# THE EFFECTIVENESS OF REFLECTIVE ENRICHMENT PROGRAM (REP) IN ENHANCING REFLECTIVE THINKING AND METACOGNITIVE SKILLS OF JORDANIAN GIFTED AND TALENTED STUDENTS (GTS)

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# THE EFFECTIVENESS OF REFLECTIVE ENRICHMENT PROGRAM (REP) IN ENHANCING REFLECTIVE THINKING AND METACOGNITIVE SKILLS OF JORDANIAN GIFTED AND TALENTED STUDENTS (GTS)

by

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# DEDICATION

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

" قُلْ إِنَّ صَلَاتِي وَنُسُكِي وَمَحْيَايَ وَمَمَاتِي لِلَّهِ رَبِّ الْعَالَمِينَ " (الأنعام۞ 122)

"Truly, my prayer and all my acts of worship, and my living and my dying are for

Allah [alone], the Sustainer of all the worlds" "al-An`am 6:162"

Firstly, and forever, I sincerely dedicate all my Life, my death, my mind, and my

heart to The Almighty Allah.

I dedicate my sincere loyalty to my first and best teacher, Prophet Mohammad, Peace

be Upon Him.

I dedicate this humble Scientific Effort to the springs of loyalty, affection and virtue,

namely my parents (My dear Father: Abdalsalam & My dear Mother: Sawsan) and

my dear brothers and sisters, who spared no effort in helping me during my study

journey.

I dedicate this humble Scientific fruit to my best loyal companion, my wife, Arwa,

who has always been there for me.

I specially dedicate this effort to my dear daughters Sawsan (Da'abool), Jana

(Ba'abool), Bana (Za'abool), and my Son Abdalsalam (3assool) who have been

sacrificing in their own time to my success.

**Radwan Abdalsalam Radwan AbuSaif**

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# LIST OF ABBREVIATIONS

CFS       Conceptual Framework of the Study
CR       Critical Reflection
E       Evaluation
GTS       Gifted and Talented Student
JMOE       Jordanian Ministry of Education
M       Monitoring
MSQ       Metacognition Skills Questionnaire
MT       Metacognitive Thinking
P       Planning
R       Reflection
REP       Reflective Enrichment Program
RT       Reflective Thinking
RTQ       Reflective Thinking Questionnaire
TFREP       Theoretical Framework of the Reflective Enrichment Program
U       Understanding

# LIST OF APPENDICES

# KEBERKESANAN PROGRAM PENGAYAAN REFLEKTIF (REP) DALAM MENINGKATKAN PEMIKIRAN REFLEKTIF DAN KEMAHIRAN METAKOGNITIF DALAM KALANGAN PELAJAR PINTAR CERDAS DAN BERBAKAT DI JORDAN

## ABSTRAK

Program Pengayaan Reflektif (REP), sebuah program pengayaan yang baru, telah dibina dan diuji dalam kajian ini untuk mengisi jurang penyelidikan mengenai intervensi yang melatih kemahiran berfikir aras tinggi di kalangan pelajar yang pintar cerdas dan berbakat (GTS) di Jordan. REP dibina secara khasnya untuk meningkatkan pemikiran reflektif dan kemahiran metakognitif dikalangan GTS. Penyelidikan ini mempunyai enam objektif kajian yang menguji keberkesanan REP dalam meningkatkan pemikiran reflektif dan kemahiran metakognitif, serta dimensi-dimensinya dikalangan GTS. Reka Bentuk Ujian Pra Ujian Pasca dan Kumpulan Kawalan dijalankan dalam kajian eksperimen ini. Reka bentuk kajian ini merangkumi kumpulan eksperimen (n=32) dan kumpulan kawalan (n=32). Kumpulan eksperimen telah melalui 24 sesi program REP manakala kumpulan kawalan pula menjalani aktiviti pengayaan secara tradisional. Pemikiran reflektif pintar cerdas dan berbakat diukur dengan Reflective Thinking Questionnaire (RTQ) manakala kemahiran metakognitif pula diukur dengan Metacognitive Skills Questionnaire (MSQ). Kedua-dua analisis deskriptif dan inferensi telah dijalankan. Keputusan Analysis of Covariance (ANCOVA) menunjukkan bahawa lima daripada enam hipotesis nul yang diuji telah berjaya ditolak. Dapatan kajian menunjukkan bahawa REP mempunyai kesan positif dalam meningkatkan pemikiran reflektif pintar cerdas dan berbakat secara keseluruhan [F $(2.37)$ = 32.56, p $(0.00)$ < 0.05] dan juga dari segi dimensi

pengetahuan [$F_{(2,38)} = 9.57$, $p$ (0.00) < 0.05)] dan aplikasi kemahiran tersebut [$F_{(2,36)} = 44.32$, $p$ (0.00) < 0.05)]. Untuk kemahiran metakognitif pula, REP dapat meningkatkan kemahiran metakognitif secara keseluruhan [$F_{(2,28)} = 11.76$, $p$ (0.00) < 0.05] dan juga dalam pengetahuan metakognitif [$F_{(2,32)} = 12.44$, $p$ (0.00) < 0.05)]. Hal ini menunjukkan bahawa REP tidak dapat meningkatkan regulasi metakognitif GTS [$F_{(2,24)} = 1.60$, $p$ (0.21) > 0.05] iaitu kemahiran mereka dalam merancang, memantau dan menilai proses pembelajaran kendiri. Kajian ini menyumbang kepada pendidikan khas di Jordan, khususnya dari segi latihan pemikiran reflektif dan kemahiran metakognitif dalam kalangan GTS dalam negara ini. Implikasi secara pendidikan dan teoritikal berserta cadangan untuk kajian masa depan turut dibincangkan dalam kajian ini.

