

**THE EFFECTIVENESS OF HABITS OF MIND
TRAINING PROGRAM ON JORDANIAN GIFTED
STUDENTS' CREATIVE THINKING AND
PROBLEM-SOLVING SKILLS**

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PROBLEM-SOLVING SKILLS**

by

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LIST OF ABBREVIATIONS

APKNS	Applying Past Knowledge to New Situations.
CT	Creative Thinking
H.o.M	Habits of Mind
HTSP	Heppner Test for Solving-Problem
KASE	King Abdullah II Schools for Excellence
L.U.E.	Listening with Understanding and Empathy.
P	Persisting.
QPP	Questioning and Posing Problems.
R.W.A.	Responding with Wonderment and Awe.
ROCL	Remaining Open to Continuous Learning.
T.F.	Thinking Flexibly.
T.I.	Thinking Interdependently.
TCTT	Torrance Creative Thinking Test
USM	University Science Malaysia.

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**KEBERKESANAN PROGRAM HABIT OF MIND KE ATAS KEMAHIRAN
BERFIKIR KREATIF DAN MENYELESAIKAN MASALAH DALAM
KALANGAN MURID PINTAR CERDAS DI JORDAN**

ABSTRAK

Pelajar pintar adalah aset kekayaan di mana-mana negara, maka ia menjadi satu keperluan bagi pelajar-pelajar ini untuk memiliki kemahiran pemikiran kreatif dan keupayaan menyelesaikan masalah. Penyelidikan ini bertujuan untuk mengkaji keberkesanan program latihan *Habits of Mind* mengenai pemikiran kreatif dan kemahiran menyelesaikan masalah di kalangan pelajar pintar Jordan. Kajian ini menggunakan rekabentuk deskriptif dan mod campuran. Rekabentuk deskriptif digunakan untuk menjelaskan penggunaan program latihan *Habits of Mind*, manakala rekabentuk mod campuran menggunakan pendekatan kuantitatif (Quasi-eksperimental) dan pendekatan kualitatif (temu bual). Sampel kajian terdiri daripada 80 orang pelajar pintar dari King Abdullah II Schools Excellence di Madaba Governorate, Jordan. Sampel dipilih menggunakan pendekatan berstrata secara rawak. Pelajar dibahagikan kepada dua kumpulan, iaitu kumpulan kawalan dan kumpulan eksperimen.. Kajian menggunakan *Torrance Creative Thinking Test* (TCTT), *Verbal Figure (A)* dan *Heppner Test* untuk mengukur kebolehan menyelesaikan masalah (HTSP) selain menggunakan pendekatan kualitatif kaedah temu bual untuk pelajar (8 orang pelajar yang mengambil bahagian dalam program Latihan) dan guru melaksanakan program tersebut (dua orang guru dan pengetua sekolah). Untuk mencapai keputusan kajian, min, sisihan piawai, ujian-t bebas dan berpasangan, ujian ANOVA telah digunakan. Program NVIVO digunakan untuk menganalisis temu bual. Hasil kajian menunjukkan tahap kebolehan berfikir kreatif dan menyelesaikan masalah

pelajar adalah sederhana. Hasil kajian juga menunjukkan terdapat perbezaan yang signifikan secara statistik antara skor purata kumpulan eksperimen dalam kebolehan berfikir kreatif dan kebolehan menyelesaikan masalah selepas melaksanakan program. Kajian ini mempunyai kesan statistik yang signifikan terhadap faktor umur dan kelas, dimana pelajar berumur empat belas tahun dalam Kelas Sembilan menunjukkan kebolehan berfikir kreatif dan keupayaan untuk menyelesaikan masalah. Walaupun tiada kesan statistik yang signifikan bagi urutan kelahiran, tahap pendidikan bapa, atau tahap pendidikan ibu terhadap kebolehan berfikir kreatif atau kemahiran menyelesaikan masalah. Selain itu, hasil temu bual dengan pelajar pintar dan guru mereka menunjukkan kesan positif program latihan dan bantuannya dalam membangunkan pemikiran kreatif dan kebolehan menyelesaikan masalah mereka. Kekuatan keputusan kajian ini terletak pada pergantungannya pada program berasaskan teori moden dalam kajian proses mental dan pergantungannya pada keupayaan dan pengalaman peribadi pelajar dan persekitaran merangsang pemikiran. Kajian ini menekankan kepentingan perkongsian antara keluarga dan sekolah untuk memenuhi kehendak dan keperluan pelajar pintar. Kajian ini juga mengesyorkan kajian lain dilaksanakan untuk menunjukkan kesan program latihan yang digunakan dalam kajian ini terhadap kemahiran lain seperti pemikiran kritis, membuat keputusan, dan kemahiran lain.

