

## THE LEVEL OF PROBLEM-SOLVING SKILLS OF GIFTED STUDENTS IN JORDAN, A COMPARATIVE STUDY BETWEEN THE SCHOOLS OF EXCELLENCE AND THE JUBILEE SCHOOL

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### ABSTRACT

Problem-solving skills are considered one of the essential skills of the twenty-first century because nations and individuals face various problems. This study aimed to determine the level students of grade nine of King Abdullah II schools for excellence and Jubilee school in Jordan in Problem-Solving skills and a comparison between the levels of the two groups in these skills. The study sample comprised 23 students from the Jubilee School in Amman (Private school) and 30 students from Schools of Excellence in Madaba Governorate (Government school). They were randomly selected from the study population. The research used the Heppner test to determine the level of students' possession of problem-solving abilities. This tool was chosen because of its scientific fame, Arabization, and suitability for the Jordanian environment. The validity and reliability of the instrument have been verified. To reach the results, the researchers used the Statistical Package for Social Sciences SPSS version 25. Descriptive statistics were used, and an independent T-test was used to determine whether there were statistically significant differences between the averages of the two groups. The results showed that gifted students in the two groups possess good skills in solving problems. The results also showed that the Jubilee School students outperformed their counterparts in Schools of Excellence in these skills. The paper suggested recommendations regarding the results of the study.

**Keywords:** Problem-Solving, Gifted students, Jubilee School, King Abdullah II Schools for Excellence, Heppner Test.

## **1. Introduction**

Educational systems are keen to build learner awareness what he performs in terms of tasks, developing his efficiency and ability to think, creativity, innovation and imagination, and finding solutions to the various problems he faces and which make up an obstacle to his progress and achieving his goals (Bubakri & Neama, 2020).

Countries at the global level have been keen on developing the skills of their members in line with the spread of problems, their diversity, and depth, and Jordan has endeavored to create the capabilities of its students in the skills related to the twenty-first century, which includes the ability to solve problems by providing schools dedicated to the care of the gifted, whether in public or private schools. The rapid change in the world demands attention to different skills than previously (Ministry of Education, 2019).

The skills of problem-solving are essential because they are linked to many desirable characteristics in any society, as it develops self-confidence (De Fleith et al., 2002; Farahat, 2015), encourages the student to build his knowledge (Zaytoun, 2004), and prompts the student to reach his goal with confidence and distinction (Abu Qurah, 2012) Also, the ability to solve problems by developing the student's scientific skills (Abu Rayyash & Qutait, 2008; Zaytoun, 2004), and improving his relationships with others such as his family, colleagues, teachers, and members of his community (Daunic et al., 2000), also it helps in maintaining community security and reducing crime (Ahmad, 2010), besides, it emphasized some positive impact of problem-solving ability on students' mental health (Asimopoulos et al., 2018). The ability to solve problems is also an essential motivation for thinking (Al-Zayyat, 2001). This ability benefits the student and benefits his community (Al-Tabeeb & Al-Malool, 2016). On the other hand, Makhloofy and Budiaf (2017) indicated that problem-solving technique helps develop creative thinking skills. The importance of problem-solving ability is also evident at the top of the learning pyramid. The student uses his skills and experiences to reach a creative solution to the problem he faces (Melhim, 2002). In the same context, Farahat (2015) indicated that providing students with the problem-solving skills leads to developing their affiliation with their religion and homeland, increasing students' self-reliance, increasing confidence in their abilities, and respecting themselves.

Amidst global interest in twenty-first-century skills, including thinking skills and the ability to solve problems, Jordan seeks to provide its students with the skills needed for the twenty-first century by providing them with a suitable environment to train on these skills, and Jordan is considered one of the first countries interested in developing thinking skills. Interest in this category began in the seventies of the last century and the formation of the Arab Council for the Gifted and Talented, which is based in the Jordanian capital, Amman.

One of the manifestations of this interest is the establishment of the Jubilee School, as this school was the first school specialized in nurturing the gifted in the Middle East and the Arab world (Jubilee School, 2020). Then, the pioneer centers were established that work to promote the gifted outside the official working hours of the schools and the support classes that were allocated to the gifted and take care of their needs, and the King Abdullah Schools of Excellence (Ministry of Education, 2018).

This study aims to determine the ability of gifted students to solve problems in the Jubilee School and King Abdullah II Schools for Excellence and to compare the averages of students' scores in problem-solving skills adopted by Heppner assessment, namely: Problem Identification, outlining of problem, Construction of alternatives, Making decisions, and Assessment.