# THE EFFECTIVENESS OF REFLECTIVE ENRICHMENT PROGRAM (REP) IN ENHANCING REFLECTIVE THINKING AND METACOGNITIVE SKILLS OF JORDANIAN GIFTED AND TALENTED STUDENTS (GTS)

## ABSTRACT

The Reflective Enrichment Program (REP), an entirely new enrichment program, was developed and tested in this study to fill in the research gaps on intervention that train higher order thinking skills among gifted and talented students (GTS) in Jordan. REP was designed specifically to enhance GTS' reflective thinking and metacognitive skills. This study has six research objectives that tested the effectiveness of REP in enhancing GTS' overall reflective thinking and metacognitive skills, as well as its dimensions. A Pre-test Post-test Control Group Design was carried out in this experimental study. The research design included an experimental group (n=32) and a control group (n=32). The experimental group has undergone 24 sessions of REP program while the control group experienced the traditional enrichment activities. Reflective thinking among GTS was measured by the Reflective Thinking Questionnaire (RTQ), while their metacognitive skills were gauged by the Metacognitive Skills Questionnaire (MSQ). Both descriptive and inferential analyses were carried out. The results of Analysis of Covariance (ANCOVA) showed that five out of six null hypotheses tested were rejected. The results demonstrated that REP has positive effects on GTS's overall reflective thinking [$F_{(2.37)} = 32.56$, $p_{(0.00)} < 0.05$] as well as in its knowledge [$F_{(2.38)} = 9.57$, $p_{(0.00)} < 0.05$] and application dimensions [$F_{(2.36)} = 44.32$, $p_{(0.00)} < 0.05$]. As for metacognitive skills, REP has significantly improved overall metacognitive skills [$F_{(2.28)} = 11.76$, $p_{(0.00)} < 0.05$] and metacognitive knowledge [$F_{(2.32)} = 12.44$, $p_{(0.00)} < 0.05$]. This suggests that

REP did not enhance GTS' metacognitive regulation [F (2.24) = 1.60, p (0.21) > 0.05)], which is their skills in planning, monitoring and evaluating own learning processes. This study contributes to special education in Jordan, particularly in terms of training of reflective thinking and metacognitive skills among GTS in the country. Educational and theoretical implications along with suggestions for future research were discussed in this study.

# CHAPTER 1

# INTRODUCTION

## 1.1    Introduction

For nearly a century, researchers in the special education field have emphasized the need for understanding, measuring, and improving reflective thinking and metacognitive skills of Gifted and Talented Students (GTS) to attain the desired levels in their skills (Gallagher, King, Suh, & Hargrove, 2019). Such emphasis also came from the consensus on the crucial need for a sustainable enrichment program to improve all the thinking skills of GTS to enable them to keep up with the emerging and rapid changes in this digital era (Saritepeci, 2017).

Countless efforts have been made to develop activities that could enhance the learning of GTS. However, most of these activities were not focusing on reflective thinking and metacognitive skills among GTS (Subotnik, Olszewski & Worrell, 2011). Existing enrichment programs for GTS are mostly limited to accelerating the progress of GTS, without advancing their reflective thinking and metacognitive skills. Reis and Renzulli (2004) posited that good enrichment programs for GTS should be constructed based on scientifically proven theories for enhancing the diverse abilities of GTS, rather than only limited to the acceleration of academic progress. For this reason, researchers h` ave been attempting to find out the enrichment programs that can offer significant gains in thinking skills of GTS. As of 2020, most of the enrichment programs for GTS around the world, and more especially in the Arab countries, were merely aiming at enhancing the academic side of GTS; very few of these programs focus on the development of reflective and metacognitive skills (Allen, Robbins, Payne & Brown, 2016).

In meeting the complex learning needs of the GTS, enrichment must focus on thinking skills (e.g., reflective thinking skill, metacognitive skills) within or outside classroom teaching. GTSs must be equipped with thinking skills that can be applied in the real-world and to solve daily life issues (Renzulli, Reis, & Shaughnessy, 2014), which include skills such as understanding, reflection and critical reflection (Ardelt, 2010). Such skills are pertinent for them to reach their fullest potential (Delisle & Lewis, 2003; Reis & Renzulli, 2004). Unfortunately, the focus of many schools has been largely on raising the academic achievement of GSTs, not on meeting the needs of their curios minds and developing their potentials (Ruf & Ruf, 2005).

Given today's classroom dynamics with various learners in one space and the responsibility to supply sufficient programming for all abilities (Reid, 2015), enrichment opportunities and programs for the majority of GTS have typically been offered outside the regular curriculum. The reason is that gifted learners need a wide range of experiences that are beyond the depth and breadth of the regular curriculum. Such programs should focus on individual talent development, and on providing GTS with more opportunities to gain authentic learning opportunities through self-directed learning (Gollan, 2014).

This means that GTS should acquire the knowledge and application of the metacognitive skills of planning, monitoring and evaluation so that they could attain the core benefit of the self-directed enrichment programs which may be provided to them (Reis & Renzulli, 2004). Notably, it is difficult to make differentiation for all gifted and talented learners in their original classes (Reid, 2015). As a result, many GTSs between the ages of 11 and 15 are identified as the most at-risk for designation adjustment issues in school (Bakar, Yazid & Ishak, 2014). Therefore, it is necessary

to provide them with sufficient enrichment programs to combat the potential underachievement due to the existing teaching and learning constraints in the regular classroom (Renzulli, Reis, & Shaughnessy, 2014). In Jordan, excellent and gifted student's educational development act, started in 1980's as general directions, then more commonly known in the educational applications in1990's, where it has become that all school boards should provide special education programs and services for the GTS, at least in the identifying and nomination of them, to be joined in their special programs prepared by the Ministry (Ministry of Education, 2001, p. 20).