**THE EFFECTIVENESS OF HABITS OF MIND TRAINING PROGRAM ON
JORDANIAN GIFTED STUDENTS' CREATIVE THINKING AND
PROBLEM-SOLVING SKILLS**

ABSTRACT

Gifted students are the wealth of any country, so it is necessary for this group of students to have creative thinking skills and problem-solving ability. This research aimed to study the effectiveness of Habits of Mind training program on Jordanian gifted students' creative thinking and problem-solving skills. Descriptive and mixed-mode design was used. A descriptive design was used to explain the use of the Habits of Mind training program. A mixed-mode design uses a quantitative approach (Quasi-experimental) and qualitative approach (Interviews). The study sample comprised eighty gifted students from King Abdullah II Schools of Excellence in Madaba Governorate in Jordan. The sample was chosen with a randomized stratified approach. The students were divided into two control and experimental groups. The study used the Torrance Creative Thinking Test (TCTT), Verbal figure (A) and the Heppner Test to measure the ability to solve problems (HTSP) besides using the qualitative approach using the interview method for the students (8 students) taking part in the training program and the teachers (two teachers, and principal) implementing the program. To reach the results of the study, means, standard deviations, independent and paired t-test, also ANOVA test were used. NVIVO program was used to analyze the interviews. The results showed that the students' level of creative thinking abilities and solving-problems was moderate. The results also showed that there are statistically significant differences between the average scores of the experimental group in creative thinking abilities and the ability to solve problems after implementing the program. The study

had a statistically significant effect of age fourteen and class nine on creative thinking abilities and the ability to solve problems to benefit older students and class. While there was no statistically significant effect of the birth order, the father's educational level, or the mother's educational level on the creative thinking abilities or problem-solving skill. Also, the results of interviews with gifted students and their teachers showed the positive effect of the training program and its help in developing their creative thinking and problem-solving abilities. The strength of this study's results lies in its reliance on a program based on modern theory in the study of mental processes and its reliance on the student's capabilities and personal experiences and the environment stimulating thinking. This study stresses the importance of the partnership between the family and the school to meet the gifted student's desires and needs. The study also recommends conducting other studies to demonstrate the effect of the training program used in this study on other skills such as critical thinking, decision-making, and other skills.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Creative thinking probably is one of the most important personal strategy for survival and success in our complex world, which has a multitude of issues that need solutions (Dawes, 2012). Creative thinking is defined as a brain activity that gathers all the person's thinking ability to bring up different ideas and new content (Susanti et al., 2020). Nadeem et al. (2012) mentioned that creative thinking abilities are consist of the abilities: fluency which related to the number of ideas produced, flexibility: which related to the different categories of ideas produced, and originality which related to the uncommonness or the infrequency of an idea. Cotton (1991) showed the importance of thinking where it increases the learner's capacity to adapt the information to new matters. Also, thinking makes the students analyze, synthesize, and infer the relationships between the knowledge they receive. Al Oboushy (2008) pointed out that thinking helps to acquire the skills of learning processes, where thinking organizes these processes and allows the student to deal with information positively. On the other hand, studies have shown that the teaching of thinking skills, including creative thinking, leads to raising the level of student achievement because the student is thinking about independence in his idea and initiative and apply what he learned in real life to innovate and develop and adds to knowledge (Al-Nafea, 2008). More so, Creative thinking fosters a sense of self-confidence in the face of school tasks and life (Al-Zahrani, 2008). Al-Taher (2008) stressed that teaching thinking aims to raise educational attainment rates for gifted students. Besides, the development of creative thinking skills develops the student's self-confidence (Al-Zahrani, 2008), improves his

academic performance (Al-Taher, 2008), develops his abilities to analyze and synthesize (Al Oboushy, 2008), helps him in organizing his knowledge (Al-Nafea, 2008), and helps him to decide and solve the problems in more creative ways (Treffinger, 2016). Besides, Susanti et al. (2020) mentioned that creativity is a planning to find problem-solving. Many problems can be solved by creating new ideas or strategies. Heppner and Petersen (1982) specify the problem-solving skills as problem identification, outlining of the Problem, construction of Alternatives, Making Decisions, and Assessments. The student's possession of these problem-solving skills in adolescence is an important thing because he becomes more able to solve the problems he faces (Rotta, 2004).

The gifted students represent the highest levels of human energy needed by the society to face the interlocking challenges, which confirms the responsibility of teachers to discover and sponsor this category through the design of programs appropriate to their abilities and develop it (Al-Qummash & Al-Maaytah, 2014). A gifted student is a student who possesses abilities that exceed his peers in one or more of the areas valued by society. Usually, these students need special care and curricula that meet their needs (Al-bisher, 2021). Therefore, caring for the creative thinking and their problem-solving skills is important in our societies. Besides, the gifted are considered an essential wealth that must be nurtured to guide them to develop the society in the future (Al-saady, 2009). Developing gifted students' skills includes identifying gaps in those skills and developing specialized programs to address these gaps (California State Personnel, 2010). Many previous studies such as (Abdeen, 2016; Costa & Kallick, 2003c; Swartz & Barks, 2005) indicated that gifted students need training programs to hone their abilities in many skills such as creative thinking and problem-solving ability. Hasan (2004) definition the training program as an education

process that includes acquiring skills, concepts, rules, and trends to continuously increase and improve an individual's performance.