It is expected that this study will open the way for other research related to developing students' skills in the ability to solve problems, discuss ways of cooperation between schools specialized in caring for the gifted and talented, in making the most of the expertise available in these institutions.

## **2. Background and Rationale**

In a study conducted by Saygili (2014) aimed to compare the average performance of gifted and ordinary students in the ability to solve problems, the study results showed no statistically significant differences between the performance of the two groups.

Dreeb (2014) conducted a study aimed at comparing the performance of gifted and ordinary students in problem-solving skills. The study sample consisted of 240 male and female students from the fifth grade of high school from gifted and ordinary students classified according to their schools. The researcher concluded that The level of gifted students in the ability to solve problems was also average. In the same context, Ucar et al., (2017) study determine the extent to which gifted students in Turkey possess problem-solving skills; the study results showed that the level was not high and that student ownership was not as expected from this category.

The results of these studies are in line with the results of the Al-Fasatlah (2015) study, which aimed to study the extent to which students of King Abdullah II Schools for Excellence possess the skills of problem-solving ability, as the results showed the level of students in these skills was average, which is below the expected level for this influential group in society. In the same context, Hasoon (2019) conducted a comparative study on the extent to which gifted and ordinary students possess the ability to solve problems. The study sample consisted of 240 ordinary students and 138 gifted students. The study concluded that there are no statistically significant differences in the average students' scores in skills Ability to solve problems attributable to classification (gifted, ordinary).

After a review of the theoretical literature, few studies are concerned with measuring problem-solving ability. It also appears from the results of previous studies that insufficient attention is paid to developing the ability to solve problems among gifted students at the global and local levels. Nevertheless, the Jordanian Ministry of Education is striving to develop the skills of its gifted students, whether through private schools such as the Jubilee School and the government schools such as King Abdullah II Schools of Excellence.

Several studies indicated that gifted students lack problem-solving skills, such as the study of (Al-Fasatlah, 2015; Dreeb, 2014; Hasoon, 2019; Ucar et al., 2017), this study seeks to know the level of gifted students in Jordan (in public and private schools) in these skills and opens the way for decision-makers to cooperate between administration private and government schools to transfer experiences to enrich the educational process associated with gifted students and develop their skills. Besides, this research paper also seeks to compare the

performance of the students of the two schools in the ability to solve problems so that the educators in the schools and decision-makers can overcome the difficulties for cooperation between the specialized schools that take care of the gifted and benefit from the experiences carried out by both private and government schools, which helps in developing the performance of gifted students and allocating support programs for them. Determining the level of gifted individuals possessing the skill of problem-solving ability will help all parties to the educational process to develop the gifted skills and achieve the strategic goals of the Jordanian Ministry of Education and build training programs for teachers, students, and parents to achieve this strategy.

### **3. The Study Terms**

In this paragraph, researchers will review the study concepts as below:

#### **3.1. Problem-solving Skills**

Problem solving skills are among the most important skills of the twenty-first century that the educational system must provide to students (Gravemeijer et al., 2017; Hokanson, 2017). Jarwan and Alabbadi (2010) defined problem-solving as a complex process in which an individual uses his skills and experiences to address a specific situation to reach his goal. Besides, Daunic et al., (2000) mentioned that students' possession of this skill improves their self-confidence and develops their social relationships and intellectual abilities. Furthermore, providing learners with complex problems and training them to deal with them in the classroom and outdoor activities enhances self-confidence and awareness of the actual world (Ukobizaba et al., 2020).

#### **3.2. Gifted Students**

Jøsendal et al., (2016) indicated that gifted children are children with unusual and high educational potential. Besides a gifted student is defined as one who surpasses his classmates in one or more fields, provided that this distinction is of value in the society to which the student belongs (Reis & Renzulli, 2004); a person gifted in one culture may not be seen as gifted in another (Dai & Chen, 2013). Besides, gifted students are the hope of nations and the source of their advancement (Al-Qummash & Al-Maaytah, 2014); therefore, it seeks Countries to take advantage of this category to achieve their goals (Al-Tabeeb & Al-Malool, 2016).