Hence, the Reflective Enrichment Program (REP) developed for this study is aimed at enhancing adolescent GTS's knowledge and application of their reflective thinking and metacognitive skills, based upon a strong theoretical base, mainly from Dewey's theory (1896; 1916; 1917; 1927; 1933), Hulfish's principles (1926; 1953; 1953; 1961), Flavell's theory of metacognitive skills (1979; 1985; 2004), and Renzulli's principles on the enrichment method (1976; 1977; 2013; 2014) to enhance GTS's reflective thinking and metacognitive skills.

## 1.2    Background of the Study

The present efforts for enhancing the thinking skills of GTS are only an extension of a long history of theories and studies which have dealt with human abilities over the past decades (Sternberg & Davidson, 1986; Sternberg, 1988; Renzulli & Reis, 1994; Castleberg & Dunaway, 1999; Renzulli, & Renzulli, 2010; Zion & Mevarech, 2015; Finnan, 2018). Further, many findings of current researches on giftedness show that there is a need to focus on the development of enrichment and enhancement programs to strengthen GTS' thinking skills (Choy, Yim  & Tan, 2017; Finnan, 2018; Murphy, & Ermeling, 2016; Zion & Mevarech, 2015).

Edney (2009) and Harris (2001) indicated that the recorded history of the GTS education, there have been examples of environments that carefully keep an eye out of the GTS's progressing. Notably, most of the early civilizations tried to enhance the distinguished talents for the good of the of their civilizations. Greek scholars, for instance, wished to place the leadership of his ideal state in the hands of who would qualify for their high status by gaining the greatest measure of intellectual abilities and several outstanding skills.

Enrichment programs for GTS were common practice in the US school systems, the programs used widely in the renaissance and after renaissance period as appropriate methods for developing and enhancing the exposed talents. Some of those programs extensively used in art, music, and dance by the several summer programs, but most of those programs were for the academic issues (Wu, 2013).

Studies for enhancing giftedness and talents have been conducted in the last decade were as organized attempts to stimulate the thinking abilities of GTS. While the first widespread attention to the special needs of GTS in public schools probably identified as early as the beginning of the Sputnik era in the 20th century. Kauffman, Hallahan, Pullen and Badar (2018) indicated that although evidence of the interest which appeared in the establishment of special programs for GTS in the same century,

Equally, Taber (2011) indicated that the challenge made by the Soviets to the American progress in the scientific subjects has stimulated extensive method reform through fundamental employment by the National Science Foundation and by the American Office of Education. Notably, such efforts were not exclusively directed toward GTS, but the emphasis of major themes in these curricula, and the provision of

actual practice in doing research, fit well into the educational needs of gifted students (Kauffman et al., 2018).

The attention on the education of GTS dropped suddenly between the 1960 and 1970 when the attention of educators in the field poured into the student equity' issues. However, there was a continued attention in the education methods and strategies of GTS, largely due to the recognition of the need for a large and continuing support of highly talented individuals to maintain the leadership in higher education and the sciences into the twenty first century. Despite this attention, the supports for GTS at both, national and international societal levels, has often been among the uncertainties in both the educational setting and the society at large (Edney, 2009).

Aljughaiman and Ayoub (2012) discussed enrichment as an educational strategy for GTS. Enrichment program is an official education program carried out by public and private educational institutions and promoted by researchers to fulfil the needs of gifted students (Pawilen, & Manuel, 2018). For example, enrichment program of science for sixth grade developed by Alarfaj (2016) was one amongst the early programs in the Arab countries' educational context. These programs aim at enhancing the educational experience of the gifted students and increasing their interest in schooling. Studies show that enrichment programs in Saudi Arabia and other Arab countries have traditionally focused on developing the academic and mental aspects of students but have paid little regard to the practical aspects such as the thinking and learning skills, which are necessary for achieving success in confronting the problems of daily living (Ortiz, Duarte, Milla, Castro & Lefranc, 2018).

Another popular education enrichment model is The School Wide Enrichment Triad Model (SEM) developed by Renzulli and Reis (1994), which is a product of 15

years of research and field testing, that combines the previously developed Enrichment Triad and Revolving Door Identification Models. SEM has been implemented in school districts worldwide, and there have been extensive evaluations and research studies which supported the effectiveness of the model (Shaunessy et al., 2015), particularly in serving the high-ability students in a variety of educational settings and in schools that serve diverse ethnic and socioeconomic populations. Reis and Renzulli (2004)'s enrichment programs focus on the social and emotional development of GTS and their future possibilities. These programs are among the enrichment programs that focus on thinking skills.

Researchers such as Chang (2005) and Hattie (2009) pointed to the importance of the acquisition of metacognitive strategies and self-regulated learning by students. In regard to this, there are different methods to trigger thinking skills among gifted students (Heilat, 2017), but those that employ reflective and metacognitive strategies are still not available in the Arab world and Jordan.

