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The Effects of a Cognitive Acceleration Training Program on Developing the Emotional Intelligence among a Jordanian Sample of Sixth Graders

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Abstract
The aim of this study is to investigate the effects of a training program based on Adey and Shayer Model of Cognitive Acceleration on developing the Emotional Intelligence (EI) among a Jordanian sample of sixth graders in UNRWA schools. To achieve this aim, the sample of the study consisted of (121) female and male students selected purposively from Al-Amir Hasan Preparatory School (males) and Al-Amir Hasan Preparatory School (females) in Zarqa Area. This sample of male and female students is divided into experimental and control groups. The training program was applied to the experimental group. In order to measure the impact of the training program, the Emotional Intelligence Test (EIT) was administered to both groups as a pre- and post-test at the beginning and at the end of the implementation of the program. Results of the study demonstrated that there were statistically significant differences at ($\propto \leq 0.05$) in favor of the experimental group in the performance of the students on the EIT attributed to the group. However, the study showed that there were no statistically significant differences at ($\propto \leq 0.05$) in their performance on the EIT attributed to gender. Finally, the results indicated that there were statistically significant differences at ($\propto \leq 0.05$) in the interaction between the training program and gender. The study concluded with recommendations related to applying the idea of the training program used in this study in developing the Emotional Intelligence and conducting further studies to develop other types of intelligences.
Keywords: cognitive acceleration, Adey and Shayer, emotional intelligence, UNRWA schools.

Introduction

The world is changing nowadays at an accelerated pace, and the pressures are increasing to respond to these rapid changes. Accordingly, the world we live in requires continuous learning and reconsidering the decisions we take (Paul & Edler, 2002). In this context, education plays a vital role in developing human societies through enhancing the intellectual abilities for reasoning, analysis, and perseverance on lifelong learning, which is highly related to cognitive development (Shayer & Adey, 2002). In spite of the differences among scholars and researchers on the mechanisms of cognitive development, there are many facts and generalizations that most of them agreed on, and the most important of them is that cognitive development occurs as a result of internal and external factors which are characterized by being dynamic and reciprocal, and it occurs in a social context that includes changes in the way of representing information (Bjorklund, 2011).

McCormack (2009) suggests that the belief that prevailed in the late seventies of the twentieth century on the non-effect of the educational interventions on the cognitive development does not enjoy absolute acceptance. However, the initial studies conducted by a team of Chelsea College showed success that encourages the idea of cognitive acceleration which from Adey and Shyer's views focuses on increasing the pace of natural thinking development among students.

Theoretical Background

The purpose of cognitive acceleration is to increase the ratio of semi-abstract and abstract thinking which become possible according to Piaget between 14-15 years old (Adey & Shayer, 2002). The idea of cognitive acceleration is based on the works of Piaget and Vygotsky (Adey, 1999). The first cognitive acceleration program was developed by Michael Shayer, Philip Adey, and Carolyn Yates in 1981, and relied in its original version on Piaget's theory of cognitive development. The outcome of this program was a package of (30) lessons entitled "Cognitive Acceleration through Science Education" (Serret, 2004).

The origins of this model go back to the works carried out in Chelsea College, which showed that many concepts in science require demands that exceed students' current mental abilities. According to the thinking styles described by Piaget, a team of researchers developed a tool to analyze the cognitive requirements and a group of cognitive development tests which were used in a wide survey study to identify the level of students' thinking at

different ages. The result revealed differences between students' thinking styles and curricula requirements (Adey, 1999).

Shayer & Adey (2002) state that there are three basic assumptions on the interventions of cognitive accelerations, summarized as follows: (1) the programs used in these interventions are appropriate based on some general mental functions through an independent context or within a specified study content (2) These functions develop during the transition from one stage to another, and (3) The development of these functions is affected by environment and maturation.

