces and are related to the skills or behaviors,followed by alternatives that expressdifferent responses, the students should choose the suitable one of them (Motowidlo et al., 2006).

Methodology

This research concentrates basically on the learners as they are the main component in the teaching and learning process and studying the relationshipbetween mathematical problem solving skills and social skills. The research used correlative descriptive method to reveal the relation between two variables or more to identify the correlation between these variables, as well as using tests as tools to collect data

Research Sample:

The Research sample consisted of (58) 5thGrade Students from El-Damam, kingdom of Saudi Arabia.

The internal consistency of the test:Correlation coefficients were calculated between the scores of each mathematical problem solving skill and the total score of the test. Table (1) shows the results.

Table (1) Correlation coefficients between the scores of each mathematical problem-solving skill and the total score of the test

Skill	Correlation coefficient to the whole test
Understanding the problem	**0.603
Planning to solve the problem	**0.750
Carrying out the plan	**0.759
Verifying of the solution	**0.638

**significant at (0.01)

Depending on the results of the pilot sample, the coefficients of ease, difficulty, and discrimination were calculated for the test questions. The values of the coefficients of ease and difficulty ranged between 0.727 and 0.273, and the values of the discrimination coefficients ranged between 0.278 and 0.778. Also, the test reliability was calculating by using split- half method, which was 0.717.

Finally, the peripheral comparison validity (the discriminatory validity of the test) was calculated, where the scores of the pilot sample were arranged in a descending order, then a comparison between the highest 27% and the lowest 27% of the students in the scores, which number was 9students was made using Mann Whitney test (U). Table (2) shows the results:

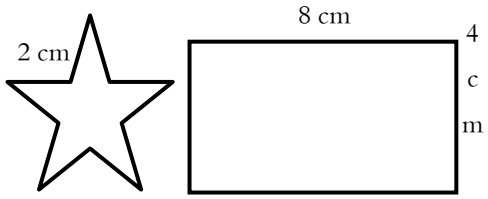
Table (2) Mathematics problem- solving Peripheral comparison validity

Variable	category(n=9)	Mean of ranks	Total ranks	U value	Z	Significance level
The whole test	High scores	14.00	126.00	0.000	3.625	0.01
	Low scores	5	45.00			
Understanding the problem Planning to solve the problem	High scores	13.22	119.00	7.000	2.995	0.01
	Low scores	5.78	52.00			
Carrying out the plan	High scores	13.33	120.00	6.000	3.096	0.01
	Low scores	5.67	51.00			
Understanding the problem Planning to solve the problem	High scores	13.50	121.50	4.500	3.195	0.01
	Low scores	5.50	49.50			
Carrying out the plan	High scores	13.67	123.00	3.000	3.369	0.01
	Low scores	5.33	48.00			

Table (2) shows that there are statistically significant differences at the significance level (0.01) between mean ranks of the low and the high scores on the mathematical problems solving as a whole and its skills: (understanding and defining the problem skill, planning the solution skill, carrying out the solution, verifying the solution skill). This shows the validity of the test to distinguish between the sample's performance levels.

The final form of the mathematical problem-solving skillstestaccording to the content of chapter twelve (perimeter, area and volume) in the mathematics book for the fifth grade primary school at the second semester consists of five problems, the learner should solve each problem according the following steps: identifying the data given and what is required, proposing a plan for the solution, carrying out the solution plan, and verifying the solution. The following is an example of the test question:

If the rectangle is designed using aluminum wire, can the wire used in designing this rectangle be used to design a star similar to this star?



The required
A): Determining the data and what is required in the previous question:
b): Suggest a plan to solve the problem:
c) Solve the problem according to the proposed plan:
d) Verify the solution:

Students' answers are corrected according to grade lists for mathematical problem-solving skills, for example f correcting no. (b) Planning for the solution skill, the proposed solution plan is corrected according to the following: If the proposed solution plan leads to a correct solution, the learner gets two marks, and if it leads to a partially correct solution, the learner receives one point, and if it leads to a completelyfalse solution, the learner does not receive any marks.