Zohar and Barzilai (2013) have conducted a review of research on metacognition in science education, and they found that to increase gifted students' thinking skills, teachers can employ the following: (a) prompts, (b) reflective writing, (c) practice and training, (d) teacher-led discussions, (e) student-led discussions, (f) explicit instruction, (g) Information and Communication Technology (ICT) based instruction, (h) concept mapping and other visual representations, and (I) modelling. Gifted students are instructed to follow these practices, but they often fail to do so. This is due to a lack of motivation because they do not see any benefit from the use and development of metacognitive strategies (Kienstra, Imants, Karskens & Van der, 2015).

To date, there are very limited studies on the enrichment programs for GTS in the local context. In one of the available studies, Al-Zoubi (2014) investigated the effects of enrichment programs on the academic achievement of gifted and talented students, and the results were positive. The enrichment programs have improved the gifted students' creative thinking skills. Somehow, despite the positive findings, the enrichment programs were not specifically focusing on reflective thinking and metacognitive abilities.

Conducting an empirical study on how to enhance the GTS's thinking skills is crucial (Kettler, 2014), especially on the development of enrichment programs for GTS for enhancing reflective thinking and metacognitive skills (Xie & Sharma, 2011). According to Choy, Yim & Tan (2017) reflective thinking has received less attention in the literature. Furthermore, even though there were studies on the concepts of reflection, understanding, contemplation, concerning, concentrating, and reflective strategies or thinking, only a few of them were conducted on students. For instance, a study by Murphy and Ermeling (2016) was focusing on how teachers could use different pedagogical approaches to develop thinking skills among students. The focus of the study was not on students.

In general, literature reviews show that there is a lack of enrichment programs on reflective thinking and metacognition skills of GTS. These literature gaps provide rationales for the development of enrichment programs in Jordan particularly, and in Arab region generally. The programs should focus on nurturing and enhancing the development of reflective thinking and metacognition of GTS (Murphy & Ermeling, 2016). Researchers asserts that these programs are more most critical for gifted students in the secondary school level as this is the time in which students are

developing many types and skills of thinking (e.g., Van Loon, 2018). In fact, these programs could become a preventative measure for the potential of decline in giftedness while also improving the creative thinking skills of gifted students (Van Loon, 2018).

Enrichment Programs which focus on high thinking skills can help in boosting GTS's cognitive capacity, equipping them with application skills of the gained skills, and how to keep and enhance their potentials (Ahmed, Galib, Zaman & Sarowar, 2018; Sreekara, Ratnam, Rajyalakshmi and Manupati, 2018; Ortiz et al., 2018). Further, the reflective Enrichment Programs can help GTS to 'think more about thinking,' engage actively in the learning processes, reflect more in projects or learning activities and be independent in learning (Ivančíková, 2013). Literature reviews show that experiential and hands-on activities in enrichment programs can also enhance the types and levels of reflective thinking and academic performance of gifted students (Amidu, 2012).

## 1.3    Statement of the Problem

The education policy in Jordan recognizes the special needs of gifted and talented students (GTS) and the importance of developing their potentials to the fullest. In this regard, efforts have been taken by the Jordanian Government to identify GTS in the country and to cater for their education needs. In Jordan, GTS received special education through dedicated Schools and Centres for GTS that offer academic and enrichment programs that fulfil their learning needs (Al-Zoubi, Rahman & Sultan, 2015). However, more emphasis was given to the academic component, which is inadequate in nurturing GTS potentials. This is because GTS' thinking skills, particularly Higher Order Thinking Skills (HOTs) need to be nurtured (Muil, Hussin, Mamat, Mohamed & Zailani, 2013). Among the important skills are reflective thinking

and metacognitive skills (De Jager, 2019), which are needed for learning and problem solving.

Miedijensky and Tal (2016) indicated that despite having high aptitudes and cognitive capacities, GTS often face difficulties in solving problems, self-reflection, and planning their own learning activities. They also face issues in some metacognitive skills, for instance, in monitoring their own learning activities. Godfrey, Lopez, Shimmel, Reuman and Anselmi (2014) pointed out that GTS are unaware of the importance and usefulness of self-reflective thinking and metacognitive skills, thus, they rarely engage in such mental activities. In specific, GTS are lacking in what psychologists known as declarative knowledge, procedural and conditional knowledge in higher order thinking skills. They have limited awareness and knowledge about thinking skills and do not know how and when to apply these skills (Godfrey et al., 2014). It is, therefore, important that trainings on thinking skills are provided to GTS through enrichment programs. Studies showed that GTS were not able to apply reflective and metacognitive skills because their knowledge of these skills were superficial or at the surface level (Mahasneh, 2013). This suggests that it is crucial for GTS to master both knowledge and application of these skills (Kienstra et al., 2015). However, at present, there is no available enrichment program in Jordan that focuses on training of reflective and metacognitive skills, particularly in terms of how to apply these skills effectively. This educational and research gap need to be addressed.

Without reflective thinking and metacognitive skills, GTS may face difficulties in learning, planning and monitoring their progress, which could lead to the problems of underachiever underachieving (Jarvis, Jolly & Moltzen, 2018). To avoid such issues, Taggart & Wilson (2005) stated that it is important to note that reflective

thinking and metacognitive skills do not develop naturally as students age, rather, they need to be developed systematically through enrichment programs or training. This call for the development a special enrichment programs to enhance GTS' reflective thinking and metacognitive skills.

There are very limited enrichment programs in the Jordanian context for enhancing reflective thinking and metacognitive skills. Most of the existing enrichment programs in the Arab context focus on the development of academic aptitude and analytical, creative, and practical abilities of GTS in other grade levels. For example, Al-Zoubi (2014) enrichment program was on the academic achievement of GTS, Aljughaiman, & Ayoub (2012) was on developing analytical, creative, and practical abilities of elementary GTS.