The primary principles of Adey and Shayer's model are (Shayer & Adey, 2002):

1- **Concrete preparation**: Students need initial introduction to any intellectual problem they face as they need to recognize the context of the problem and some vocabularies in order to discuss it. Therefore, the first stage in cognitive acceleration is designed to involve students in the task.
2- **Cognitive conflict**: This principle uses the idea of Piaget and Vygotsky on the equilibrium and the zone of proximate development where equilibrium from Piaget's view represents a process where the cognitive processing mechanisms adapt with events that cannot be represented directly and create some conflict. While the zone of proximate development from Vygotsky's view refers to the difference between what can be achieved by the child without assistance and what could be achieved with others' assistance.
3- **Social construction**: Vygotsky proposes that constructing knowledge and understanding are mainly a social process, where understanding appears in the social environment of learners. Piaget confirms that the social environment which creates the cognitive conflict and stimulates the cognitive development is not less important than the physical environment.
4- **Metacognition**: Vygotsky stresses the importance of language as a means of learning and that meaning is not the only thing that constructed when children interact among themselves or with adults. Language also provides tools for thinking. The idea of meta-cognition focuses on the value of developing thinking through the individual's awareness of his/her thinking and through developing vocabularies which are considered crucial to describe the different tools of thinking.
5- **Bridging**: This principle refers to providing new thinking processes through a wide range of contexts, where students are requested to think in other contexts that use these schemas.

The important corner stone of this model is derived from the theory of schema proposed by the Swiss psychologist Jean Piaget who defines the schema as "a general way of thinking that may be used in different contexts." The early works of cognitive acceleration used the schemas of abstract operations as described by Piaget, and the most important of them are: controlling variables, equilibrium, probabilities, and abstract modeling (Shayer & Adey, 2002). The cognitive acceleration as described by Adey & Shayer (2010) includes intervention programs that cover a wide range of ages and subjects that could be offered in different levels of focus in terms of content and the extent of application. They propose three common characteristics of the cognitive acceleration programs: (1) challenging students' thinking (2) focusing on the social construction and understanding, and (3) encouraging and enhancing opportunities of meta-cognition.

Literature Review

Many studies have addressed cognitive acceleration, one of them was a study carried out by Mousa (2002) to explore the effects of using Adey and Shayer's training program on the achievement and accelerating of the 1st secondary students' mental development in Oman Sultanate. The sample of the study was selected from two classes: one of them represented an experimental group of (41) students, while the other represented the control group of (40) students. The results revealed significant differences in favor of the experimental group on abstract thinking and academic achievement.

Mbano (2003) investigated the impact of a cognitive acceleration program on the performance of secondary school students in Malawi. The age of the study sample ranged between 16-17 years. The findings showed significant differences in favor of males of the experimental groups in physics, biology, English, and mathematics while female students of the experimental group excelled their peers at the control group in physics only.

Saleh (2005) conducted a study to investigate the effect of a training program of cognitive acceleration on developing the cognitive development among sixth graders in Gaza. The sample of the study consisted of (331) male and female students distributed into an experimental group of (170) students and a control group of (161) students. The results of the study showed significant differences between the mean scores of the two groups in favor of the experimental group on the cognitive development scale.

Gallagher (2008) investigated the impact of a teaching program based on cognitive acceleration on improving thinking among a sample of 4 to 6 year old children. The study sample consisted of (44) participants of a basic school in Ireland; (20) of them represented the experimental group and (24) students represented the control group. The results revealed that the students of the experimental group improved significantly in thinking compared to those of the control group.

Mustafa (2012) conducted another study to investigate the effects of a training program based on Adey and Shayer cognitive acceleration model on developing the critical thinking and the successful intelligence among a sample of fifth graders in Jordan. The sample of the study consisted of experimental and control groups of (128) male and female students. The results revealed significant differences between the mean scores of students of the experimental and control groups in favor of the experimental group, and they also revealed significant differences on the critical thinking scale between males and females in favor of males. However, the results revealed no significant differences attributed to gender on the successful intelligence scale.

The emotional intelligence has been given great importance in recent years not only in education but also in all areas of modern life as well. It is considered an indicator of the success of individuals to understand their feelings and how they manage their emotions to be able to interact with others to achieve their goals (Goleman, 1995). Scientists have begun attempts to understand human intelligence in more depth at the beginning of the twentieth century when Binet developed a test to measure intelligence and applied it to school students in France to determine the differences between the ordinary and non-ordinary students to place them in special classes. After several years, he developed with Simon the first test to measure cognitive intelligence, which was used largely all over the world. However, some scientists realized early the presence of non-cognitive aspects of intelligence, and on top of them was Thorndike, who proposed in 1920 three types of intelligence, among them the social intelligence which was identified by him as the ability to understand people. Then came Wechsler in the fourth decade of the last century and confirmed that the non-cognitive elements in the intelligence are as important as cognitive elements (Black, 2003).