However, there are conflicting opinions about the extent to which gifted students possess creative thinking and problem-solving abilities, and a general lack of research regarding the level of gifted adolescent students in these skills and how best to develop these skills. Similarly, the ability to think creatively and problem-solving skills are among the most important skills of the twenty-first century that cannot be dispensed with, whether for ordinary or gifted individuals. The results of the studies (Al-qablan, 2017; Radhi, 2015; Rasras, 2006) showed that teachers' interest in applying thinking skills was in average. Continuously, the teacher is the source of information, which hinders the gifted student's freedom of thinking and support for his skills and social relations and losing the gifted students of the opportunity for self-development and reflection and facing his own problems effectively, which affects his academic level.

It is logical if we want the gifted student to have a positive role in building his society and the world, the goal of the educational system should not be indoctrination and memorization but go beyond that to plan for the gifted student to have the ability to analyze, synthesis, creative thinking, the ability to make decisions and deal positively with the problems he faces and to be positive with his colleagues and society. Failure to provide this supportive environment for the gifted will lead to an increase in the problems of gifted students and their isolation from their society due to what is expected of them from those around them (Yiğit Tekel & Akgül, 2021).

In talking about these skills, the role of the family in developing the skills of gifted students should not be overlooked. Although research on family support for gifted students is very important, this field did not receive the appropriate attention from researchers and educational decision-makers (Baza, 2007; Hein et al., 2014). So, this study also reviews some demographic characteristics that are expected to affect creative thinking abilities and problem-solving skills such as (age, grade, birth order, father's education level, mother's education level). Especially since studies have conflicting in the effect of these demographic characteristics on the upbringing of children, and there is a dearth of studies for the gifted in this field.

Within the limits of the researcher's knowledge, there are no studies available that have investigated the effect of habits of mind on developing creative thinking skills and the ability to solve problems among gifted students, whether in Jordan or at the middle east. Few studies were available that examined the impact of habits of mind on creative thinking among ordinary students, such as Amour (2005) study in Jordan for sixth-grade (ordinary students), Rayyani (2011) study, which was appointed by seventh-grade (also ordinary students) in Saudi Arabia, Tarrad (2012) study which conducted to university students at Iraq . On the other hand, according to the researcher's knowledge, there are no studies available that show the effect of the habits of mind on developing the problem-solving skills of gifted students, these studies are not experimental. Also, there are some studies that aimed to find out the extent to which gifted students possess problem-solving skills, such as study of (Al-Fasatlah, 2015; Ucar et al., 2017). Besides There are studies that have examined the relationship between the habits of mind and the ability to solve problems in ordinary students, such as the study of (Aljezani & Wared, 2012; Bwazad & Ayesah, 2014; Omran, 2014).

Through the previous review, the great importance of this study, which covers a vital area related to an important group in society, using the latest educational theories to develop the most important skills of the twenty-first century represented in creative thinking and the ability to solve problems. So, this research aims to study the effectiveness of habits of mind training program on Jordanian gifted students' creative thinking and problem-solving skills.

This chapter will introduce the study by discussing the background, problem statement, research objectives, research questions, hypotheses, significance of the study, conceptual and operation definitions, conceptual framework, the delimitation and limitations, and the summary of the chapter.

1.2 Background of the Study

Since the early 20th century, the educational system has been based on the fact that the teacher is the center of the education process, the only source of knowledge, and the student is a recipient of information. Which led to the student's lack of confidence in his abilities and freezing his skills and interests (Jarwan & Alabbadi, 2010). in the current century humanity and the whole world are characterized by an accelerated technological and scientific revolution. The educational process is not separated from this case, making it necessary to pursue the education strategies that accompany such massive developments. The countries usually seek to produce graduates who can live in a world of rapid knowledge where they can compete with their peers in many skills that characterize the twenty-first century, the most important of which is the thinking skills. Besides, Schulte et al. (2021) study showed that contemporary education should take care of the complex needs of students, by promoting the basic standards of the twenty-first century, represented by creativity,

critical thinking, cooperation and communication. So, countries in this century view their gifted students as wealth (Al-Tabeeb & Al-Malool, 2016; Dailey, 2019). More so, their possession of the skills of the twenty-first century means these countries secure their place on the world stage, both economically and politically. In this regard, Al-Qummash and Al-Maaytah (2014) mentioned that the gifted students represent the highest levels of human energy needed by the society to face the interlocking challenges, which confirms the responsibility of teachers to discover and sponsor this category through the design of programs appropriate to their abilities and develop it.

1.2.1 The Habits of Mind

Costa and Calick came up with the Sixteen Habits of Mind by studying the behaviors of many famous people in different societies and jobs; As the commitment of these individuals to these mental habits made them more famous and influential in their societies (Campbell, 2006). Habits of Mind are modern strategies that are interested in creative thinking. Costa and Kallick (2008) mentioned that the Habits of Mind started in (1982); they called it first: intelligent behaviours, but studying problem-solving strategies, for example, is not the aim. They want new ways to habituate successful problem-solving. It's not enough to execute one action once. They want students to understand the importance of using a repertoire of mindful techniques implemented in various environments and grow skilful problem-solving capacity. Therefore, they call these arrangements habits of mind. Also, Costa and Calick Habits of Mind model is one of the modern strategies concerned with organizing students' thinking. Costa and Calick model indicated that mental abilities can be developed by making these habits of mind practices daily habits used by the individual (Costa, 2003).

