

The Level of Problem-Solving Skill for Gifted and Ordinary School Students in Ajloun Governorate and Its Relationship to Some Variables and Academic Achievement

Dr. Faisal Issa Abdel Qader Nawasrah

Associate Professor, Department of Special Education, College of Arts and Educational Sciences, Ajloun National University, Jordan

Abstract

This study aimed to reveal the level of problem-solving skill and its dimensions of a sample of gifted and ordinary students in the schools of Ajloun City, Jordan and its relationship to some demographic variables (gender, grade, and educational level of parents) and academic achievement. In order to achieve the objectives of the study, the researcher used the problem-solving skill scale, depending on the theoretical framework of the foundations of counseling and psychological guidance, which was built by Hepner and Arabized by Hamdi (1998) and the researcher developed it to fit the Jordanian environment, and indications of the validity and stability of this scale were found, and the sample consisted of (291) from The students, who are (96) gifted students and (195) regular students, were randomly selected stratified from the primary and secondary grades, and the data were analyzed by finding the arithmetic averages and standard deviations and finding the value of (t) and the correlation coefficients. The study shows that the overall problem-solving skill level and its dimensions among ordinary and gifted students is average. There are statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the level of overall problem-solving skill and its dimensions between students (gifted and ordinary) according to the type of student in favor of the ordinary, and there are no statistically significant differences at the level of significance ($\alpha \leq 0.05$) in the degrees of the level of solving skill Overall problems and their dimensions among students (gifted and ordinary) depending on the class variable, It was also found that there are no statistically significant differences in the skill level of total problem solving and their dimensions among students (gifted and ordinary) according to the gender variable, and there were also statistically significant differences at the level ($\alpha \leq 0.05$) in the level of total problem solving skill and its dimensions among students. (Ordinary and gifted) depending on the father's educational level variable, and it was found that there are statistically significant differences in the level of skill of solving problems and their dimensions between ordinary and gifted students depending on the variable of the educational level of the mother except for the two dimensions of alternatives and the general orientation, and it was also found that there is no correlation between the level of skill of solving problems and their dimensions and academic achievement between the ordinary and gifted students. The results were also discussed in the light of the theoretical literature and previous studies, and some recommendations were suggested based on the results of the study.

Key words: problem-solving, gifted students, academic achievement, demographic variables.

Introduction

Today we live in an accelerated world that is controlled by information and communication technology and in which all aspects of economic, political, social and cultural life are complicated, which prompted educators and those in charge of education affairs to think about how to prepare the future generation so that they can face the challenges and determine the type of science that must be learned to be able to succeed in the future. Human energies are an important wealth, so it is imperative that society includes individuals who are able to achieve success, progress and the right choice of a future profession. Human societies at the present time seek to benefit from the capabilities and energies of their members, as they are a human wealth that must be used as a means to develop their extension and development needs not less than natural wealth, as they need to develop their capabilities.

Modern statistical ratios indicate that 2-5% of any society represent the talented, and they are the ones on who shoulder a responsibility in the society as they are their minds and conscious hearts (Al-Harran, 2005).

The importance of using the mind and investing it in smart ways that are characterized by change, speed and openness is evidenced by the crystallization of a type of behaviors, skills and habits. The problem-solving skill is based on the cognitive theory through its focus on the processes that take place inside the mind such as thinking, planning and decision-making rather than focusing on the external environment and the apparent responses. This skill provides an opportunity for creativity, expressing ideas, asking questions, producing knowledge, dealing properly and positively taking appropriate decisions (Al-Aitan, 2012).

Also, talented and gifted children develop mental and cognitive abilities at a much faster rate than their developmental, physical and emotional rates, so they are in urgent need of special care, as each individual adopts a solution that is commensurate with his/ her characteristics and capabilities, so there are a number of factors that affect the performance of problem-solving tasks, including tolerance, adoption correct thinking and a positive attitude towards others and society (Jarwan, 2015).

Therefore, this study came in order to identify the level of problem-solving skill and its dimensions of the ordinary and talented students of the teacher students in Ajloun Governorate and its relationship to some variables and academic achievement.

The study problem and its questions:

The problem of the study stems from the disparity in the results of the studies that dealt with the problem-solving skill of gifted and ordinary students from schools and universities and its relationship to some demographic variables and academic achievement, especially the study of (Al Adel and Abdel-Wahhab, 2003) and (Saygli, 2012). Therefore, the problem of this study is determined in revealing the level of problem-solving skill and its dimensions of gifted and ordinary school students in Ajloun governorate and its relationship to some demographic variables (gender, grade, and educational level of parents) and academic achievement.

Therefore, this study tried to answer the following questions:

1. Are there statistically significant differences at the level of ($\alpha \leq 0.05$) in the skill level and dimensions of problem-solving between gifted and ordinary students in Ajloun schools?
2. Are there statistically significant differences at the level of ($\alpha \leq 0.05$) in the level of problem-solving skill and its dimensions among gifted and ordinary students, according to the gender and grade variables?
3. Are there statistically significant differences at the level of ($\alpha \leq 0.05$) in the skill level and dimensions of problem solving among ordinary students according to the two variables of the educational level of the family (father, mother)?
4. Is there a correlation between the overall problem-solving skill level, its dimensions, and academic achievement?

Objectives of the study:

This study aims to reveal the overall problem-solving skill level and its dimensions for a sample of gifted and ordinary students and its relationship to some demographic variables (gender, grade, and educational level of parents) and academic achievement.

Objective boundaries of the study:

- This study is limited to study the overall problem-solving skill level and its dimensions for gifted and ordinary school students in Ajloun governorate and its relationship to some variables and academic achievement.
- The results of this study will be generalized with the psychometric evidence provided by the research tools, such as validity and reliability.
- The generalization of the results depends on the characteristics of the sample and the degree of its representation of the community from which it was drawn.