In other words, most available enrichment programs paid more attention to other performances and abilities of GTS not to the higher order thinking skills development (Potts, 2019). Even if thinking skills training is available, the enrichment programs often focus on training of other critical and creative thinking skills. There is a lack of focus on reflective thinking and metacognitive skills (Choy et al., 2017). The effect of these programs was not tested empirically as none of the past studies were intervention in nature (Freeman, 2002; Al-Zoubi et al., 2015; Al-Zoubi, 2014). Without evidence from empirical studies, none of the existing programs could validly claim its effectiveness on thinking skills of GTS. Most Jordanian GTS also did not realize the importance of reflection and metacognitive skills in planning, monitoring and evaluating skills their own learning activities, hence, may not be motivated to learn it (Kienstra et al., 2015). Any newly developed interventions should overcome these shortcomings by ensuring that students realize the importance and usefulness of the

skills and know when and how to apply it. It is crucial for students to acquire both knowledge and application of the thinking skills (Dewey, 1933; Genc, 2016). Unfortunately, there is limited enrichment programs in Jordan specifically, and in Arab region generally to fulfil the learning needs of GTS (Genç, 2016).

To fill in the literature and research gaps, there are needs to develop a Reflective Enrichment Program (REP) to enhance GTS' reflective thinking and metacognitive skills in Jordan. As mentioned above, REP is the first program in Jordan that aims to enhance two types of higher order thinking skills of GTS in the local context.  It is an original program as its focus (reflective thinking and metacognitive skills) is different from any of the existing program. The teaching and learning materials were also specifically designed for the use of Jordanian GTS.  In addition, the new program focus on both theory and application of the skills (Kienstra et al., 2015; Kember, 1999; Flavel, 1979), which has not done by any past studies in Jordanian context.  Nevertheless, since REP is a new program, its effectiveness in enhancing GTS' overall reflective thinking and metacognitive skills must be tested empirically. The effect of REP on GTS' knowledge on metacognition and how the students apply the knowledge to plan, monitor and regulate their learning, which is known as metacognitive regulation, must also be tested empirically.

**1.4 The Research Objectives**

This study aims to test the effectiveness of Reflective Enrichment Program (REP) in enhancing Reflective Thinking (Knowledge & Application) and Metacognitive Skills (Knowledge & Regulation) of the 9th grade GTS in Jordan. In specific, the study aims to achieve the following objectives:

1. To develop a Reflective Enrichment Program (REP) to enhance the reflective thinking and metacognitive skills of gifted and talented students.

2. To determine the effectiveness of REP in enhancing the experimental group's overall reflective thinking.

3. To determine the effectiveness of REP in enhancing the experimental group's reflective thinking knowledge.

4. To determine the effectiveness of REP in enhancing the experimental group's reflective thinking applications.

5. To determine the effectiveness of REP in enhancing the experimental group's overall metacognitive skills.

6. To determine the effectiveness of REP in enhancing the experimental group's metacognitive knowledge.

7. To determine the effectiveness of REP in enhancing the experimental group's metacognitive regulation.

### 1.5    The Research Questions

With the stated objectives, this study attempts to address the following questions:

1.  What are the activities and session in Reflective Enrichment Program (REP) to enhance the reflective thinking and metacognitive skills of gifted and talented students?

2.  Are there any differences in the post-test scores of reflective thinking between experimental and control groups?

3.  Are there any differences in the post-test scores of reflective thinking knowledge between experimental and control groups?

4.  Are there any differences in the post-test scores of reflective thinking application between experimental and control groups?

5.  Are there any differences in the post-test scores of overall metacognitive skills between experimental and control groups?

6.  Are there any differences in the post-test scores of metacognitive knowledge between experimental and control group?

7.  Are there any differences in the post-test scores of metacognitive regulation between experimental and control groups?

## 1.6    The Research Hypotheses

$H_{01}$:  There is no significant difference in the post-test scores of overall reflective thinking between experimental and control groups.

$H_{02}$:  There is no significant difference in the post-test scores of reflective thinking knowledge between experimental and control groups.

$H_{03}$:  There is no significant difference in the post-test scores of reflective thinking application between experimental and control groups.

$H_{04}$:  There is no significant difference in the post-test scores of overall metacognitive skills between experimental and control groups.

$H_{05}$:  There is no significant difference in the post-test scores of metacognitive knowledge between experimental and control groups.

$H_{06}$:  There is no significant difference in the post-test scores of metacognitive regulation between experimental and control groups.