The school is one of the most important places that seek to develop the individual's mental abilities and help student to build a system of habits of mind that he can choose one of them when facing a problem that he does not have a solution. The student's use of these habits of mind consciously makes him more able to find more creative solutions, as the student is no longer required to find a solution to the problems, he faces but also, he is required to find the largest number of original solutions characterized by creativity. Besides, the student is required when reaching the solution to review the steps he used to reach the solution, which makes him more aware of his way of thinking, and makes him a producer of knowledge and not just a user of it (Qatami, 2004). In this way, the student becomes aware of a way of thinking and analyzes it and modifies it. When dealing with situations in this way, habits of mind become an important part of the student's daily organized life, making his thinking more organized (Costa & Kallick, 2003a).

In addition, Rotta (2004) explained that Habits of Mind's improvement helps organize knowledge. Moreover, the management of ideas effectively and these Habits of Mind training the gifted student to manage his expertise in a new way, which develops creative thinking skills and efficiently use his information and skills, leading to creative solutions to the problems facing him.

1.2.2 Gifted Students

Reis and Renzulli (2004) defined the gifted students as a very diverse group of people with sufficiently advanced ability in one or more fields that require changes in the school environment, such as the curriculum and behaviour of teachers. Renzulli (2010) mentions that gifted behaviour consists of behaviours that indicate an

association between three primary human trait clusters: above average skills, high task engagement, and increased creativity levels.

Methodologies for dealing with gifted students depend on one of the three methods: enrichment, acceleration, and grouping.

Enrichment programs assume that the standard curriculum does not meet gifted students' needs. Therefore, it must be adapted to suit this class of students (Jarwan, 2000). The enrichment programs are programs offered to gifted students, including formal courses. Additional courses provide gifted students with knowledge, skills, creativity, and skills. The enrichment programs have two types: horizontal enrichment, which depends on the addition of modules to support the gifted student to enrich his experiences and knowledge of materials related to what he teaches. And the second kind is vertical enrichment, which depends on deepening the student's understanding of the content of specific units of the subject he is studying (The Emirates Center for Strategic Studies and Research, 2018). One of the benefits of enrichment, as Al-Maaytah and Al-bawaleez (2014) mentioned, is to raise gifted students' ability to evaluate facts and critical arguments, connect ideas, confront problems, and work to deepen the idea and broaden the horizon. To achieve enrichment benefits, the program must consider students' needs to provide appropriate educational resources, sequencing, and logical structure. It is worth mentioning that enrichment programs can be presented in many forms, such as scientific trips, summer programs, camps, competitions, exhibitions, and methodological drills.

Besides, the acceleration program is a treatment for a gifted student's problem. He needs less time than his colleagues usually need because of his mental maturity and rapid absorption and understanding. This method relieves the giftedness of the

boredom and frustration of how teachers deal with his abilities. However, it may lead to another problem that parents and teachers fear to occur, which is the weakness of a gifted student's social and sentimental growth and away from his peers (Boyes & Watts, 2009; Niehart, 2007). But these fears have nothing to do with reality and research; the acceleration system is ancient since it existed since 1916 in Urbana Illinois in the United States of America (Kulik & Kulik, 1992). As the studies also proved the effectiveness of acceleration programs in improving achievement and its effect on gifted learners' social growth (Colangelo et al., 2004; Dudien & Jarwan, 2012). Moreover, the acceleration has other benefits for the gifted student; it enhances self-confidence, increases motivation, reduces boredom, leads to the early production of gifted students, and speeds up their community service. It should be noted that acceleration has many educational fields applications, starting from early acceptance in kindergartens or grade skipping, acceleration through tests, and early admission in universities during secondary grade (Southern & Eric, 2004).

More so, one of the gifted programs is the grouping programs, which depend on gifted students in an environment that helps them develop their skills and abilities with similar age and orientation. It will lead to excitement, motivation, and competition (Al-Kuraity, 2001). Rogers (2002) pointed out that grouping types are: Enrichment power grouping, Cooperative mixed power grouping for daily training, and acceleration grouping. Ries (2009) encouraged the idea of grouping gifted students and considered it one of the best programs to support gifted people. Criticized the rejecters of the grouping programs and refuted their claims that grouping was an insult to their weak academic colleagues, stating that the benefits of these programs offered a curriculum suited to the gifted and presented strategies that fit their abilities, meet their psychological needs, and make them benefit from the experiences of each other.

Furthermore, she recommended grouping options should be available at each stage of development in a school program for gifted children, from primary to secondary. Besides, alternatives to the grouping include allocating classes for gifted students, establishing their clubs, and the learning resource room system. In Jordan, all these specialized programs are used to care for gifted students. Where there is a unique system in the acceleration of gifted students. And there are specialized schools for gifted students, such as the Jubilee school, King Abdullah II Schools of Excellence, and the schools are provided with learning rooms for the gifted to enrich their expertise, abilities, and knowledge (Ministry of Education, 2018).