Study time limits:

The study sample was limited to a group of gifted students enrolled in King Abdullah Schools of Excellence, Ajloun and ordinary students (stratified random sample) from the Ajloun Education Directorate for the year 2020.

Spatial boundaries of the study:

This study was applied in the city of Ajloun, Jordan from gifted and ordinary students.

Significance of the study:

The importance of this study is evident in the detection and recognition of the level of problem-solving skill among the gifted and ordinary students of primary and secondary schools, which helps researchers to identify their abilities, capabilities, outlook for the future, the impact of the environment around them and the extent of their ability to plan for the future and take the appropriate decision, and the importance of studying variables demographic because it overlaps with the pattern of civilization, the pattern of the family and society as a whole, as the study of the age stage helps to know the extent of mental development and the individual's influence with the surrounding values in society.

The cultural level of the family and the type of activity practiced by parents affect the way their children think and their ability to face problems and make decisions.

Accordingly, the importance of theoretical study is evident in the following aspects:

- Attention to the talented is the goal of any society for the advancement and prosperity of its members.
- Standing on the level of problem-solving skill for students (gifted and ordinary) is part of the educational process and is of great importance for educators and counselors.

The study of individual differences between individuals in the level of problem solving is of great importance to direct and invest their capabilities, and this disparity appears in the social variables according to the difference of sex (males and females) and the classroom, which refers to the student's chronological age, and the social upbringing, including the difference in the cultural environment. (Father and mother educational level), social, values, habits and beliefs.

The importance of studying the differences in the skill level of overall problem-solving and its dimensions between gifted and ordinary students and its relationship to academic achievement appears to realize the size of the difference between these two categories and the extent to which this relates to academic achievement, as well as the practical importance of research in the following aspects:

- Clarify the importance of total problem-solving skill and its dimensions, given its close relationship to the individual's success in his social life and his professional future.
- This study provides a test to measure the skill of solving problems in general and their dimensions, with psychometric characteristics suitable for the Jordanian and Arab environment in general.

Therefore, this study came to find out the differences in the skill level of total problem-solving and its dimensions between gifted and ordinary people and its relationship to some variables (gender, grade, educational level of parents) and academic achievement in the upper and secondary stages.

Terminology of the study:

Defining problem-solving skill: It is an organized thinking process in which an individual uses his experiences and skills in order to perform an unfamiliar task, address a problem, or achieve a goal for which there is no ready solution (Jarwan, 2002).

Procedural definition: It is the score that the student obtains on the scale of problem-solving skills developed by (Hamdy, 1998).

Talent: is a biological concept that means a high level of intelligence that indicates an accelerated growth of brain functions and activities, and includes physical sensation, emotions, knowledge and intuition. (Clark, 1992)

Gifted:(the definition of the American Bureau of Education as stated in (Jarwan, 2015): Gifted Outstanding Children: They are those who give evidence of their ability to perform in high performance in the mental, creative, artistic, leadership, and academic fields, and who need services and activities that the school does not usually provide, in order to Full development of such preparations or correspondences.

The procedural definition of gifted child:the child who has been diagnosed as gifted by the Ministry of Education, and he studies in King's schools (his academic achievement is high, and he is subjected to a collective intelligence test).

Theoretical background:

The child's ability to think and solve problems is an educational goal that modern educational trends seek to provide the child with the ability to communicate effectively and solve his current and future problems in light of a world that is heading towards technology growth and multiculturalism.

The individual's adoption of a clear strategy that enables him to reach the correct solution to the problem depends on different factors, as the solution strategies differ according to the content and type of the problem, the content of the difficulty and the verbal instructions, and they also differ according to the individual's cognitive characteristics, and there is no clear strategy that is suitable for solving all problems, so psychologists consider The cognitive approach is to solve the problem as a skill that can be learned through the steps and stages of problem solving, and

the ability to learn a number of strategies that help reach a solution with the least effort and time possible (Al-Atoum, 2004).

The concept of problem solving:

It refers to the set of processes that the individual performs using the information and knowledge that he has previously learned, and the skills he acquired in overcoming a situation in a new and unfamiliar way for him in controlling it, and reaching a solution to it, so the method of problem solving is a method that puts the learner in a real situation His mind works in it with the aim of reaching a state of cognitive equilibrium, and the state of cognitive equilibrium is a state of motivation that learning seeks to achieve, and this state occurs when it reaches a solution, an answer or a discovery.

Types of problems

Reitman limited the types of problems to five, based on the clarity of the data and the goals.

- Problems where the data and objectives are clearly defined.
- Problems in which the data are clarified, and the goals are not clearly defined.
- Problems with specific and clear goals, and unclear data.
- Problems lacking clarity of objectives and data.
- Problems with a correct answer, but the necessary procedures to move from the status quo to the final status are unclear, and they are known as problems of foresight (Nabhan, 2008).

Specialists describe the method of problem solving in dealing with the topics and issues presented to individuals / students into two methods that may agree in some elements but differ in many of them, namely:

1. How to solve problems in the normal manner of agreement or modular (convergent)

The method of ordinary problem-solving is considered closer to the individual's method of thinking in a scientific way when confronted with a problem, and therefore it is known as: every

purposeful, flexible mental activity in which the individual acts regularly in an attempt to solve the problem.

2. Method for solving problems using an innovative or divergent method.

- You need a high degree of sensitivity for the student or whoever deals with the problem in defining it and determining its dimensions, and ordinary students / or individuals cannot perceive it, and this is what one of the researchers called sensitivity to problems.
- It also needs a high degree of relationship elicitation and extrapolation of dependencies, whether in formulating assumptions or arriving at the innovative product (Nabhan, 2008).