SituationsTest for Social Skills:

The test aims to measure the level of a number of social skills for fifth grade students, and the test was limited to the following skills: collaboration, empathy, responsibility, commitment to instructions, and leadership, as these are important skills for students' implementation of educational activities.

The test was prepared in its initial form by reviewing the educational literature related to social skills, and some scales and situations tests in social skills. The test included (20) multiple choice questions. Each question is a social situation that the learner may be exposed to during mathematics teaching and learning, followed by four alternatives that represent the possible behaviors to the situation, and the learner must select the appropriate alternative from his point of view.A correction key for the test wasprepared according to the social behaviors for each situation.

To ensure the validity of the test, the initial form of the test was administered to nine of staff members (six from curricula and methods of teaching mathematics departments, and three from psychology department). The test was modified according to their opinions.

The test was applied to a pilot sample consists of (33) learners from the fifth-grade primary school.

The internal consistency of the test:Correlation coefficients were calculated between the scores of each sub skill of the social skills and the total score of the test. Table (3) shows the results.

Table (3) Correlation coefficients between the scores of social skills and the total score for the situations test

Skill	Correlation coefficient to the whole test
Collaboration	**0.666
Empathy	**0.707
Leadership	**0.667
Responsibility	**0.632
Following the instructions	**0.572

**Significant at (0.01)

Depending on the results of the pilot sample, the reliability of the test was calculating by using split- half method, which was 0.696, and the validity of the peripheral comparison (the discriminatory validity of the test) was also calculated, where the scores of the pilot sample were arranged, a comparison between the highest 27% and the lowest 27% of the students in the scores, which number was 9 students was made using Mann Whitney test (U). Table (4) shows the results:

Table (4) the Validity of the peripheral comparison of the situations test for social skills

Variable	category(n=9)	Mean of ranks	Total ranks	U value	Z	Significance level
Whole test	High scores	14.00	126.00	0.000	3.388	0.01
	Low scores	5.00	45.00			
Collaborative	High scores	13.39	120.50	5.500	3.133	0.01
	Low scores	5.61	50.50			
Empathy	High scores	13.67	123.00	3.000	3.358	0.01
	Low scores	5.33	48.00			
Leadership	High scores	13.61	122.50	3.500	3.298	0.01
	Low scores	5.39	48.50			
Responsibility	High scores	13.06	117.50	8.500	2.851	0.01
	Low scores	5.94	53.50			
Following the instructions	High scores	13.39	120.50	5.500	3.123	0.01
	Low scores	5.61	50.50			

C- Point out the error loudly.
D- Wait until your colleague has finished and ask the teacher's permission to clarify the error.

Students' answers are corrected according to the social behavior chosen, where the learner gets three degrees when choosing the most sociablebehavior and gets two degrees if the behavior is socially medium, and one degree if the behavior is socially weak, and the learner does not get any degree if the chosen behavior reflects the lack of social skill.

The results of the research:

The level of learners' mathematical problem solving, or social skills is determined according to the percentage of the learner's total score or in one of the sub-skills. The level would be low if the learner's score on the test represented 33.33% of the total score of the test or less, the level would be medium if the score is greater than 33.33% and less than 66.67% of the total score, andthe level would be high if the score represents 66.67% or more of the total score.

1-Mathematical Problems Solving Skills (MPSS):

To answer the first question of the research, "What is the level of 5th Grade Students' mathematical problem-solving skills?" Means and standard deviations were used. Table (5) shows the results:

The final form of the test included (20) multiple choice questions. Each question is a social situation that the learner may be exposed to during mathematics teaching and learning, followed by four alternatives that represent the possible behaviors that represents one of the test skills (collaboration, empathy, leadership, responsibility, and following the instructions), and the learner must select the appropriate alternative from his point of view. The following are two examples of the test questions (the first is related to collaboration skill, and the second is relates to follow the instructions skill).

- A student from another class asked you to review with him his solution to some math homework exercises. You will:
  A- Revise the solution without clarifying the errors.
  B- Refuse him because he is not from your class.
  C- Review the solution with him and explain the errors.
  D- Review the solution with him, clarifying and correcting the errors.