1.2.3 Creative Thinking

In view of the difficulties that have emerged in the current century resulting from the 21 century problems, modern societies are keen to have their citizens possess special skills and abilities; Creative thinking abilities are considered one of the most important skills of the twenty-first century (Han & Shim, 2019; Schulte et al., 2021). Fluency is concerned with the number of answers that the individual poses, while flexibility is concerned with the diversity of answers and their fields, and this leads the person to offer original and creative solutions to the problems he faces (Lee, 2005). Creative thinking has a positive effect on individuals as it develops the student's self-confidence (Al-Zahrani, 2008), enhances his motivation to learn (Kulegel & Topsakal, 2021), improves his academic achievement (Al-TaHER, 2014), develop the student's ability to make decisions (Treffinger, 2016), It helps him organize his thinking (Al-Nafea, 2008), and help him to analyze and synthesize his information which let him to produce the knowledge (Al Oboushy, 2008).

Several studies have shown the positive impact of creative thinking on student personality development, one of these studies Baran (2011) study, which found that creative thinking can grow in students at various educational levels through training programs and study materials. This depends on the educational environment that stimulates innovation and encourages coming up with original ideas due to the availability of a suitable environment for creativity.

It seems clear through previous literary references that the teaching of creative thinking and development helps to fulfil the aims of education, and this has made researchers recommend the importance of training teachers and students on the skills of thought, in general, and especially creative thinking (Al-Hammoury, 2009; Al-Harthy, 2002; Costa & Kallick, 2003c; Jarwan, 2007; Swartz & Barks, 2005).

1.2.4 The Problem-Solving Skills

The ability to solve problems is considered one of the important abilities of students in the twenty-first century because of the diversity of problems students face now and in the future. Epstein et al. (1997) defines problem-solving ability as the ability to find a solution to or decide about dealing with an important topic. In this regard, Saygili (2014) pointed out that the problem-solving skill requires striving to remove the obstacles that prevent the individual from achieving his goals. Hamdi (1998) explains that the five problem-solving abilities are: General Attitude, Outlining the Problem, Construction of alternatives, Making Decisions, and Assessment. Although gifted students have more abilities than their ordinary peers, training them and putting them in actual situations and asking them to apply those skills makes them more effective towards the problems they face.

The researcher supposedly that the link between Habits of Mind, creative thinking, and problem-solving skills has a scientific rationale. Costa and Garmston (2015) pointed to the need to use methods and strategies taught to master the Habits of Mind that help students absorb ideas and connect the learner's various developmental stages. Therefore, these educational activities should be appropriate for the student's developmental stage and knowledge, which leads to the student's ability to cope with the daily problems that are exposed to efficiently because solve-problems skills are the essential aim of the educational process experienced by the student. Thus, there is a relation between these skills and the gifted student's future. Therefore, the gifted student's use of creative thinking skills is strong support to help him overcome the problems and confront them wisely.

The Costa model is based on giving many ideas, defending them, and understanding the relationships between various thought events, which is closely related to the growth of cognitive skills and practical skills in problem-solving (Campbell, 2006). It should be clarified here that the efforts required to solve the problems are directly related to the cognitive process; Problem-solving is in close relation with the other two ways of thinking: these are creative (divergent) thinking and critical (analytical) thinking (Çilder, 2017).

On the other hand, solving problems plays a significant role in forming the student's image of himself, which is one of the most important factors predicting his social and practical future. Also, Daunic et al. (2000) states that teaching students in the middle stage solve- problems skills and communication skills help them feel independent and increase their self-esteem, providing a safe environment that allows them to improve achievement and develop their creative skills. That is what Habits of Mind aim to.

Treffinger (2016) added some of the benefits of creative thinking and problem-solving in creative ways. It's natural for people in a group to describe their interactions with creative learning when they talk about the best and most meaningful learning experiences of all. When people discover their creativity and use it, they feel safe, happy, and productive; Engaging in creativity and creative problem solving requires cumbersome mental skills, but it is rewarding.

Numerous studies have been conducted to increase creative thinking and solve-problems skills, demonstrating the importance of these two factors in the educational process, such as studies (Al-Hadabi et al., 2009; Al-Hasan & Abdulaziz, 2015; Al-nakhalah, 2005; 2005; Seng, 2009).

So, stimulating the student's personality with an important skill such as creative thinking and problem-solving requires support from the process partners such as principals, educational supervisors, teachers, curriculum designers, and parents. Training the gifted student on these skills will push him to prove his abilities and challenge his experiences so that he can later use them to solve the problems he confronts, especially as educational literature has shown that thinking grows and improves through training (Jarwan, 2007; Padget, 2014; Qatami, 2004; Rhoder & French, 2011; Swartz, 2007; Zaytoon, 2003).