#### **3.3. King Abdullah II Schools for Excellence**

Because of the importance of nurturing gifted students globally and regionally, a royal decree was issued in the year 2000 to establish King Abdullah II Schools for excellence that aims to develop the capabilities of gifted students and benefit from their potential. The gifted students are selected from regular schools; they take tests to measure their abilities and personal interviews who meet the affiliation requirements. Students are offered special sponsorship programs and the Ministry of Education curriculum, such as leadership programs, programming training, and community service programs (Ministry of Education, 2015).

### **3.4. Jubilee School**

A non-governmental school whose establishment was announced in 1977 and the school was launched in 1993/1994 as the first institution specialized in teaching academically gifted and talented students in the Arab region. The school cooperates in its programs with the Ministry of Education and implements special academic, cultural, and social programs for students affiliated with it (Jubilee School, 2020).

## **4. Objectives of The Paper**

This study seeks to achieve the following objectives:

- To examine the problem-solving skills of gifted students at King Abdullah II schools for excellence.
- To examine the problem-solving skills of gifted students at Jubilee School.
- To determine whether there are any differences between gifted students at King Abdullah II schools for excellence and gifted students at Jubilee School in the solving-problems skills.

## **5. Hypotheses**

The article covers the following hypotheses:

- 1) There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of Problem Identification.
- 2) There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of outlining of problem.
- 3) There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of Construction of alternatives.
- 4) There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of making decisions.
- 5) There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of Assessment.

## **6. Limitations of The Study**

The study is limited to:

The study sample consisted of gifted ninth-grade students affiliated to the Jubilee School in the Capital Governorate and King Abdullah II Schools of Excellence in Madaba Governorate. The King's Schools Affiliates. Data were collected in the first semester of the 2019-2020 academic year, using the study tool, which is the Heppner problem-solving assessment.

## **7. Methodology**

### **7.1. Paper Approach**

This paper used the descriptive and analytical approach; to examine the level of problem-solving ability of gifted students in King Abdullah II schools for excellence and the Jubilee School and to determine whether there were statistically significant differences in those skills between students in the two schools.

### **7.2. Participant:**

The study sample consisted of 30 male students from Schools of Excellence in Madaba Governorate and 23 students from Jubilee School, who were randomly selected. The students from grade nine. The research paper included students affiliated with these schools in the first semester of the academic year 2019/2020.

### **7.3. The Instrument**

To achieve the research objectives, which is to determine the level of gifted students in the Jubilee Private School and the King Abdullah II School of Excellence in Madaba Governorate in the ability to solve problems, the Heppner test, translated by Hamdi(1998) which was adapted to Jordan environment, was used. The questionnaire includes five areas, and each area includes eight questions that the student answers according to what suits his situation when confronting the problem. The answer includes four levels: apply completely to me, apply to me to a moderate degree, apply to me in a weak degree, do not apply to me at all. The student gets scores 4,3, 2, and 1, respectively. A student who scores 80 points or more has an adequate problem-solving ability, and a student whose total score is less than 80 lacks problem-solving skills.

The study tool was presented to ten university professors and experts in giftedness and creativity to verify the tool's validity. The Alpha Cronbach equation was used to ensure the reliability of the tool. The reliability value between all paragraphs was (0.86), an acceptable percentage for adopting the tool.

The tool developer-approved correction guide has been relied upon to achieve objectivity. The tool included forty paragraphs divided into five domains names: Problem Identification, outlining of problem, Construction of alternatives, Making decisions, and Assessment, where the student answers each paragraph with one of the answers: Applies to me with a high degree, applies to me with a medium degree, applies to me at a weak degree, does not apply to me. After collecting the data, the Statistical Package for Social Sciences(SPSS) version 25 was used to extract the results and used t-test for two independent groups.

#### **7.4. Data Analysis**

Descriptive statistics were used as the mean and the standard deviation to determine the level of gifted students in both schools in the ability of problem-solving skills. The study also used SPSS version 25 to achieve the second objective, using the independent t-Test to study whether there were statistically significant differences between the students' averages of scores from each problem-solving skill.

### **8. Findings**

Based on the objectives of the study, we can detail the results as follows  
Results related to the first objective:

#### **8.1. First Objective:**

*To examine the problem-solving skills of gifted students at King Abdullah II schools for excellence.*

After collecting data related to performing gifted students in King Abdullah Schools for Excellence in Madaba according to the Heppner test, the results showed that the average score of students reached 75.53, a level close to the acceptable level for these skills according to the correction guide.