- When a student offers to solve a problem and you discover an error in the solution, you will:
  A- Ask your colleague to stop and explain the error.
  B- Ask permission from the teacher to clarify the error.

Table (5) Means and Standard Deviations of the MPSS and its Subskills

Mathematical Problems Solving Skills (MPSS)	M	SD	Level	Rank
Understanding the problem	7.10	1.17	High	1

Planning to solve the problem	6.34	1.07	medium	2
Carrying out the plan	6.26	1.22	medium	3
Verifying the solution	5.48	1.33	medium	4
MPSS Total	25.19	2.58	medium	

- The low level of the learners' primary abilities in mathematics, as the study of Nurhayanti et al. (2020) indicates that fifth-grade learners with low primary abilities in mathematics cannot solve mathematical problems according to Polya's steps.

- The Low level of fifth-grade primary school learners' Mathematical Literacy Skills. Whereas Mathematical Literacy Skills are the basic skills for learning mathematics, but the fifth-grade primary school learners' is low (Adi Putra et al., 2021).
- The teachers' lack of interest in training the learners on mathematical problems solving according to Polya'sproblem solving steps: understanding the problem, plan for the solution, carrying out the solution, and verifying the solution. Marwati&Mas'ud (2021) indicated that teachers do not explain to learners how to solve mathematical problems according to the Polya's steps to solve the problem, and how these stages are integrated with each other.

The previous result can be explained in the light of:

- The learners' need to use higher-order thinking and inference skills when solving mathematical problems, and the learners' low

It is obvious from Table (5) that the learners' level of problem-solving skills in general was medium, as well as all sub-skills except understanding the problem skill whose level was high. The means of the level of mathematical problem-solving skills ranged between (5.48 - 7.10),the order of the skills was as the following : Understanding the problem (M=7.10; SD=1.17) ،Planning to solve the problem (M=6.34; SD= 1.07) ،Carrying out the plan (M=6.26; SD= 1.22) ،Verifying the solution (M=5.48; SD=1.33), the mean of the test as a wholeis (M=25.19), with standard deviation (SD=2.58).

This result is consistent with the studies that dealt with mathematics skills and mathematical problem solving skills, such as the study of Meutia et al. (2020) which found that the learners lack mathematical problem-solving skills, and Ernawati&Sutiarso (2020) found that the learners face difficulties during all steps of problem-solving and these difficulties are significant in verifying the solution step.

The previous result may be due to the following:

- The inability of the learners to understand written texts. Björn et al., (2016) indicated that the level of understanding the fourth-grade learners at the primary stage of written texts is a predictor of verbal mathematical problem solving skills.

(2020) indicated that teachers have difficulties related to problems solving, Fonseca (2021) indicated that the student teachers understand the processes and stages of problem solving through studying the courses of teacher's preparation program, but they deal spontaneously with the problems they face while teaching, Aprindi et al. (2020) showed that the majority of student teachers do not have the full ability to use the basic skills of mathematics in formulation, application, and interpretation during mathematical problems solving. Finally, Güner&Erbay (2021) showed that most student teachers have difficulties in using problem-solving strategies appropriately in solving non-routine problems.

The medium level of theresearch sample in mathematical problem-solving skills can be explained in the in light of the teachers' lack of dependence on the use of learner-centered teaching strategies such as the problem-based learning strategy. The use of the problem-based learning strategy, and the means prepared in the light of Problem-Based Learning increases learners' mathematical problem-solving skills (Jannah et al., 2021; Izzati, 2021; Siagian et al., 2021).

level of these skills does not enable them to solve mathematical problems correctly. According to Hiltrimartin et al. (2020) the low level of the learners in mathematical problems solving is due to their low thinking and inference skills. Syafitri, et al. (2020) indicated that the fifth-grade primary school learners' level of logical thinking in mathematics is very low. Ulfiana et al. (2019) found that the level of learners' critical thinking in mathematics is low. Abdullah et al. (2019) found that learners with higher-order thinking skills face difficulties during the stages of mathematical problems solving.