## 1.7    Conceptual Framework

As mentioned in the introduction and statement of the problem, there have been no interventions aimed at enhancing reflective thinking and metacognitive skills among GTS in Jordan specifically, and in Arab region generally (Al-Zoubi, 2014; Yusof, Ishak & Zahidi, 2015; Al-Hajaya & Kraimeen, 2017). Hence, a conceptual framework is crucial to illustrate the main research idea and the association between the different concepts of this study. Figure 1.1 shows the Conceptual Framework of the Study (CFS) which contains two types of variables: the Independent Variable (IV) and Dependent Variables (DV).
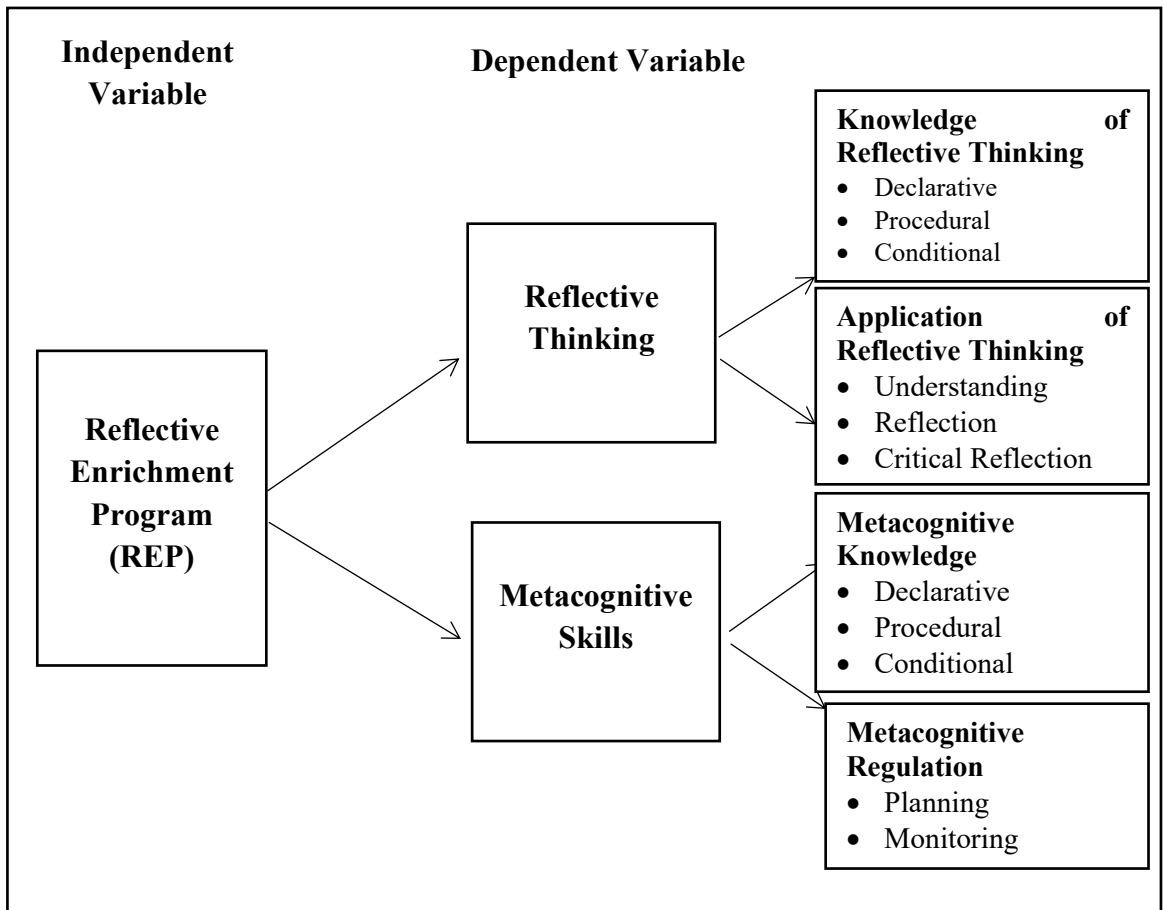
*Figure 1.1*. Conceptual Framework of the Study (CFS)

The independent variable refers to the manipulative variable in this experimental study namely the Reflection Enrichment Program (REP). REP aims to enhance reflective thinking and metacognitive skills among GTS in Jordan. The effects of REP have been tested on two separates dependent variables, namely reflective thinking, and metacognitive skills. Reflective thinking is made up of two dimensions namely reflective thinking knowledge (declarative, procedural, and conditional) and reflective thinking applications (understanding, reflection, critical reflection) (Kember, 1999). Metacognitive skills, on the other hand, is divided into two dimensions, namely metacognitive knowledge (declarative, procedural, & conditional knowledge) and metacognitive regulation (planning, monitoring & evaluating) (Flavel, 1979).

## 1.8    Significance of the Study

The significance of this study is in its attempt to enhance GTS who are considered as the future hope of Jordan. In particular, the significance of this study sprung from the enrichment program developed towards the enhancement of HOTS namely Reflective thinking and metacognitive skills. The newly developed enrichment program, the REP, may enhance GTS' knowledge and application of the skills, allowing them to become more efficient in learning and problem solving and reaching their full potentials (Genç, 2016).

An enhanced metacognitive and reflective thinking skills could benefit GTS greatly because these generic skills could be applied within and beyond the academic context. GTS can become more excellent and achieve greater success when equipped with these higher order thinking skills. As mentioned by (Whitebread, Coltman, Pasternak, Sangster, Grau, Bingham and Demetriou, 2009), a crucial step in moving students from being passive learners to active learners and to achieve the above objectives, in light of what pointed out by Fordham (2006) that instructors who are best equipped could show students how to learn the contents of their subjects. Moreover, to demonstrate the importance of the metacognitive awareness in learning, some studies, e.g., Meldrum (2000) examined students metacognition to identify the effective correlates of success in college anatomy and physiology. Hence, the newly developed Reflective Enrichment Program (REP) can help to strengthen gifted education and programs in Jordan, specifically in terms of enrichment programs. Specifically, REP could give benefits to institutions involved in gifted education. REP, if found effective, can be carried out as an enrichment program for gifted students in Jordan as well as in other Arab countries. The activities were designed for the local context and the program has been customized according to the learning needs of GTS

in Jordan, ensuring its suitability and sustainability in implementation. understand their role in the learning process is through metacognitive processes and active self-reflection.