Steps to solve the problem:

The problem-solving activity is a cognitive mental activity that proceeds in arranged and organized cognitive steps in the mind of the student, whose elements and steps can be identified as follows:

- 1. Feeling the problem:** This step is the awareness of an obstacle or an obstacle that prevents the achievement of a specific goal.
- 2. Defining the problem:** It means accurately describing it, which allows us to draw its borders and what distinguishes it from others.
- 3. Analysis of the problem:** It is the individual's identification of the basic elements of a problem, and the exclusion of the elements that are not included in the problem.
- 4. Collecting data related to the problem:** It is represented in the extent to which the individual determines the best available sources for collecting information and data in the field related to the problem.
- 5. Proposing solutions:** It is represented in the student's ability to distinguish and define a number of proposed hypotheses to solve a problem.

6. Study the proposed solutions: the solution may be clear and familiar, then it will be approved, and there is a possibility of several possible alternatives, and the comparison between them is based on criteria that we define.

7. Creative solutions: Familiar solutions may not be available or they may be inappropriate to solve the problem. Therefore, it is necessary to think about a new solution that breaks out of the ordinary. To reach this solution, well-known creativity methodologies are practiced such as (brainstorming and combining elements (Abu Zina, 1997).

Cognitive characteristics of the gifted students:

(Lewis Porter, 2002) points out that children who achieve levels of mental development higher than their chronological age, they learn quickly and show advanced skills in reading, writing and using numbers and have a great ability to retrieve skills and information and have deeper knowledge than their peers (information in more than Subject) and they surround themselves early on with abstract concepts such as death, time, justice and freedom, and they have the ability to teach other children and enjoy imagination and creativity not only in their artistic products but in their ways of solving problems and they have a keen sense of humor due to their understanding of paradoxes and deficiencies in situations and events. They can also think logically and use skills beyond Knowledge early to manage their mental processes and they have a great level of internal control and they have a clear understanding of the cause-effect relationship, they also have a wide range of interests, they also respond to new stimuli and are bored with repetitive and routine activities (Al-Quraiti, 2013).

Previous studies

The researcher carried out a large number of studies in the field of problem-solving skill and its dimensions during the past decades. Here is a list to some of them:

(Warren, John, &Ellas, 1983) conducted a study aimed at comparing the skill of problem-solving in emotional and social aspects between the gifted and those with intermediate achievement in basic schools, the study sample consisted of (60) students of the sixth grade students with average achievement and (60) talented sixth graders, the results indicated that the high level of

cognitive development plays an important role in problem-solving skills, personal communication and interaction with others.

(Neihart, 1999) also conducted a study aimed at reviewing the most important research that she had carried out, which indicated that one of the features associated with talented people is the ability to solve problems as the pursuit of a goal that prevents it from achieving some obstacles, and the use of the strategy of removing obstacles and reaching the desired goal and making the decision regarding an important topic.

(Hughes, 2000) also conducted a study that aimed to find out the differences in the level of critical thinking of a sample of gifted and ordinary fifth grade students, learning difficulties, and the effect of a training program on the development of critical thinking. The results indicated that the level of critical thinking among gifted students was higher than that of ordinary students. The training program has a clear effect on increasing students' abilities to express their opinions and provide details.

In a study conducted by (Al-Adl and Abdel-Wahab, 2003) aimed at identifying the level of problem-solving and metacognition skills according to the level of mental excellence, the sample consisted of 236 students, 120 males and 116 females, the researcher used the academic achievement scale, problem-solving scale and metacognition skills. There are differences between the ordinary and the superior in favor of the superior, and between males and females in favor of males on the scale of problem-solving and planning.

In a study conducted by (Chan, 2005), it indicated that gifted male and female students tend to use adaptive strategies to solve problems and face pressures, and this reinforces the importance of using problem solving as an effective strategy for coping with problems.

In a study conducted by (Al-Enezi, 2006) aimed at identifying the level of problem-solving and critical thinking among a sample of outstanding students in Saudi Arabia, the results indicated that the level of critical thinking was high and there were no differences in the level of skills on the gender variable.

(Khalaf, 2007) also conducted a study aimed at evaluating the critical thinking of a sample of gifted students enrolled in the gifted, high-achieving and ordinary care programs in regular

schools in Jordan. The Cornell Critical Thinking Test was used. The results indicated that the level of critical thinking among the three groups was The average performance of highly-achieving students was higher than the average performance of gifted students enrolled in special programs for gifted care, while the average performance of gifted students was higher than the performance of ordinary gifted students.

(Al-Jaafra and Kharabsheh, 2008) conducted a study aimed at identifying the level of critical thinking among students of the tenth and first secondary grades in the Jubilee Schools for the Gifted in Jordan. The results indicated a low level of overall critical thinking and sub-skills of students according to the California test and the absence of statistical differences attributed to variables of gender and classroom.

In a study conducted by (Abu Zaytoun and Banat, 2010) which aimed to reveal the level of adaptation and the level of problem-solving skill of gifted students, and it also aimed to define the relationship between adaptation and their problem-solving skill. It also aimed to identify the differences between the group of talented people who are more adapted, and the group of high achievers who are less adapted in the skill of solving the problem. The study sample consisted of 99 gifted students enrolled in the pioneering position in Ain Al-Basha. The results indicated that the adaptation of gifted students was low. Adaptation on the emotional side was the highest in their adaptation dimensions, while the least was on the personal side. The results also indicated that the skill of generating alternatives was higher than the problem-solving skills of gifted students, while the skill of evaluating the proposed solutions was the least. The results also indicated that there was no statistically significant effect of the adaptation variable on all dimensions of problem-solving skill.

(Al Ziq, 2012) also conducted a study aimed at revealing the level of critical thinking among academically gifted students and ordinary students in the Faculty of Educational Sciences at the University of Jordan, and the researcher used the (Watts-Glaser) test for critical thinking, and the results indicated that only 10.95% of ordinary students have a degree High from critical thinking. 48.33% had a medium degree, 48.7% had a low grade, and 10.95% of the gifted students had a high grade. The results also indicated that gifted and talented students are superior to ordinary students in the skill of deduction, determining axioms, deduction and presenting arguments,

while there are no differences in interpretation skills. The results indicate that the level of critical thinking among gifted and ordinary students is low and below the expected level.