- Learners' anxiety about mathematics and their lack of interest, negatively affects their interest and performance in teaching and learning mathematics. As most learners do not like mathematics and consider it a difficult subject (Syafitri, et al., 2020; Setyaningrum, 2012). Rusyda et al. (2021) and Karasel et al. (2010) found that there is a negative relationship between learners' mathematics anxiety and their mathematical problem-solving skills.
- The lack of teachers' problem-solving skills. Hiltrimartin et al.

2- Social Skills (SS)

To answer the second question of the research "What is the level of 5th Grade Students' social skills", Means and standard deviations were used. Table (6) shows the results:

Table (6) Means and Standard Deviations of the SS

Social Skills (SS)	M	SD	Level	Rank
Collaboration	7.83	2.50	medium	1
Empathy	6.60	1.90	medium	5
Leadership	7.81	2.39	medium	2
Responsibility	6.91	2.24	medium	4
Following the instructions	7.67	2.64	medium	3
SS Total	36.83	9.35	medium	

inside the home compared to older learners in their teenage stage spend a large part of their time outside the home, which gives them an opportunity to interact with their peers compared to younger learners (Racz& McMahon 2011; Smetana 2008;Ingersoll 1989).

- The methods used by parents to discipline their children. Webster-Stratton & Hammond (1998) found that parents who use harsh polite techniques with their children have lower social skills. While Jeon &Neppl (2019) found that parents' use of discussion, persuasion, and interpretations techniques in disciplining their children increases social skills. Also, the parents' patterns in terms of their dealings with their children. The negative and authoritarian style of the parents negatively affects the development of social skills in the children compared to the positive pattern (Song et al., 2018; Roopnarine et al., 2006).

- The learners' medium level of social skills can be due to teachers' lack of interest in developing

It is obvious from Table (6) that the learners' level of SS in general was medium, as well as all sub-skills. The means of the level of SS ranged between (6.60- 7.83), the order of the skills level was as the following: :Collaboration (M= 7.83; SD=2.50); Leadership (M=7.81; SD=2.39); Follow the instructions (M=7.67; SD= 2.64); Responsibility (M=6.91; SD = 2.24); Empathy (M=6.60; SD=1.90); The mean of the test as a whole is (M=36.83); With standard deviation (SD = 9.35).

The previous result may be due to the following:

- The age of the fifth-grade learners, and the lack of their social skills. Berry & O'Connor (2010) found that social skills grow during the kindergarten to sixth grade with acceleration from kindergarten to first grade and from third to fifth grade and it slowdowns from fifth grade to sixth grade. The development of social skills in childhood is characterized by stability and slow change (Frogner et al., 2022).
- Learners at this age haven't enough experiences to form their social skills and spend most of their time

- The widespread use of digital tools in education at the primary stage. According to McNaughton et al (2021) the use of digital tools can provide opportunities to develop learners' social skills, but this requires special conditions.
- The cultural changes associated with the spread of electronic social networks that do not directly support social communication and enhance individual orientation and independence, which indicates that the prevailing culture in the society has a significant impact on the individuals' social skills (Wu et al., 2019).

3-The relationship between learners' mathematical problem-solving skills and their social skills:

To answer the third question of the research "To what extent is there a statistically significant relationship between the learners' mathematical problem-solving skills and their social skills?" Pearson's correlation coefficient was used between learners' scores in mathematical problem-solving skills test and their scores in the situations test of social skills. Table (7) shows the matrix of correlation coefficients between learners' skills in mathematical problems solving and their social skills

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learners' social skills, and Parents' communication with teachers about their children's social skills is one of the important factors in developing social skills, especially in the early educational stages (Iruka et al., 2011; Owen et al., 2000).