The educational literature points out that intelligence quotient (IQ) has been used for a long time to predict school success, but late last century and the beginning of the 21st century witnessed a shift supported by research which showed that emotional intelligence is better able to predict the success of the school than traditional measures of cognitive intelligence, and scientists become more convinced that success is attributed to what exceed the general intelligence (Lawrence & Deepa, 2013; Buvoltz, Powell, Solan, & Longbotham, 2008). And nearly three decades ago, Howard Gardner's ideas about multiple intelligences led a generation of educators to go beyond the narrow idea of IQ that prevailed widely in the twentieth century, and emphasized the importance of non-compliance of contemporary schools by the narrow concept of intelligence and the transition to a wider range that includes seven intelligences which later became eight (Goleman, Barlow, & Bennet, 2010).

Goleman (1995) introduced a new important dimension of intelligence through the publication of the book titled *Emotional Intelligence,* which became one of the main topics of concern in the psychological circles. Despite the great interest in this new idea; literature shows that scientists have studied this structure during long periods in the 20th century and the historical roots of this broad scope can be traced back to the nineteenth century (Bar-On, 2006). However, the emotional intelligence is considered a revolution in analyzing human thoughts and emotions. The Emotional Intelligence Theory provided new paths to distinguish between intelligent and non-intelligent people using a wide range of intelligence scales. This theory emerged during the 1970s and 1980s through the work and writings of psychologists such as Gardner (1983) and Salovey & Mayer (1990). Overall, it can be said that the seeds of emotional intelligence appear more clearly in the theory of multiple intelligences (Hejazi, Al-Sayyed, & Hamdar, 2012).

The concept of emotional intelligence is considered relatively one of the recent concepts in the fields of psychology and intellectual measurement and there has been no consensus on a specific definition for this new term so far. Mayer and Salovey used the term emotional intelligence for the first time in (1990) and considered it a form of social intelligence (Zaza, 2010). Salovey & Mayer (1997) presented the concept of emotional intelligence through connecting emotions with intelligence in a model that captures the emotional life of the individual and others. Accordingly, Salovey & Mayer (1990) defined emotional intelligence as “An individual's ability to succeed in coping with environmental requirements, its pressures, controlling his feelings, monitoring the feelings of others, differentiating between positive and negative impacts of these feelings, and using the emotional information to guide his thinking and actions.”

Salovey & Meyer (1997) added that emotional intelligence is one's ability to recognize, understand, self-organize and express his/her feelings in dealing with others. Goleman (1995) defined emotional intelligence as “The individual's ability to understand his feelings, listen to others, feel with them, and express their feelings in a productive way. This intelligence includes controlling self-desires, postponing satisfying them, monitoring the mood of others and separating between feelings and thinking” (Ioannidou & Konstantikaki, 2008). Weisinger (2000) proposed that emotional intelligence is “The intelligent use of emotions.”

Goleman (1995) identified five skills and abilities of emotional intelligence: (1) self-awareness or possession of a realistic assessment of the self-feelings (2) self-regulation or management of emotions in an appropriate manner leading to help the individual and not to hinder him (3) motivation or self- inspiration (4) empathy or the ability to achieve awareness of the feelings of others and (5) social skills or ability to deal with others in an appropriate manner.

Bar-On (1997) developed an expanded model of emotional intelligence and proposed a definition of this term as

"A range of possibilities and cognitive skills that affect an individual's ability to cope with the demands of life and its pressures." This model was classified into fifteen components classified into five domains: (1) intrapersonal (2) interpersonal (3) adaptation (4) stress management (5) and general mood. While Salovey & Mayer (1990) focused on the mental abilities, Bar –On stressed the non-cognitive ones.

Behnke & Greenan (2011) pointed out that the emotional intelligence is a measure of the individual's ability to use the acquired knowledge, abstract thinking, and problem-solving to interpret and guide the personal responses in internal and external settings. In this context, Goroshit & Hen (2012) viewed the emotional intelligence as a crucial component of the individual's adaptation, well-being, and the overall success in life. Boyatzis (2006) added that emotional intelligence produces better results when it is connected with the fields of work and academic performance.