The Jordanian Ministry of Education indicated that there are critical needs for research to focus on developing enrichment programs that could enhance GTS' higher order thinking skills, such as reflective thinking and metacognitive skills. This study fills in the research gaps by developing and testing the effectiveness of Reflective Enrichment Program (REP)- a program designed specifically for GTS in Jordan. The Ministry of Education in Jordan, through the Directorate of Special Education, is currently responsible for the education of students who are gifted and talented in the county. Special education has been established to provide educational programs for GTS. Unfortunately, these programs merely focused on academic needs rather than enrichment needs. Therefore, it is very significant in meeting the unique needs of GTS through customized enrichment programs. The training provided could prevent them from experiencing a variety of problems such as underachieving and help to them to achieve their personal needs (El-Zraigat, 2012).

In terms of instructional practices, REP also could be a handy tool for special education teachers. The lesson plans developed in this study could help teachers carried out enrichment activities to enhance GTS's reflective thinking and metacognitive skills. If REP is found to be an effective enrichment program, teachers of GTS should be trained to facilitate the implementation of REP as an intervention to enhance GTS's thinking and learning skills in Jordan.

**1.9      Limitation of the Study**

The limitations of this study could be determined as follow:

In this study, REP is specifically designed to fulfil the learning needs of GTS in Jordan. The intervention focuses on improving two types of higher order thinking skills, HOTS (reflective thinking and metacognitive skills). Hence, the findings may not be generalizable to other thinking skills (e.g., creative thinking skills). The effectiveness of REP must also be interpreted with cautions when apply outside the Arab regions, as the findings may not be generalizable outside this scope.

As the subject of this study only involved GTS at 9th Grade (14 years old), therefore, the findings for this study and intervention results may not be generalizable to younger or older students. This is because the development of metacognitive abilities among adolescents grows rapidly (Young, 2011), and thus, older and younger children may respond differently to the intervention.  In other words, the effects of REP may be different between GTS from different age groups.

**1.10      Definition of Terms**

This section covers the conceptual and operational definition of key terms used in this study, which are as the following:

**1.10.1  Reflective Enrichment Program (REP)**

Kim (2016) and Fiddyment (2014) considered that enrichment programs as the provider of exploratory activities, in-depth materials on a topic, materials for the development of the higher-level thinking processes and skills, self-selected independent projects, or authentic products or services for a real-world audience. Enrichment programs have emphasized the importance of profound knowledge and

skills within a subject to develop higher mental processes and creative production of students. Most previous studies searched the effects of various enrichment programs on the academic achievement, attitude toward the subject, and career-related motivation (Lee, Olszewski-Kubilius, & Peternel, 2010; Reis & Boeve, 2009; Walsh, Kemp, Hodge & Bowes, 2012).

The Reflective Enrichment Program (REP) developed in this study is an enrichment program has activities on knowledge and application of the reflection aiming at enhancing the reflective thinking and metacognitive skills of GTS. REP is an activity and a project-based intervention. Activities of this program are based on extensive literature and theoretical reviews (i.e., Renzulli, 1976; Zohar & Barzilai, 2013; Aljughaiman & Grigorenko, 2013; VanTassel & Stambaugh, 2018; Feldman et al., 2018; Temple, Ogle, Crawford & Freppon., 2005).

Those activities were: (a) prompts, (b) reflective writing, (c) practice and training, (d) teacher-led discussions, (e) student-led discussions, (f) explicit instruction, (g) ICT used instruction, (h) concept mapping and other visual representations and (i) modelling. As highlighted, many past programs failed to take into account student's knowledge in reflective thinking and metacognition (Kim, 2016; Plucker & Callahan, 2014). To overcome this shortcoming, REP emphasizes GTS's knowledge and application of reflective thinking and metacognition skills. Hence, the activities selected in this REP are well planned, purposeful and aim at enhancing the knowledge and application of reflective thinking and metacognitive skills.

In addition, REP is also developed based on the features of successful enrichment programs gleaned from the literature reviews (i.e., Renzulli, 1976; 1987; Sparks & Colton, 1991; El Demerdash, 2009; Griffin, 2003; Lee, 2005; Taggart &

Wilson, 2005; Ryan, 2011; Zohar & Barzilai, 2013; Aljughaiman & Grigorenko, 2013; VanTassel & Stambaugh, 2018; Feldman et al., 2018; Temple et al., 2005). In light of all mentioned above the REP is developed in this study, then validated (Appendix A: Content Validation Form for REP In English, Appendix B: Content Validation of REP In Arabic) to be the main tool of the study, which represent the independent variable of the study.

**1.10.2 Reflective Thinking**

Reflective thinking was highlighted by Dewey (1896; 1916; 1917; 1927; 1933) and Hullfish's model of reflective thinking (1926 - 1961) as an important higher order thinking skills. Kember (1999) have identified four constructs that cover a broad spectrum of reflective thinking. These comprise: (a) habitual action, (b) understanding, (c) reflection and (d) critical reflection. These constructs were derived from the extensive literature on reflective thinking, particularly the work of Mezirow (1990; 1991). Notably, habitual action encompasses "what has been learnt before and through frequent use becomes an activity that is performed automatically or with little conscious thought" (ibid, p.383). However, it lacks the elements of reflection; hence, this study will exclude habitual action and focus on three main dimensions of reflective thinking namely: (a) understanding, (b) reflection and (c) critical reflection.