#### **8.2. Second Objective:**

*To examine the problem-solving skills of gifted students at Jubilee School.*

The answers of the gifted students in the Jubilee School were dealt with the same way as the answers of the students of the King Abdullah II School for Excellence, where the average score of the students in Jubilee school was 78.17, which is also a level close to the acceptable level of skill.

This result is in agreement with the studies of (Al-Fasatlah, 2015; Dreeb, 2014; Hasoon, 2019; Ucar et al., 2017), Where they indicated that students' results on the test of problem-solving ability do not match the skills of gifted students.

This result confirms the need to pay attention to this skill in an organized scientific manner, and teachers must be trained in this skill by competent specialists.

And to find out if there are statistically significant differences between the mean scores of the students in the total of the test, the independent T-test was used for the two independent samples, and the results were as in (Table 1)

*Table 1: Results for independent t-test for overall Heppner test for Excellence school and Jubilee school*

Groups	Excellence S		Jubilee S		Mean diff	t value	p-value
	Mean	(±SD)	Mean	(±SD)			
Over all scores on Hepp.	75.53	4.13	78.15	4.37	2.64	19.342	0.029

The results in the table show that there are statistically significant differences between the mean scores of students in the results of the overall Heppner test for the ability to solve problems in favor of students in the Jubilee School, as the p-value is less than (.05). The average score of students of the Jubilee School is greater than the average score of students in Schools of Excellence.

This result is in agreement with the studies of (Al-Fasatlah, 2015; Dreeb, 2014; Ucar et al., 2017), Where they indicated that students' results on the test of problem-solving ability do not match the skills of gifted students. This result confirms the need to pay attention to this skill in an organized scientific manner, and teachers must be trained in this skill by competent specialists.

### 8.3. Third Objective

*To determine whether there are any differences between gifted students at King Abdullah II schools for excellence and gifted students at Jubilee School in the solving-problems skills.*

To achieve this objective, five hypotheses emerged that must be tested:

#### 8.3.1. Hypothesis One:

*There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of Problem Identification.*

A suitable statistical test to test this hypothesis is the two independent samples T-Test. Table (2) shows the test results:

*Table 2: Results for independent t-test for Problem Identification in Heppner test for Excellence school and Jubilee school*

Skill	Excellence Sch.		Jubilee Sch.		Mea	t	p-
	Mean	±SD	Mea	±SD)			
<i>Problem Identification on of Hepp.</i>	15.20	1.66	20.8	2.70	2.64	9.30	0.00



This hypothesis was rejected because the statistical test results show that there are statistically significant differences between the averages of the students in the two schools in favor of the students of the Jubilee School, as the value p-value is 0.00, which is less than .05. The average score of the students of the Jubilee School is higher than the average scores of the students of the School of Excellence.

### 8.3.2. Hypothesis Two:

*There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of outlining of problem.*

Also, for this hypothesis, the suitable statistical test is the two independent T-Test. Table (3) shows the test results:

*Table 3: Results for independent t-test for Outlining of Problem in Heppner test for Excellence school and Jubilee school*

Skill	Excellence S		Jubilee S		Mean	t value	p-value
	Mean	(±SD)	Mean	(±SD)			
Outlining of Problem on of Hepp.	15.46	1.50	22.04	2.60	6.75	11.21	0.00

Also, this hypothesis was rejected because the statistical test results show that there are statistically significant differences between the averages of the students in the two schools in favor of the students of the Jubilee School, as the value p-value is 0.00, which is less than .05. The average score of the students of the Jubilee School is higher than the average scores of the students of the School of Excellence.

### 8.3.3. Hypothesis Three:

*There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of Construction of alternatives.*

The suitable statistical test for this hypothesis is the independent T-test; table 4 shows the test results.

*Table 4: Results for independent t-test for Construction of Alternative in Heppner test for Excellence school and Jubilee school*

Skill	Excellence S		Jubilee S		Mean	t value	p-value
	Mean	±SD	Mean	±SD			
Constructive of Alternative on of Hepp.	15.40	1.83	22.41	2.66	6.81	11.04	0.00

This hypothesis was rejected because the p-value less than 0.05. The results also show that the performance of the Jubilee School students was better than the performance of their peers at the King Abdullah School for Excellence.

#### 8.3.4. Hypothesis Four:

*There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of Making decisions.*

To test this hypothesis, the independent t-test was used. Table 5 shows the results of the statistical test.