Among the studies that addressed emotional intelligence is a study undertaken by Al-Jundi (2006) to identify the differences in emotional intelligence between gifted and normal students. To achieve the objective of the study a sample was selected randomly from ninth, tenth and eleventh graders. The number of participants is (420) students equally distributed between two schools in Amman. The results of this study revealed significant differences between the mean scores of gifted students and the mean scores of normal students in favor of the gifted students.

Abdullat (2008) carried out another study to explore the effects of a program based on Goleman's theory on improving the academic and social adaptation and the attitudes of talented students toward school. The study sample consisted of (60) tenth graders at King Abdullah II Center for Excellence. The study results showed significant differences in the performance of experimental and control groups on the scales of academic adaptation, social adaptation, and the attitudes towards the school in favor of the experimental group. However, the results showed no significant differences between the two groups attributed to the interaction between gender and the training program.

Jarwan and Kammor (2008) designed a counseling program based on Golman's theory of emotional intelligence to investigate its impact on decreasing the aggressive behaviors among a sample of 8^{th} and 9^{th} graders in Amman. The sample consisted of (60) male and female students who were selected from (950) students. The results of the study showed significant differences in favor of the experimental group attributed to the counseling program and gender in terms of the aggressive behaviors in favor of males. While the results did not reveal significant differences attributable to the interaction between gender and group for aggressive behaviors and negative attitudes toward school.

The literature review on cognitive acceleration based on Adey and Shayer model shows that there is an interest in these programs in the domains of academic achievement, cognitive abilities, and some of the variables such as successful intelligence, reflective thinking, and achievement motivation. While the studies on the emotional intelligence focused on the impact of emotional intelligence's training programs on some variables; the current study which addresses the effects of a cognitive acceleration training program based on Adey and Shayer model on the development of emotional intelligence might be- to the researchers' knowledge- one of the few Arab studies that have investigated this effect.

Problem Statement

Cognitive development is considered a key pillar in the development of abstract thinking. That's why scientists have exerted great efforts in searching for mechanisms to accelerate this development due to its importance. Adey and Shayer's model in its original version has proven its effectiveness on improving academic achievement and some types of intelligence. However, there has been a need to investigate the effectiveness of other programs based on this model in accelerating other types of intelligence such as emotional intelligence. Nowadays emotional intelligence enjoys the interest of educators and that of other scientists and researchers due to its effect on the adaptation of the individual and his ability to balance his life. It is also important in the process of predicting the chances of success in various fields. Hence, the problem of the current study focuses on investigating the impact of a training program based on Adey and the Shyer's model on the development of emotional intelligence among a sample of Jordanian sixth graders.

The Hypotheses of the Study

The current study investigates the following main question: Is there a significant statistical difference at level ($\propto \leq 0.05$) of a training program based on Adey and Shyer's cognitive acceleration model on emotional intelligence among a sample of 6^{th} graders at UNRWA schools in Jordan? The following sub-hypotheses emerged from this main question:

1- There are no statistically significant differences at level ($\propto \leq 0.05$) between the mean scores of the students of the experimental and the control groups on the emotional intelligence scale attributed to the proposed training program.
2- There are no statistically significant differences at level ($\propto \leq 0.05$) between the mean scores of the students

of the experimental and the control groups on the emotional intelligence scale attributed to the gender (males or females).

3- There are no statistically significant differences at level ($\propto \leq 0.05$) between the mean scores of the students of the experimental and the control groups on the emotional intelligence scale attributed to the interaction between the training program and the gender (males or females).

Procedural and Theoretical Definitions

1- Training program: A training content includes activities for cognitive acceleration in accordance with the experimental foundations based on Adey and Shyer's model (Mustafa, 2012).
2- Cognitive Acceleration: The increase of natural development of thinking abilities through the developmental stages to achieve advanced developmental cognitive stages (Adey, 1999).
3- Emotional intelligence: A system of self and social emotional abilities that affect the general ability of the individual to adapt to the requirements of the environment and its pressures (Jarwan, 2012). Procedurally, it is the score attained by the respondents on the emotional intelligence scale used in this study.