In a study conducted by (Al-Harabi and Al-Ashul, 2012) aimed at revealing the level of critical thinking among a sample of gifted students who are in the first, second and third secondary grades, the results indicated a low level of overall critical thinking and all sub-skills of students according to the (Watts-Glaser) test, and there are no statistically significant differences attributed to gender, with the exception of the skill of deduction in favor of males and the skill of knowing assumptions in favor of females, and there are no differences attributed to the variable of school grade.

In a study conducted by (Saygli, 2012) aimed at detecting the level of problem-solving among gifted students according to the variable of gender and grade, the sample consisted of (100) students from the students of the Enrichment Spring Semester in Science and Literature. The SPSS program to find statistical indications, the results indicated that there were no statistically significant differences in the level of problem-solving skill level on the gender and grade variable, as it was found that the level of problem-solving was average among gifted students in the enrichment center.

In a study conducted by (Evrar, 2016) aimed at determining the level of problem-solving skill in mathematical thinking among gifted students in the eighth grade at the Enrichment Arts and Sciences Center, the sample consisted of 6 students, four males and two females, using a qualitative research method based on Interviews, results indicated that gifted students use mathematical thinking skills and strategies in the field of social life and communication.

(Al-Hajjah and Abu Awwad, 2017) conducted a study aimed at identifying the level of critical thinking of gifted students and its relationship to their academic achievement in light of some variables. The sample consisted of (79) students from the tenth and eleventh grades of gifted students in King Abdullah School for Excellence, Zarqa where The California Critical Thinking Test was applied to them. The results indicated a low level of students in the overall critical thinking test and in all its dimensions (analysis, induction, conclusion, inference and evaluation). It was also revealed that there is no correlation between critical thinking and academic

achievement and there are statistically significant differences in the level of critical thinking to the variable of gender, which went for the benefit of females.

As for the study of Al-Momani (2017), which aimed to identify the impact of a problem-solving strategy on developing critical thinking skills among ninth grade students in the subject of history, the sample consisted of (60) students from the ninth grade basic in Ajloun Governorate, Jordan. The researcher prepared the study tool (achievement choice) that was applied before and after. The results indicated that there were no statistically significant differences between the mean scores of the experimental group and the control group students for the skill of assumptions and the skill of deduction, and it was found that there are statistically significant differences between the average scores of the experimental group students and the control group students for the skill of evaluation and the skill of deduction.

Commenting on previous studies

It is evident from previous studies that these studies examined the level of problem-solving skill and critical thinking and its relationship to some demographic variables, and these studies can be classified according to the type of sample into:

Studies that were drawn by school students, such as: Warren, John, &Ellas, (1983), Hughes, (2000), Al Adel and Abdel-Wahab (2003), Chan, 2005, Al-Anzi (2006), Khalaf (2007), and Al-Jaafra and Kharabsheh (2008), the study of Abu Zaytoun and Banat (2010), Al-Harabi and Al-Ashul (2012), Saygli, (2012), Evran, (2016), Hajjah and Abu Awwad(2017) and the study of Al-Momani (2017), and there are also studies of intercourse with university students Such as: the study of Al Ziq (2012).

Previous studies have also been classified into studies that used the quantitative and descriptive method in the research, such as: the study of (Warren, John, &Ellas, 1983), the study of (Hughes, 2000), the study of (Al-Adl and Abdel-Wahhab, 2003), the study of (Al-Anzi, 2006), the study of (Khalaf, 2007), the study (Al-Jaafara and Kharabsheh, 2008), (Abu Zaitoun and Banat, 2010), (Al-Harabi and Al-Ashoul, 2012), (Saygli, 2012), (Al-Hajjah and Abu Awad, 2017) and (Al-Momani, 2017), and studies that used the experimental quantitative method in research such as: the study of (Hughes study, 2000) and (Momani study, 2017), and studies that

used the qualitative research method such as: the study of (Neihart, 1999) and the study (Evrans, 2016).

Therefore, the current study came to find out the overall problem-solving skill level and its dimensions of gifted and ordinary students and its relationship to some demographic factors, gender (males, females), and grade (seventh, first secondary) and the educational level of parents (father, mother) between gifted and ordinary students, and studying the relationship between the level of skill Total problem solving and their dimensions and academic achievement of gifted and ordinary students, noting that the study sample is from secondary and basic high school students in Ajloun Governorate / Jordan.

Study population and sample:

The study population includes all gifted and ordinary students in the Ajloun Education Directorate, Jordan for the year (2019/2020). The study sample, which consisted of (291) male and female students, was selected distributed into two samples, and they were randomly selected, the first is the gifted sample, which was consisting of (96) male and female students from grades seven, nine and first secondary from King Abdullah School for Excellence, Ajloun, and the other sample is for ordinary students, which was chosen in a stratified random manner, consisting of (195) students from the seventh and first secondary grades, and from several Regular schools from the Ajloun Education Directorate, Jordan, as shown in Table (1).

Table (1): The number of students (members of the sample) according to the variables of the study

Variable	categories	Repetition	percentage
Student type	Ordinary	195	67.0
	Gifted	96	33.0
Gender	Male	150	51.5
	Female	141	48.5
Classroom	Seventh	173	59.5
	First secondary	118	40.5
Father's educational level	Second Secondary and below	173	59.5
	University degree	118	40.5
Mother's educational level	Second Secondary and below	128	44.0
	University degree	163	56.0
Total		291	100.0

It is evident from Table (1) that the total number of gifted and ordinary students is (291) male and female students, of whom (150) are males and (141) females, and they are distributed according to grade, (173) students from the seventh grade, and (118) students from the first grade of secondary school. It is also evident that the total number of ordinary students is (195) male and female students and (95) gifted male and female students. They are also distributed according to the educational level of the father, (173) students whose parents with second secondary level for a year or less, and (118) students whose parents are with a university degree. They are also distributed according to the educational level of the mother, (128) students whose mothers are from a second secondary level and below, and (163) students whose mothers have a university degree.