*Table 5: Results for independent t-test for Making a decision in Heppner test for Excellence school and Jubilee school*

Skill	Excellence S		Jubilee S		Mean diff	t value	p-value
	Mean	(±SD)	Mean	(±SD)			
Making descisions	15.10	2.35	23.26	3.33	8.16	10.44	0.00

Since the p-value is less than .05, the hypothesis was rejected. The results also showed that the jubilee students' performance is better than the students in King Abdullah II Excellence school in this skill.

#### 8.3.5. Hypothesis Five:

*There are no statistically significant differences between the average grades of gifted students in the Schools of Excellence and the Jubilee School in the skill of Assessment.*

The suitable statistical test to test this hypothesis is the independent T-test. Table 6 shows the results of the statistical analysis.

*Table 6: Results for independent t-test for Assessment in Heppner test for Excellence school and Jubilee school*

Skill	Excellence S		Jubilee S		Mean diff	t value	p-value
	Mean	±SD	Mean	±SD			
Assessment	14.36	2.26	20.69	3.03	6.32	8.69	0.00

The hypothesis was rejected because the results of the statistical analysis show that there are statistically significant differences in performing the students in the two schools in favor of the Jubilee School, where the p-value was less than .05 and the average grades of students in the Jubilee School were higher than the average of their peers in the King Abdullah II School of Excellence.

Within the knowledge of researchers, there are no studies that compared the performance of gifted students in private schools and public schools in the skill of problem-solving ability. However, several studies compared the performance of gifted students and ordinary students as the study of Saygili (2014). In his study, he concluded that there are no statistically significant differences between the average grades of gifted students and ordinary students in the skill of problem-solving ability. The results confirm the preference of gifted students in the Private Jubilee School over gifted students in the School of Excellence in Madaba in the skill of problem-solving ability. These differences may be how students are selected in the Jubilee School and the nature of the enrichment

materials provided to students, and the training component for teachers may have a role in developing these skills. Maybe the examinations deprive students of many skills because the learning will aim to memorize the content of the subjects without concern for developing their skills.

## **9. Discussion**

The results of the study concluded that the level of gifted students in the two schools (Jubilee and Excellence schools) is close to the acceptable level; This level does not correspond to the abilities that gifted students usually possess. These results are in agreement with the study of (Al-Fasatlah, 2015; Dreeb, 2014; Hasoon, 2019; Ucar et al., 2017), the researchers explain these results because problem-solving skills, like other skills, need to be nurtured and trained, and not paying attention to them leads to losing them (Mohamed et al., 2019). Also, one of the reasons for this result is the excessive interest, whether from teachers or school administration and parents, in academic achievement without taking care of developing the necessary skills such as thinking skills and the ability to solve problems. Besides, teachers are generally keen to finish the curriculum without paying attention to the way in which the content should be dealt with educational (Ayasreh & El-Omari, 2016). The lack of clear programs to train teachers on these skills may also have a role in the weakness of these skills (Mahmoud et al., 2020). We can add also the low care of curriculum for these skills (Abdelkader et al., 2020; Dahalan, 2020).

On the other hand, parents neglect to take care of these skills and are keen on academic achievement only, due to the nature of the tests performed by children that are based on knowledge and do not care about skills.

## **10. Conclusions and recommendations**

The study aimed to determine the skill level of problem-solving ability in King Abdullah II Governmental Excellence Schools and the Jubilee Private School. It also aimed to compare the performance of gifted students in the two schools in problem-solving skills. The results showed that the level of students in the two schools is close to the acceptable level. However, the Jubilee School students outperformed their colleagues in King Abdullah Schools in the general average for testing the ability to solve problems. The results also showed that the Jubilee School students excelled in the five skills measured by the study. These skills are Problem Identification, outlining of problem, Construction of alternatives, Making decisions, and Assessment. In the same context, the results of this study are limited to a small sample of the two schools and to the temporal-spatial conditions in which the Heppner test was applied. The results of this study help decision-makers, school principals, teachers of gifted students, parents, and gifted students to develop the capabilities of gifted students and develop their orientations towards essential life skills such as the ability to solve problems. This study also helps principals cooperate to transmit experience and benefit from experiences for both public and private schools. The researchers recommend training teachers, students, and parents on this important skill and exchanging visits between teachers in different schools to exchange experiences and successful experiences. This study opens the way for researchers to determine the reasons for distinguishing students from some schools over other schools. It also opens the doors to other studies related to designing joint training programs between schools and studying their impact on developing gifted students' abilities.

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