In this study, reflective thinking will be measured using the modified Reflective Thinking Questionnaire (RTQ), originally developed by Kember (1999). The instrument is made up of 24 items and is divided into two parts. It is divided into three dimensions namely: (a) declarative knowledge (4 items), (b) procedural knowledge (4 Items) and conditional knowledge (4 items). The students' responses are

captured using a five-point Likert scale, which comprises the options of 'Never,' 'Mostly,' 'Sometimes,' 'Frequently,' and 'Always'. The second subscale (12 items) measures reflective thinking application. The items were taken from the original TRQ developed by Kember (1999). Reflective thinking application is measured by three dimensions namely: (a) understanding (4 items), (b) reflection (4 items) and (c) critical reflection (4 items). The responses are captured through a five-point Likert scale which comprises the options of 'Definitely Disagree,' 'Disagree,' 'Not Possible,' 'Agree,' and 'Definitely Agree'.

### 1.10.3 Metacognitive Skills

Schunk (2008) mentioned that John Flavell in the early 1979 was the first researcher of the term "metacognition", basing on the term 'metamemory' which previously conceived by Flavell (1979). Flavell in 1979 viewed metacognition as knowledge of learners in their own cognition, Flavell defined the metacognition as knowledge and cognition about cognitive phenomena. The metacognitive learner is thought to be characterized by their own abilities to recognize, plan, monitor, and evaluate, and, where needed, to reconstruct the existing ideas. This definition of metacognition by Flavell (1979) is adopted by scholars, often portraying different emphases or different understanding of mechanisms and processes associated with metacognition (Schunk, 2008). Schunk (2008) sees that metacognition referred in the literatures to the cognitions about cognitions, thinking about thinking. The skills of the metacognition relate to the awareness, control of the processes, and knowledge by the learners that they learn.

In this study, metacognitive skills will be measured using the modified Metacognition Skills Questionnaire (MSQ) originally developed by Okaza, Aluede and Owens (2013). MSQ in this study is made up of two subscales. The first subscale was developed by the researcher to gauge metacognitive knowledge. It is divided into three dimensions namely: (a) declarative knowledge (4 items), (b) procedural knowledge (4 items) and conditional knowledge (4 items). The students' responses are captured in a five-point Likert scale, which comprises the options of 'Never,' 'Mostly,' 'Sometimes,' 'Frequently,' and 'Always'. The second subscale (17 items) gauges students' metacognitive regulation, and this subscale is divided into three dimensions as follows: (a) planning (5 items), (b) monitoring (5 items) and (c) evaluation (7 items). The responses are captured in a five-point Likert scale, comprising the options of 'Never,' 'Mostly,' 'Sometimes,' 'Frequently,' and 'Always.

### 1.10.4  Gifted and Talented Students (GTS)

Gifted and Talented Students (GTS) refers to students with high performance capacity in intellectual, creative, artistic, leadership or specific academic fields and those who require special education in order to fully develop such capabilities (Jordanian Ministry of Education, 2009).  Renzulli and Reis (1985) proposed that GTS are those students who are possessing or capable of developing a composite set of traits and applying them to any potentially valuable area of human performance.

In this study, GTS refers to students with outstanding commitment to scholarship and are currently enrolling at Al-Jubilee Institute, and King Abdullah School. All Schools and Centers for Excellent or Gifted and Talented Students in Jordan are under the Jordanian Ministry of Education management. These GTS were

identified in all of these special Jordanian centers and schools based on IQ test. In this study, the samples in both schools of GTS had an IQ of 130 or more (Al Jabery & Zumberg, 2008; Shahin, 2010; Al-Srour & Al-Oweidi, 2016). Al-Jubilee School and King Abdullah II School are a governmental, residential, and coeducational secondary school that provides a 4-year program for outstanding students with a strong commitment to scholarship. They are 9th Grade gifted and talented students GTS in Jordan, with the average age of 14 years old.

## 1.11   Summary

Chapter One presents a brief background of Gifted and Talented Students (GTS) and the development of education for gifted students in Jordan. The lack of enrichment program to promote reflective thinking and metacognitive skills among GTS was highlighted in the problem statement. The issues discussed provide the rationales for the development of a Reflective Enrichment Program (REP), specifically to improve GTS' reflective thinking and metacognitive skills in Jordan. The significance of the study for different stakeholders was also discussed in Chapter One. In addition, the key terms were defined conceptually and operationally to help readers understand the constructs in this research.

# CHAPTER 2

# LITERATURE REVIEW

## 2.1    Introduction

This chapter details the theoretical and literature reviews covering the study terms. So, this chapter includes, firstly, a thorough review on GTS (gifted and talented students) and their educational needs. This chapter tries to read these needs, to be in line with the previous attempts towards enhancing their HOTS through a number of proposed programs. The present chapter covers the important underlying theories for the education of GTS and the theoretical framework of this study. This chapter provides an overview on the Higher Order Thinking Skills (HOTS) that are lacking among GTS, shedding some light on the knowledge and application dimensions of their reflective thinking and metacognition skills. This chapter attempted to read the results of most related previous studies that employed some activities aimed at improving one or both two types of HOTS. Finally, the theoretical framework for this study is presented at the end of the chapter.

## 2.2    Historical Overview of Gifted and Talented Education

According to Van Loon, 2018 and Folsum (2006), gifted and talented education became a recognized field during the 1920s, whereby in the end of the 1920s and during1930s, a progressive innovation against the traditional learning led the whole education. During this period, John Dewey then Leta Hollingworth, with the association with the Teachers College and Columbia University, attempted to reveal the cohesions in educational practice that could be existed in general education and special education for GTS.