The previous result can be explained in the light of:

- Learners do not learn appropriate social skills; they need educational interventions in the field of social skills (Stichter et al., 2019). According to Kilgus et al. (2020) the learners' inability to have some social skills may be due to the fact that they have not learned these skills yet, or that they have learned them, but they do not practice them in an appropriate way for their age.
- Learners' social anxiety and their fear of dealing in different social situations. Learners from childhood to adolescence feel social anxiety in different social contexts, whether when dealing with individuals or groups, especially the unfamiliar to them (Glenn et al., 2019; De Los Reyes et al. 2013). Studies have found a negative relationship between social anxiety and skills Social.

Table (7) Pearson Correlation Coefficient between Students' Mathematical Problems Skillsand their Social Skills

Social Skills (SS)		Collaboration	Empathy	Leadership	Responsibility	Following the instructions	SS Total
S S	Understand	.169	-.005	.215	.064	.063	.132

	ing the problem						
	Planning to solve the problem	.016	-.035	.095	.086	.109	.073
	Carrying out the plan	.342**	.022	.425**	.104	.168	.277*
	Verifyingth e solution	.311*	-.006	.272*	.197	.271*	.275*
	MPSS Total	.405**	-.009	.478**	.215	.293*	.363**

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

decision-making (Ison, 2010). The processes of organization, sequencing, and decision-making are processes that are practiced within the social skills associated with leadership, following the instructions and responsibility, as well as by learners practice them inside the different social activities associated with solving social problems.

The statistically significant correlation can be attributed tothe study of Denham et al. (2006) which found that social skills lead to significant improvements in the learner's level of social interaction and enhance his ability to solve cognitive problems "such as mathematical problems solving", as well as enhance social inclusion and engagement in cooperative activities in a strong and extensive manner while solving these problems. This result indicates that social skills training is a valid entrance to enhance the primary schools learner's social integration and activate the learner's ability to solve problems.

This result confirms the perspective of Yalcın et al. (2010) that problem solving is a social activity in which individuals cooperate with each other to reach the desired goals, and through it they seek to

It is obvious from Table (7) that there is a positive, statistically significant relationship at the level (0.01) between fifth grade primary school learners' mathematical problem-solving skills and their social skills.

The positive correlation between mathematical problem-solving skills and social skills can be explained as the fact that mathematical problems solving requires interaction and communication from learners with each other and with the teacher, and mathematical problems solving is successful in cooperative learning environments. The results of Rustanuarsi&Karyati(2019) showed the effectiveness of cooperative learning in developing eighth-grade students' problem-solving skills and this effectiveness increases when students have tasks that include unfamiliar problems, and the solution requires higher cognitive processes.

This positive correlation can be due to the types of thinking that the learners use during solving mathematical problems, as they have two types of thinking when solving mathematical problems: structured, sequential, specific stepsthinking, and logical thinking based on inference and

on the situations test of social skills was calculated, and the learners were divided into two groups: the first group, the learners with high social skills (with a score greater than the median n = 29), and the second group, the learners with low social skills (with a score lower than the median n = 29). The differences between the scores of the two groups in the mathematical problem-solving skills test were calculated using the t-test for independent samples. Table (8) shows the results

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Table **(8) t -Test of High and Low Social Skills (SS) Groups**

Variable	Group	M	S. D	n	t (df)	P
Mathematical Problems Solving Skills (MPSS)	High-scoring group	26.03	2.60	29	2.62 (58)	0.00
	Low-scoring group	24.34	2.30	29		

(1990); Willis (2009)that in collaborative learning groups with mathematical tasks learners learn to build, generate, and test guesses together, and identify correct or incorrect solutions. They share in solving these tasks; and engage in discovery techniques to test each other's strategy.In their repeated attempts to carry out strategies they cancel the unproven strategy for the solution and try the other.

All these behaviors associated with solving a mathematical problem or task cannot be obtained withouthaving a set the required social skill for cooperative learning; in which the learner benefits from the different perspectives of classmates and from the banks "structures" of knowledge they have on the subject matter.

improve tools, methods and strategies to reach these goals, and to overcome all the barriers and obstacles that prevent solving the problem.