Significance of the Study

The significance of this study stems from addressing the application of Adey and Shayer's model of cognitive acceleration in developing the emotional intelligence of a sample of students in the Jordanian education system. Previous studies did not explore the relationship between cognitive acceleration and emotional intelligence. The theoretical and practical significance of this study lies in the added value of the findings related to cognitive acceleration through the training program based on Adey and Shayer's model. Moreover, the emotional intelligence skills that the training program might develop are considered highly important to assist students in the interaction and adaptation with their environments, and that, in turn, is expected to affect their academic achievement positively as well. In this context, Fernandez-Berrocal (2008) suggests that gaps in emotional intelligence skills affect students adversely inside and outside the school. He argues that emotional intelligence is a crucial element in educational systems, and that most parents consider mastering these skills a priority in their children's personal and social development. In addition, the study may enhance educators' and researchers' knowledge and experience in the domain of cognitive acceleration and its relationship with emotional intelligence. More and above, the study has an important effect in stimulating more research on cognitive and emotional development.

Limitations of the Study

The outcomes of this study may be generalized in light of the following limitations:

1- The study sample was restricted to a sample of students from four classes of 6th graders at UNRWA schools in Jordan for the scholastic year (2012/ 2013).
2- The results of this study are linked to the concept of emotional intelligence adopted by the current study and the scale used to measure it.
3- The results of this study are linked to the training program that has been developed based on Adey and Shayer's model of cognitive acceleration and the way of using it.

Methodology and Procedures

Population:

The study population included all students of 6th graders at UNRWA schools in Zarqa Area. The schools that have the sixth grade in this area are (30) schools, among them (15) schools for males and (15) for females. The total number of the study population was (2499) students, (1312) males and (1187) females. The study sample was selected from the 6th graders in Al-Amir Hasan Preparatory Boys' and Girls' schools run by UNRWA (United Nations Relief and works Agency for Palestine Refugees in the Near East) in Zarqa Education Area. The number of students in these two schools is (121) students. One of the two male classes at the school was selected randomly to select the experimental group while the control group was selected from the other class of the school. For considerations of applying the scale and the training program, (33) students responded from the control group and (28) from the experimental group. Therefore, the number of male students after the application of the training program and the scale is (61) students in the experimental and control groups. As for the females sample, it was selected from Al-Amir Hasan Preparatory Girls' School which includes two classes with (60) female students. For considerations of applying the scale and the training program, (29) students responded from the control group and (31) from the experimental group. Therefore, the number of female students after the application of the training program and the scale is (60) students in the experimental and control groups as shown in Table (1).

Table 1: The distribution of the study sample according to group and gender variables

Group/Gender	Males	Females	Total
Experimental	28	31	59
Control	33	29	62
Total	61	60	121

Study Instruments

The study used the following tools:

1. Emotional Intelligence Scale

The scale used in this study is Bar-On for children and youth. This scale is applied collectively and it measures five domains: Self-efficacy, social efficacy, stress management, general mood, and adaptation. These domains comprise (15) sub skills and abilities. The scale includes (60) items appropriate for the ages from 8 to 18 years old.

Scale Validity and Reliability

Bar-On and Parker, the authors of Bar-On scale, cited in the scale guide statistical tables of data taken from the sample (n = 9127), and the results showed that the correlation coefficients between the four dimensions ranged between low and medium. On the other hand, it was high between these two dimensions and the total score, which supports the theoretical foundation upon which the scale was built, through incorporating differentiated domains. To verify the construct validity, the authors cited correlational data about the relationship between the performance on the scale and other measures of emotional intelligence, the relationship between it and the basic scales of personality, and the varied scales of internal and external, and behavioral problems internal and external. The results showed significant correlation coefficients that validate the scale (Bar-On & Parker, 2000).

The reliability coefficient of the original version of the scale was calculated by using the test-retest method with an interval of three weeks. The scale was applied on a sample consisting of (60) males and female students of children and adolescents, (27) males and (33) females, of (13.15) average age. The reliability coefficient using this method ranges between (0.77-0.89) and the internal consistency coefficient for the same sample was calculated using Cronbach Alpha formula; the reliability coefficient ranges between (0.82-0.90) (Bar-On, 2000).