Given the above scenario, many programs are designed to develop creative thinking. These programs have different contents but are very much in line with one fundamental goal: creating and improving gifted students' giftedness to reach their full potential. With the importance of creative thinking in our Islamic religion, according to the researcher knowledge, there are no specialized training programs to improve creative thinking abilities and solve-problem skills through the Habits of Mind. As

mentioned earlier, the researchers stressed the importance of enhancing creative thinking abilities in teaching and integrating these skills in teaching. This perception is based on the hypothesis of a link between thinking and problem-solving skills. As a result, researchers must design or develop programs for those who have already demonstrated gifted to enhance their giftedness (Almutrib & Alshory, 2014; Omran, 2014; Rayyani, 2011; Takhayneh & Abu- Rayyash, 2018).

In response, the researcher designed a training program based on the Habits of Mind strategies and study its effect on developing creative thinking abilities and solve-problems skills. The aim is for students to understand and accept the Habits of Mind, to use it as an internal compass to guide their feelings, actions, and decisions in their learning and everyday lives (Costa & Kallick, 2009).

By reviewing the studies that focused on designing training programs to develop the abilities of gifted students, the programs that sought to develop creative thinking abilities and solving problem skills through habits of mind in the middle adolescence stage are few and rare. as an example, Amour (2005) conducted a study for seventh-grade normal students, while Tarrad (2012) study included university students, Aljezani and Wared (2012) study, which targeted ordinary sixth-grade students, Al-Shammary (2013) study, which targeted high school students , and Adam (2017) study for university students. According to the researcher's knowledge, there are no training programs based on habits of mind and aiming to develop gifted students' creative thinking abilities and problem-solving skills. However, the researcher found a study by Baseer (2019) targeting gifted preschool children in the Kingdom of Saudi Arabia.

With this reality that appeared to the researcher, he found it necessary to design a program based on the habits of mind and targeting gifted students at an important age, which is the middle adolescence period.

1.3 Problem Statement

Educators agree that gifted students differ in their capabilities from other students, which confirms the necessity of providing a suitable environment for their abilities (Al-Sharbeny & Sadiq, 2002). The development and taking care of gifted students' skills are linked to providing an educational environment appropriate to their needs. So, gifted students' good performance is related to providing an educational environment relevant to their needs (Cash, 2009). For gifted students to benefit from their abilities, they must obtain various learning methods appropriate to and challenging their abilities (Renzulli, 1998). According to Ucar et al. (2017), Kanli and Emir (2009) indicated that gifted students do not receive an educational appropriate to their schools' abilities. Suppose the teacher does not provide a suitable teaching strategy for the gifted; in that case, our expectations towards the gifted performance can solve problems, and other academic skills may fail (Rotigel & Fello, 2004). Teaching gifted students in traditional ways makes them feel frustrated because they have nothing to challenge their capabilities, and develop their desires, which leads to the suppression and weakening of these capabilities. Awamleh and Zraigat (2012) mentioned that most creative students suffer significantly from a lack of knowledge about accurately detecting their creative skills and learning aspects of giftedness and creativity strengths and weaknesses. Qatami et al. (2018) conducted a study in Jordan that aimed to determine the degree of use of strategies for teaching creative thinking among teachers of gifted students in Jordan. The study showed that teachers' use of

these strategies was moderate. To clarify the study problem, we can say that the thinking abilities and Creative Thinking, in particular, do not match the capabilities and skills of gifted students. Alrasheedy et al. (2015) study on gifted students in the secondary stage, which included (82) male and (94) gifted female students, the results showed that the students' level in the creative thinking test was average. In the same context, Mukhtar and Fathi (2015) conducted a study aimed at determining the extent to which gifted students in the middle stage possess the skills of creative thinking in writing, as the study sample comprised 43 gifted students, and the researcher used a questionnaire to identify the creative writing skills of the gifted and test creative writing skills, the results of the study showed a low level of the sample's students in creative language performance skills (fluency, flexibility, originality, and details).

Turkey (2018) also conducted a study to compare creative thinking among ordinary and gifted students. The sample included 60 male and female students from the eighth and ninth grades in King Abdullah II schools for excellence in Tafila; the results showed that all the participating students' level was average, although the gifted students performed better than the ordinary students in the creative thinking test. The previous results were consistent with Alqaisi and Altamimi (2015) study, which aimed to compare the level of creative thinking among gifted and ordinary students, as the sample included 469 male and female students from the preparatory, secondary classes. Study results showed that the level of creative thinking among students was acceptable. Ayasrah and Hamadneh (2010) study, which aimed to know the level of creative thinking among high school students, corresponds to previous studies. The sample included 250 students, and the results indicated that the level of students in creative thinking skills was within the educationally acceptable average.