Study tool (problem-solving skill scale)

In this study the researcher used the problem-solving scale, depending on the theoretical framework of the foundations of psychological counseling and guidance, which was built by Hepner and Arabized by Hamdi (1998), and the researcher developed it to suit the Jordanian environment and for the purposes of the current study, and it measures the level of overall problem-solving skill and its dimensions. Each item of the scale is according to Likert's five-point scale, which is (always, often, sometimes, rarely, very rarely) graded from (1-5), where the

overall score of (5) and the degree higher than (3.1) is high , between (2.5 - 3.1) is medium, and less than (2.5) is low. The overall score was found out of (5), and the scale consists of five dimensions, which are:

The first dimension: the general approach to the problem (8) items, which are (1,6,11,16,21,26,31,36).

The second dimension: Defining the problem (8) items, which are (2,7,12,17,22,27,32,37).

The third dimension: Generating possible alternatives to the solution (8) items, which are (3,8,13,18,23,28,33,38).

The fourth dimension: Decision-making (8) items, which are (4,9,14,19,24,29,34,39).

The Fifth Dimension: Evaluation of Results (8) items, which are (5,10,15,20,25,30,35,40).

Credibility and reliability of scale:

The researcher verified the validity of the scale by:

The arbitrators' validation: The scale was presented in its final form to six arbitrators who hold a doctorate in counseling and special education, measurement and evaluation at Ajloun National University and Yarmouk University, in order to verify the suitability of the scale to achieve the purposes of the study, the original scale consisted of (40) items, (2) items were modified (8,12,17,26,32,37), based on the arbitrators' observations, and in line with the Jordanian environment.

The credibility of the construction of the tool was also verified by calculating the correlation coefficient between the dimension and the overall score of the scale, as shown in Table (2).

Table (2): Pearson correlation coefficient between dimensions and the overall score of the scale of problem-solving skill

Dimension	General orientation	Definition of problem	Generating alternatives	Decision making	Evaluation
General orientation					
Define the problem	.523(**)				
Generating alternatives	.621(**)	.751(**)			
Make decision	.546(**)	.548(**)	.801(**)		
Evaluation	.758(**)	.631(**)	.814(**)	.687(**)	
Problem Solving	.625(**)	.641(**)	.833(**)	.725(**)	.711(**)

** a statistically significant function at the level of significance ($\alpha = 01$)

The values of the Pearson correlation coefficient for the dimensions mentioned in Table (3) have been limited between (0.523 - 0.833), and they are all statistically significant at the level of significance ($\alpha < 0.01$), as shown in Table (3) the extent of the correlation between performance on dimension and performance on the other dimensions are in the same scale, as it shows the extent of the correlation between each dimension and performance to a measure of overall problem-solving skill, and it turns out that all these values are statistically significant at a significance level ($\alpha < 0.01$), which confirms that the scale tool has a high degree of relevance (Since the overall test is the criterion).

Validity of the scale:

The reliability coefficient was also calculated for the problem-solving scale and its dimensions by applying it to the exploratory sample (32 male and female students), then re-applying it two weeks later to the same group, then computing the Pearson correlation coefficient, and the validity coefficient was also found by the half-segmentation method (odd, even). The validity coefficients for the different dimensions were extracted by calculating the Pearson correlation coefficient between the first and second applications. Table (3) shows the validity coefficients for the problem-solving scale and its dimensions by the repetition method and the internal consistency method.

Table (3)

Validity coefficients for the dimensions of the problem-solving skill scale by the repetition method and the internal consistency method

Dimension	Validity of repetition	Validity of internal consistency
General orientation	0,61	0,74
Define the problem	0,75	0,65
Generating alternatives	0,71	0,74
Make decision	0,78	0,70
Evaluation	0,73	0,77
Problem Solving	0,81	0,82

The coefficients of stability in the repetition method ranged between (0.61 - 0.78) between exclusion and (0.81) on the validity coefficient to restore the skill level of total problem solving. These parameters are acceptable for the purposes of the current study.

The internal consistency coefficient for the same sample was calculated using the Cronbach alpha coefficient, and the validity coefficients ranged between (0,65 - 0.77) between the dimensions and (0,82) on the reliability coefficient for the level of overall problem-solving skill and these coefficients are acceptable for the purposes of this study.

Study variables

The study included the following variables:

- The independent variable: gender, grade, the educational level of parents (second secondary and below, university), academic achievement.
- The dependent variable: the skill level of total problem solving and its dimensions.

Statistical treatment

Data was prepared and statistically analyzed using SPSS software, in order to:

- Calculation of the credibility coefficient for the overall study scale by re-application, by the half-segmentation method, using the Pearson correlation coefficient.

- The arithmetic means and standard deviations of the performance scores were calculated on the scale of coping with the total stress.
- T.Test was also used to find out the level of statistical significance for the differences between the arithmetic means according to the variables of gender, grade and educational level of the parents.

The academic achievement level was obtained from the school transcript, represented by the student's score in the class in which he is studying in the 2019/2020 academic year.

- The correlation coefficient between the performance of the sample (gifted and ordinary) was also found on the scale of the overall problem-solving skill and its dimensions and the general class academic achievement represented by the average student in the class of studying.

Study results and discussion

Results related to the first question:

The first question in the study states: (Are there statistically significant differences at the level of ($\alpha \leq 0.05$) in the skill level and dimensions of overall problem solving between gifted and ordinary students in Ajloun schools?).

To answer this question, the arithmetic means and standard deviations on the professional maturity scale and its dimensions were found as in Table (4,5).