4- Differences in learners' mathematical problem-solving skills according to their social skills level:

To answer the fourth question, "How different are the mathematical problem-solving skills between learners with high social skills and learners with low social skills?" The median of the learners' scores

It is obvious from Table (8) that there are statistically significant differences between mean scores of learners with high social skills in the test of mathematical problem-solving skills and the mean scores of learners with low social skills favoring learners with high social skills.

The previous result can be explained in the light that learners with high social skills interact with each other effectively, during this interaction, cognitive structures cross between the learners,and exchange their experiences and skills more effectively than learners with low social skills. This leads to the expansion of learners' cognitive structures, experiences and skills compared to learners with low social experiences Thus, the impact of these expanded structures is reflected in their mathematical problems solving skills. This is confirmed by Jernigan &Tallal

Henricsson& Rydell (2004) and Hughes et al. (2001) indicated that learners with high social skills have a good relationship with teachers, and this relationship is one of the components of a good classroom environment that enhances their performance.

Also, the previous result can be explained in the light that the good classroom environment supports the learners'academic performance. The results of Attia & Al-Waeli(2018) showed a statistically significant correlation between the positive components of the classroom environment and problem-solving skills for children in the kindergarten stage.

Conclusions and recommendations

The study of the relationship between learners' mathematical problem-solving skills and social skills is importance to support the idea of theintegration between the different aspects of learning. The mathematical problem-solving is more effective in social contexts, and the learners' social skills have an important role during the stages of mathematical problem-solving, that's mean, the socialskills and the mathematical problem-solving skills are related and affect each other.

The results indicated that the level of the learners' mathematical problem-solving skills in general is medium, and this may be due to their mathematics anxiety, or the low level of initial abilities in mathematics and their low levels of inferential thinking. It may be also due to teaching problem solving without usingPolya's steps, or the suitable teaching strategies. The results indicated that the

The previous result can also be explained in the light that learners' possession of social skills is positively associated with learners' academic achievement, which is a prerequisite for solving mathematical problems, as a number of studies indicated that there is a positive correlation between social skills and academic achievement and each skill of them affects the other (Madrona. et al., 2014; Torres & Antonio, 2012; Diprete& Jennings, 2012; Perdue et al., 2009).

This result supports many studies that found the learners who have social skills and have a great social support in school, show a positive behavior in most learning situations, in addition to,the high intensity and frequency of positive behaviors in school life, such as respect for the teacher and peer interaction leads to positive learning. Positive relationships between learners and communication with each other and with teachers enhance the learning process and problem-solving skills (Torres & Antonio, 2012).

This result can be attributed to the fact that the learner with high social skills has a teacher who builds constructive feedback on solving the problem, seeks to consolidate and strengthen his cooperative skills, and helps in putting the learner in a different context that allows him to identify those skills and how to practice them in problem-solving situations. It also gives him the opportunity to model those skills in an organized manner until they become integrated into the learner's behavior to be routinely implemented during academic performance and solving mathematical problems (Buchs& Butera, 2015; Johnson & Johnson, 2009; Wood, 2009; Gillies, 2008; 2002).

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level of learners' social skills is medium, and this may be due to the characteristics of their age and their social anxiety, and it may be due to the parents' patterns in dealing with their children and the polite methods they use. Also, this may be due to teachers' lack of interest in developing learners' social skills and the lack of communication between teachers and parents regarding their children's social skills.

The results of the research revealed that there is a positive correlation between the learners' problem-solving skills and social skills and attributed this relationship to the learners' use of social skills during mathematical problems solving, as well as their practice of solving problems during social activities.Finally, the results found that there were statistically significant differences in mathematical problems solving between learners with high social skills and learners with low social skills favoring those with high social skills. This result was attributed to the large expansion of the cognitive structures of learners with high social skills because of their social interaction, and thus the impact of these expanded structures is reflected on their mathematical problems solving skills.

The research recommends the importance of developing social skills as a major factor that enhances learners' mathematical problems solving andusing the appropriate teaching strategies that activate learners' performance of social skills and mathematical problem-solving skills and studying the factors affecting the development of both social skills and mathematical problem-solving skills among learners.

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