Besides, Aljanabi and Kareem (2015) study aimed to measure creative thinking capabilities among students at the Institute of Fine Arts, where the study sample included 50 students, results showed a low level of creative thinking among students. Besides, Alhadabi and Alashwal (2012) study supported the previous study results, which showed that gifted students' thinking skills exams did not reach an acceptable educational level and recommended the need to provide thinking programs innovative thinking for gifted students. The results are consistent with the results of Anati (2019) study which aimed to assess the creative abilities of gifted students in public schools in Al- Madinah Al –Munawwarah on Measure of Abraham Temple. The study sample comprised 117 students in Intermediate stage. They were chosen using a stratified cluster random sample. The study results showed the General level of creative capabilities is low, and the creative abilities: fluency, flexibility is Medium, while originality is low.

Moreover, a study was conducted on a sample of secondary students aiming to determine the level of thinking; the results showed a low level of thinking and a positive relationship between thinking and academic achievement (Alsharqi, 2005). The previous studies indicated that gifted students' creative thinking ability at the intermediate level converges with ordinary students' level. This level is not commensurate with their actual skills, which puts officials, educators, parents, and gifted students themselves face an essential responsibility to clarify why the gifted performance of creative thinking tests is not appropriate to their capabilities. The results of these studies are supported by Aljohani (2018), which found a low level of gifted students in creative thinking skills in Saudi Arabia. These results are also consistent with the study (Al-Huraibi 2010).

Regarding the extent to which gifted students have the ability to solve problems, in a study conducted by Al-Fasatlah (2015) on the gifted students of King Abdullah II School of Excellence in Jordan to determine the level of gifted students in problem-solving skills, the study results showed that their problem-solving skills level is average; this level is not suitable for the abilities of gifted students. This study's result is consistent with Ucar et al. (2017) study, aiming to examine the level of gifted students' problem-solving skills in gender and grade level. The results indicated that the level of gifted students' problem-solving skills was not high. The skill was not good enough as expected from gifted.

Besides, Dreeb (2014) in his study aimed at comparing the capabilities of ordinary and gifted students with lateral thinking and problem-solving skill. The study sample included 240 students from the fifth preparatory grade of ordinary and gifted students (110 male and 130 female). The students were classified into ordinary and gifted according to the schools to which they belong; the researcher used a side thinking test and a measure of problem-solving skills. Study results showed that the level of ability to solve problems among gifted students was moderate.

Also, Saygili (2014) study showed no statistically significant differences between gifted and ordinary students in this skill. Although previous studies showed the inadequacy of the ability to solve problems among gifted students in line with their capabilities; the results of the study of Mukhtar (2016), which aimed to identify creative thinking and its relationship to the ability of gifted students problem-solving skills showed that their ability was high in this skill. This study seeks to reveal the reason for the discrepancy in these results.

Although giftedness has a tremendous interest at the global, regional, and local levels, gifted students lack training programs. The researcher noticed that while he has been working in gifted education for two decades, the low level of creative thinking abilities (As creative thinking relies on an organized mental chain to reach authentic products) needs to be practiced and training (Singer & Singer, 2011). The weak ability to solve problems due to insufficient programs to train in these essential skills. The problem is not in creative students' presence but in creating the conditions and environment appropriate for creativity and resisting the deadly inhibitions of creative thinking skills (Al-shaya, 2019; Mukhtar, 2016). this interpretation supports the fact that failure to keep thinking abilities and not challenging students' abilities will lead to the disappearance or weakness of these skills, which made many researchers emphasize the importance of providing specialized training programs to develop the capabilities of teachers and students in general and gifted on creative thinking skills and the ability to Problem Solving. (Al-Hammoury, 2009; Al-Harthy, 2002; Costa & Kallick, 2003; Jarwan, 2007; Swartz & Barks, 2005).

Besides, there is a lack of studies to show the effect of demographic characteristics on creative thinking and solving-problem skills. With the importance of the surrounding environment and demographic characteristics of the capabilities of creative thinking and the ability to solve problems, most studies focused on gender (Several studies have compared the capabilities of male and female gifted students in thinking skills and creative thinking in particular, which causes enriching other demographic aspects such as the Impact of the parents' educational level, birth order, economic level, age, grade level, and other demographic characteristics), a few studies were exposed to the Impact of the educational level of the father and the mother, and born order on the capabilities of creative thinking for gifted children and the results

were conflicting in those studies (Abdeen, 2016; Jannad et al., 2013; Mohammed, 2017; Nooradden & Khamqani, 2016; Rafeeqa, 2014).

Although the studies that focused on demographic characteristics for gifted students are few, as Baza (2007), and Hein et al. (2014) mentioned, their results are conflicting whether in creative thinking abilities or in the ability to solve problems and therefore there is an urgent need to enrich the field.

From the studies reviewed above, several studies were conducted to find out the level of creative thinking of gifted students (Alhadabi & Alashwal, 2012; Aljanabi & Kareem, 2015; Aljohani, 2018; Alqaisi & Altamimi, 2015; Alrasheedy et al., 2015; Alsharqi, 2005; Anati, 2019; Ayasrah & Hamadne, 2010; Mukhtar & Fathi, 2015; Turkey, 2018) and the level of their ability to solve problems (Al-Fasatlah, 2015; Dreeb, 2014; Saygili, 2014; Ucar et al., 2017). Also, Many programs have been used to develop gifted students' ability to think creatively, such as studies of (Adam, 2017; Al-Shammary, 2013; AL-Twerqi & Mohammed, 2018; Aljezani & Wared, 2012; Alnajim, 2016; Amour, 2005; Andriani et al., 2017; Baseer, 2019; Rayyani, 2011; Takhayneh & Abu-Rayyash, 2018; Tarrad, 2012). Besides many studies have also been conducted to improve the ability to solve problems such as (Al-Barsan & Abed, 2010; Al-Khurasat, 2015; Arndt, 2009; Eroglu & Tanisli, 2017; E. Husain, 2017; Omran, 2014; Saleh, 2017; Yandari et al., 2019).