Table (4): the arithmetic mean and the standard deviation on the scale of the over all problem-solving skill and its dimensions

Dimension	arithmetic mean	standard deviation
General orientation	3.10	.602
Define the	3.25	.572

problem		
Generating alternatives	3.24	.557
Make decision	3.18	.608
Evaluation	3.13	.554
Problem Solving	3.18	.439

It is evident from Table (4) that the arithmetic mean of the scores for the overall problem-solving skill scale and its dimensions among the sample members (ordinary and gifted students) ranged between (3.10-3.25), which are the mean values, given that the mark (3.00) is the cut-off score.

The results of this study are consistent with the study (Saygli, 2012), which indicated an average level of overall problem-solving skill and its dimensions among school students, while the results of this study are not in agreement with (Al-Anzi study, 2005), (Khalaf, 2007), (Al-Jaafarah and Kharabsheh, 2008) and (Al-Ziqq, 2012).

A level of overall problem-solving skill and its dimensions was found for the study groups (gifted and ordinary) as shown in Table (5).

Table (5): A level of overall problem-solving skill and its dimensions for the study groups

Dimensions	Type pf students	No.	arithmetic mean	standard deviation	Value of T	Freedom levels	Statistical significance
General orientation	Ordinary	195	3.18	.647	3.481	289	.001
	Gifted	96	2.93	.455			
Define the problem	Ordinary	195	3.34	.578	4.214	289	.000
	Gifted	96	3.05	.508			
Generating alternatives	Ordinary	195	3.33	.587	3.950	289	.000
	Gifted	96	3.06	.441			
Decision-making	Ordinary	195	3.28	.644	3.843	289	.000
	Gifted	96	2.99	.477			
Evaluation	Ordinary	195	3.22	.589	3.911	289	.000
	Gifted	96	2.96	.423			
Problem-solving	Ordinary	195	3.27	.461	5.208	289	.000
	Gifted	96	3.00	.320			

Table (5) shows that there are statistically significant differences in the skill level of total problem solving and their dimensions between gifted and ordinary students in favor of ordinary students. While they have a low level of interpretation skills, the results of the study (Warren, John, &Ellas, 1983) indicated the importance of the high level of cognitive development in

solving problems, personal communication and interaction with others, while the results of the study of (Abu Zaitoun and Banat, 2010) indicated the high level among gifted students in generating alternatives and their low level after evaluating the proposed solutions, and the results of this study are not in agreement with the study of (Al-Adl and Abdel-Wahhab, 2003), which indicated the superiority of the gifted in the level of total problem solving and after planning, and the results of the current study can be explained that the study sample of the gifted are overburdened in the enrichment programs and performance tests, which reduced the level of their performance on the overall problem-solving skill test and its dimensions.

Results and discussion related to the second question:

The second question in the study states: (Are there statistically significant differences at the level of ($\alpha \leq 0.05$) in the skill level and dimensions of total problem-solving among gifted and ordinary students, depending on the gender and grade variables?).

To answer this question, the overall problem-solving skill level and its dimensions were calculated on the male and female gender variable, as shown in Table (6).

Table (6): A level of total problem-solving skill and its total relevance to the gender variable

Dimension	Gender	No.	Arithmetic mean	Standard deviation	Value of T	Freedom levels	Statistical significance
General orientation	Male	150	3.07	.587	-.928	289	.354
	Female	141	3.13	.617			
Define the problem	Male	150	3.22	.577	-.882	289	.378
	Female	141	3.28	.566			

Generating alternatives	Male	150	3.21	.532	-.900	289	.369
	Female	141	3.27	.583			
Making decisions	Male	150	3.15	.645	-.985	289	.326
	Female	141	3.22	.566			
evaluation	Male	150	3.10	.506	-.962	289	.337
	Female	141	3.17	.600			
Problem-solving	Male	150	3.15	.419	-1.230	289	.220
	Female	141	3.21	.458			

It is clear from Table (6) that the level of total problem-solving skill and its dimensions for males (3.07-3.22) and among females ranges between (3.13-3.28), and it was also found that there are no statistically significant differences in the level of ($\alpha \leq 0.05$) in the level of problem-solving skill. The overall study and its dimensions on the gender variable among the sample students in general (gifted, ordinary), and the result of this study is consistent with the study of (Al-Anzi, 2006), the study of (Al-Harabi and Al-Ashul, 2012) and the study of (Al-Hajjah and Abu Awwad, 2017), while the results of this study do not agree with the study of (Al-Adl and Abdul-Wahhab, 2003) which indicated that there are differences in the level of problem-solving and metacognitive skills on the gender variable in favor of males, and the results of this study are not in agreement with the study of (al-Hajjah and Abu Awwad, 2017), which indicated that there are differences in the level of critical thinking and facing problems on the variable of gender in favor of females.

The results of this study can be explained to the fact that the sample members, whether male or female, use the skill of solving problems and their dimensions are represented in the dimension of general orientation, defining the problem, generating alternatives, decision-making, and evaluation in a moderate manner due to the similarity of patterns of family upbringing and ways of thinking they have.

The skill level of total problem solving was calculated and its dimensions on the variable (seventh, first secondary), as in Table (7).

Table (7): Total problem-solving skill level and its dimensions on the variable of classroom.

Dimension	Class	No.	Arithmetic mean	Standard deviation	Value of T	Statistical significance
General orientation	Seventh	173	3.08	.612	-.756	.450
	First	118	3.13	.587		

	secondary					
Define the problem	Seventh	173	3.28	.574	1.280	.202
	First secondary	118	3.20	.567		
Generating alternatives	Seventh	173	3.24	.585	-.072	.942
	First secondary	118	3.24	.515		
Making decisions	Seventh	173	3.15	.645	-1.159	.247
	First secondary	118	3.23	.548		
evaluation	Seventh	173	3.11	.573	-1.022	.308
	First secondary	118	3.17	.524		
Problem-solving	Seventh	173	3.17	.453	-.472	.637
	First secondary	118	3.20	.418		

It is evident from Table (7) that the level of total problem-solving skill and its dimensions among seventh-grade students ranged between (3.08-3.28) and first secondary students were (3.13-3.24), and it is evident that there are no statistically significant differences at the level of ($\alpha \leq 0.05$) in terms of the skill level of overall problem-solving and its dimensions on the grade variable between gifted and ordinary students, the result of this study is consistent with the study of (Al-Jaafara and Kharabsheh, 2008) the study of (El-Harabi and Al-Ashol, 2012) and the study of (Saygli, 2012) while the researcher did not find any study contradicts with that, and the result of this study can be explained by the fact that the study sample of gifted and ordinary students live in a very similar environment and they are brought up in similar patterns of family and school upbringing, which reduces the differences between them in the level of problem-solving skill and its dimensions, where gifted and ordinary students use methods of problems-solving regardless of grade level.

Results and discussion related to the third question:

The third question in the study states: (Are there statistically significant differences at the level of ($\alpha \leq 0.05$) in the skill level and dimensions of total problem solving among ordinary and gifted students according to the two variables of the educational level of the family (father, mother)?).

To answer this question, the total problem-solving skill level and its dimensions were calculated on the father's educational level variable (second secondary or less, university) as in Table (8).

Table (8): Total problem-solving skill level and its dimensions for (gifted ordinary) students on the education level variable of the father.

Dimension	Father's educational level	No.	Arithmetic mean	Standard deviation	Value of T	Statistical significance
General orientation	Second secondary and below	128	3.19	.653	2.286	.023
	University	163	3.03	.549		
Define the problem	Second secondary and below	128	3.34	.553	2.400	.017
	University	163	3.18	.578		
Generating alternatives	Second secondary and below	128	3.31	.605	1.846	.050
	University	163	3.19	.511		
Making decisions	Second secondary and below	128	3.31	.633	3.307	.001
	University	163	3.08	.569		
evaluation	Second secondary and below	128	3.25	.587	3.174	.002
	University	163	3.04	.510		
Total problem solving	Second secondary and below	128	3.28	.471	3.464	.001
	University	163	3.10	.396		

It is clear from Table (8) that there are statistically significant differences at the level of ($\alpha \leq 0.05$) in the skill level of total problem solving and its dimensions on the educational level variable of the father between ordinary and gifted students and in favor of second secondary level and below, and the researcher did not find, according to his knowledge, any study that concurs with this study.

The results of this study can be explained by the fact that parents, whether their educational level in secondary level or below, seek to teach their children the basic elements and dimensions of problem-solving skills and their dimensions represented in the dimension of problem definition, decision-making and evaluation, and the methods and patterns of family upbringing that parents generally use.

Also, the skill level of total problem solving and its dimensions were calculated on the variable of the mother's educational level (second secondary or less, university) as in Table (9).

Table (9): The level of problem-solving skill and its dimensions for (gifted and ordinary) students on the mother's educational level variable.

Dimension	Second secondary and below	No.	Arithmetic mean	Standard deviation	Value of T	Statistical significance
General orientation	University	173	3.14	.615	1.278	.202
	University	118	3.05	.579		
Define the problem	Second secondary and below	173	3.30	.561	2.020	.044
	University	118	3.17	.580		
Generating alternatives	Second secondary and below	173	3.25	.562	.356	.722
	University	118	3.23	.552		
Making decisions	Second secondary and below	173	3.24	.603	1.759	.080

	University	118	3.11	.610		
evaluation	Second secondary and below	173	3.20	.567	2.589	.010
	University	118	3.03	.519		
Total problem solving	Second secondary and below	173	3.23	.443	2.111	.036
	University	118	3.12	.426		

It is clear from Table (9) that there are statistically significant differences at the level of ($\alpha \leq 0.05$) in the skill level of total problem solving and its dimensions on the educational level variable of the mother between the ordinary and gifted students in favor of second secondary level and below except for the two dimensions of alternatives generation and general orientation. The researcher, to the best of his knowledge, didn't find any study that agrees or does not agree with this study.

The results of this study can be explained by the fact that mothers, whether their educational level are university or second secondary or less, seek to teach their children the basic elements and dimensions of problem-solving skills and their dimensions represented in the dimension of general orientation, defining the problem, generating alternatives, decision-making and evaluation, and the methods are similar as well as the patterns of family upbringing that parents of the sample members use in general.

Results and discussion related to the fourth question:

The fourth question in the study states: (Is there a correlation between the level of problem-solving skill and its dimensions and academic achievement between gifted and ordinary students?)

To answer this question, the Pearson correlation coefficient was used for the relationship between the level of professional maturity and its dimensions and academic achievement among ordinary students, as shown in Table (10).

Table (10): Pearson's correlation coefficient for the relationship between the skill level of overall problem-solving and its dimensions and academic achievement of ordinary students

Dimension	User statistic	Average
General orientation	Correlation coefficient	.031
	Statistical	.670

	significance	
Define the problem	Correlation coefficient	.041
	Statistical significance	.574
Generating alternatives	Correlation coefficient	.036
	Statistical significance	.612
Making decision	Correlation coefficient	.013
	Statistical significance	.858
evaluation	Correlation coefficient	.124
	Statistical significance	.085
Problem-solving	Correlation coefficient	.056
	Statistical significance	.436

It is clear from Table (10) that there is no correlation between the skill level of overall problem-solving and its dimensions and academic achievement among ordinary students.

Pearson correlation coefficient was also used for the relationship between overall problem-solving skill and its dimensions and academic achievement among gifted students, as shown in Table (11).

Table (11): Pearson correlation coefficient for the relationship between the skill level of overall problem-solving and its dimensions and academic achievement of gifted students.