However, there is a lack of clarity about the effectiveness of the habits of mind on improving the creative thinking abilities and the ability to solve problems for gifted students in adolescence, which is a transitional stage between two different stages, as most of the studies were for age groups younger than the sample of this study and for students who were not classified as gifted. In order to invest the gifted abilities in

creative thinking and the ability to solve problems, this category must be equipped with the skills necessary for those skills and abilities. The development of a training program that develops students' skills in these important abilities will provide teachers with the appropriate environment for this important category and will provide a rich material for those working in the field of authorship to improve the quality of the curricula and include the Habits of mind as a major component of it. Besides, it will give gifted students confidence in themselves and invest their capabilities and will enhance parents' knowledge of the abilities their gifted children and enhances and develops those abilities.

After studying the literature review and within the limits of the researcher's knowledge, there is no study covering a training program based on the Habits of Mind to develop creative thinking abilities and problem-solving among gifted students in Jordan. This study involves experimental research to develop these skills. Besides, this study will provide valuable results for decision-makers in the Ministry of Education, curriculum authors, educational supervisors, school administrators, teachers, parents, and gifted students themselves. Moreover, the study also seeks to bridge the gap and establish a training program that aims to develop creative thinking abilities and problem-solving skills creatively within important part of the Jordanian society.

1.4 The Research Objectives

This study's main objective is to develop the Creative Thinking Abilities and Problem-Solving Skills among gifted students in Jordan. The following particular goals were drawn to attain the general objective:

- i. To design and develop a training program based on the Costa Model of Habits of Mind.

- ii. To examine the creative thinking abilities of gifted students in the experimental group and the control group in the pre-test.
- iii. To examine the problem-solving skills of gifted students in the experimental group and the control group in the pre-test.
- iv. To examine whether there is any significant difference in the creative thinking abilities of gifted students after the intervention compared to the pre-test.
- v. To examine whether there is any significant difference in the problem-solving skills of gifted students after the intervention compared to the pre-test.
- vi. To determine whether there is any effect of demographic characteristics on creative thinking abilities (Age, Birth Order, Class, Father's education level, Mothers' education level).
- vii. To determine whether there is any effect of demographic characteristics on problem-solving skills (Age, Birth Order, Class, Father's education level, Mothers' education level).
- viii. To examine the perception of the gifted students towards the Habits of Mind Program.
- ix. To examine the perception of the teachers of gifted students towards the Habits of Mind Program.

1.5 Research Questions

The following research questions were derived from the research objectives:

- i. How was the training program based on the Costa Model of Habits of Mind (H.o.M) designed and developed?
- ii. What are the Creative Thinking Abilities (C.T.A.) of gifted students in the experimental and control groups in the pre-test?
- iii. What are the Problem-Solving Skills of gifted students in the experimental group and control group in the pre-test?
- iv. Is there any significant difference in the Creative Thinking Abilities (C.T.A) of gifted students after the intervention compared to the pre-test?
- v. Is there any significant difference in the problem-solving skills of gifted students after the intervention compared to the pre-test?
- vi. Is there any effect of demographic characteristics (Age, Birth Order, Class, Father's education level, Mothers' education level) on creative thinking abilities?
- vii. Is there any effect of demographic characteristics (Age, Birth Order, Class, Father's education level, Mothers' education level) on problem-solving skills?
- viii. What is the perception of the gifted students towards the Habits of Mind Training Program?
- ix. What is the perception of the teachers of gifted students towards the Habits of Mind Training Program?

1.6 Research Hypothesis

The current study covers the following hypotheses:

- H₀₁: There is no significant difference in the creative thinking abilities of gifted students after the intervention compared to the pre-test.
- H₀₂: There is no significant difference in the problem-solving skills of gifted students after the intervention.
- H₀₃: There is no effect of age on creative thinking abilities among gifted students
- H₀₄: There is no effect of birth order on creative thinking abilities among gifted students.
- H₀₅: There is no effect of class (7th, 8th, 9th) grade on creative thinking abilities among the gifted students.
- H₀₆: There is no effect of a father's education on creative thinking abilities among gifted students.
- H₀₇: There is no effect of mothers' education on creative thinking abilities among gifted students.
- H₀₈: There is no effect of age on problem-solving skills among gifted students.
- H₀₉: There is no effect of birth order on problem-solving skills among gifted students.
- H₁₀: There is no effect of class (7th, 8th, 9th) grade on problem-solving skills among the gifted students.