Dimension	User statistic	Average
General orientation	Correlation coefficient	.042
	Statistical significance	.684
Define the problem	Correlation coefficient	.027
	Statistical significance	.793
Generating alternatives	Correlation coefficient	.138
	Statistical	.180

	significance	
Making decision	Correlation coefficient	.017
	Statistical significance	.867
evaluation	Correlation coefficient	.147
	Statistical significance	.153
Problem-solving	Correlation coefficient	.051
	Statistical significance	.620

It is clear from Table (11) that there is no correlation between the skill level of overall problem-solving and its dimensions and academic achievement among gifted students.

Therefore, it is evident from Table (11,10) that there is no statistically significant correlation at the level of significance ($\alpha \leq 0.05$) in the level of overall problem-solving skill and its dimensions and academic achievement between the ordinary and the gifted, and the researcher did not find, according to his knowledge, any study that is consistent or inconsistent with this study except the study of (Al-Hajjah and Abu Awwad, 2017), which indicated that there is no correlation between critical thinking and academic achievement among gifted students, and the study of (Warren, John, &Ellas, 1983) which indicated that the high level of cognitive development plays a role in solving problems and personal communication and interaction with others.

The results of this study can be explained by the methods that children use in academic achievement, such as: taking responsibility, identifying the problem and logical analysis, generating alternatives, positive re-evaluation of the situation, and making appropriate decisions that generally help students (ordinary and gifted) in academic achievement.

Recommendations

In light of the research results, the researcher recommends:

- The necessity of building programs to develop problem-solving skills (methods of facing problems and making decisions) for ordinary and gifted students.

- The necessity of taking into account individual differences among students due to the different methods of family upbringing and the influence of demographic factors on the level of problem-solving skill and their dimensions among students.

Suggestions:

In light of the research results, the researcher suggests the following:

- The need to conduct more studies on problem-solving skill and its dimensions among other groups of people with special needs.
- Conducting a study on the relationship of problem-solving skills and their dimensions to the patterns of family upbringing and self-concept.

References

- **Abu Zina,F.(1997). Mathematics, Curricula and Principles of Teaching it**, Dar Al-Furqan, Amman, 4th Edition.
- **Jarwan, F.(2015).Talent and excellence**, (6 ed.) Amman: Dar Al-Fikr, publishers and distributors.
- **Al-Jaafara,A & Kharabsheh,A.(2008). The degree to which high achievers at Jordan Jubilee School possess the skills of critical thinking. The Letter of the Arabian Gulf Journal** (112), pp. 1-75.
- **Al-Hajjah,& Abu Awwad, F.(2017). The level of critical thinking among gifted students and its relationship to academic achievement among outstanding students at King Abdullah II School of Excellence in Zarqa City, Journal of Educational Sciences Studies**, Volume 44, Issue 4, Supplement 63.
- **Al-Haddabi,D&Al-Ashwal, A. (2012). The extent of availability of some critical thinking skills among gifted students in the secondary stage in the cities of Sana'a and Taiz. The Arab Journal of Development and Excellence. 3 (5) 16-26.**
- **Hamdi,N.(1998).The relationship of problem-solving skills to depression among students of the University of Jordan, Journal of Volumes Studies. (25) Issue (1).**
- **Khalaf, R. (2007): Evaluation of critical thinking among a sample of gifted students enrolled in special programs, and high-achieving and ordinary students in regular**

schools. A comparative study in the Hashemite Kingdom of Jordan, PhD thesis / Amman Arab University for Postgraduate Studies / Amman, Jordan.

- **Al Ziq, A.** (2012). The level of critical thinking among academically gifted students and ordinary students and the extent of the differences between them in the basic skills of critical thinking, **Journal of Educational and Psychological Sciences**, University of Bahrain, 6 (2), pp. 90-116.
- **Al-Atoum,A.**(2004). Cognitive psychology theory and practice. First floor, Dar Al-Masirah Amman / Jordan.
- **Al-Adl,A&Abdel-Wahhab,S.**(2003).The ability to solve problems and metacognitive skills for the ordinary and the mentally superior, **Journal of the College of Education (Education and Psychology)**, No. 27, Part Three, pp. 181-258.
- **Al-Anzi,M.**(2006).**Critical thinking and social responsibility for gifted students in schools in the Al-Hawf and Northern Borders regions in the Kingdom of Saudi Arabia**, MA thesis, Al-Balqa Applied University, Jordan.
- **Al-Quraiti,A.**(2013).**Gifted and talented students** (their characteristics, discovery and care), World of Books, Cairo / Egypt.
- **Mari,T& Al-Hila,M.** (2002). **General Teaching Methods**, Dar Al-Masirah, Amman.
- **Nabhan, Y.**(2008). **Mental Description and Problem Solving**, Al-Yazuri Library, Jordan.

English References:

- **Chan, D.W.**(2005). Emotional Intelligence, Social coping and Psychological distress among Chinese gifted students in Hong Kong. **High Ability students**, 16 (2). 163-178.
- **Clark, B,** (1992), **Growing up Gifted, Fourth Edition**, New York: Macmillan Publishing Company.
- **Evan, A.** (2016) .Examination of gifted students probability problem Solving process. In Terms of Mathematical Thinking. Malaysian on line, **Journal of Educational Technology**, 2016, (volume (4), Issue 4, (18-35).
- **Hughes,C.**(2000).**A comparative study of teaching critical thinking through persuasive writing to average gifted and students with learning disability**. Un published PHD thesis the college of William and Mary, USA.

- **Niehart,M.**(1999). The impact of giftedness on Psychological well-being.**Poeper Review**, 22 (1), 122-149.
- **Porter, L.**(1999). **Gifted Young Children. A guide for teachers and parents**, Backing ham, U.K .: open university press.
- **Saygli,G.**(2012). Determination the problem solving of Gifted Talented Students **International Online Journal of Primary Education** - 2012, volume 1, issue 1 (31-36).