The Validity and Reliability of the Jordanian Version of the Scale:

Al-Jundi (2006) translated the scale into Arabic in cooperation with some specialists in English language teaching, and then it was translated back into English for matching purposes between the first and the second translation of the scale items. The scale was assessed by a committee of judges from Amman Arab University and Petra University. As a result of their observations some paragraphs were modified while the total number of the items remains (60) classified into the aforementioned five domains. The reliability of the scale was confirmed using the test-retest method using a sample of (60) students from a private school in Amman. The reliability coefficients of the different domains using Pearson formula ranged between (0.84-0.95). However, the reliability coefficient of the internal consistency using Cronbach Alpha formula was calculated through the same sample and it showed that the reliability coefficient ranged between (0.74-0.86).

To confirm the validity of the tool, it was refereed by five teaching staff at the Faculty of Educational Sciences and Arts, specialists in educational psychology, and as a result of their evaluation some items were modified linguistically. The scale maintains the (60) items distributed among the same five domains of the original scale and the Jordanian version. For confirmation purposes, the reliability coefficient was calculated using a sample of (33) students from the same school and level beyond the experimental and control groups. The reliability coefficient using Cronbach Alpha between the two halves of the scale was (0.878) and the reliability coefficient was corrected using Cronbach Alpha with Spearman-Brown formula of the scale as a whole to become (0.935) which is considered very high.

2) **Training Program**

Before starting the development of the training program used in this study, the related literature and concepts associated with it have been reviewed within the limits of the availability of references and related studies. This training program is based on the Adey and Shayer model of cognitive acceleration which emerged from the cognitive theories of Piaget and Vygotsky. The general framework of the model includes five steps: (1) Concrete preparation (2) Cognitive conflict (3) Social construct (4) Meta-cognition, and (5) Bridging. This training program consists of (15) sessions of two class periods each of which addresses one of the life concepts in different areas appropriate to 6th graders level such as: culture, development, citizenship, pollution, and belonging. These concepts were presented to males and females in separate classrooms according to the aforementioned steps as proposed by Adey and Shayer by a teacher who received proper training to implement the training program.

The Aim of the Training Program

This training program aims to develop the emotional intelligence which includes the following five domains: Self-efficacy, social efficacy, stress management, general mood, and adaptation.

Expected Outcomes

This training program is expected to achieve the following outcomes:

1- Promoting students' awareness of new concepts and life skills so that they can use them in dealing with others, increasing their interest in learning, and addressing the problems they encounter in their daily lives.
2- Developing the ratio of the abstract and semi-abstract thinking of students.
3- Empowering students to use a variety of skills to develop their emotional intelligence.

The Requirements of Implementing the Training Program

The training program of this study was developed in a simple language free of vague terms so that it can be used by educators after providing them with training materials needed, regardless of their specialty or academic background. However, it is believed that acquainting these educators with a theoretical foundation about the cognitive acceleration model of Adey and Shayer may help to implement this training program more effectively and efficiently.

Implementation Procedures and Strategies

Each session includes the following procedures:

1- Concrete preparation of the lesson by showing images to reflect the general idea of the lesson and constitute an interesting introduction for students.
2- Discussing the images contained in the boot and asking deep and probing questions about them.
3- Preparation of a working paper including activities that address the topic and the cognitive processes related to the session.
4- Distribution of the working paper on the groups of students.
5- Providing students with the appropriate support during working out the activities.
6- Focusing on asking questions that provoke students' thinking and encouraging them to clarify their answers, interpret their thinking processes, and control them.
7- Transferring knowledge and applying it on other learning settings.

It is worth noting here that these steps are not separate and may be overlapping during the application. The sequence of steps is to help organize the learning situation. Moreover, it provides a general framework for the lessons of cognitive acceleration model as proposed by Adey and Shayer. The sessions of this training program includes schemas that represent the characteristics of abstract thinking, among them: modeling, compensation, balance, probabilities, reasoning, and thinking about abstract concepts. Several strategies were used in implementing this training program, including: dialogue, discussion, questions, collaborative work, worksheets, working in groups, and homework.

Evaluation of the Training Program:

The effect of the training program was evaluated as follows:

1- Applying the emotional intelligence test before and after the implementation of the training program.
2- Observing students' behavior and learning processes during the training sessions.
3- Self-reported sheets filled by the students about their impressions and attitudes towards the different aspects of the training program.
4- Individual and group meetings with students who are participating in the training program to investigate their views about the training program and its effectiveness.

Study Implementation Procedures:

The researchers followed the following procedures in implementing the study:

1- Preparation of the study tools: These include the emotional intelligence scale and the training program based on Adey and Shayer's model.
2- Selection of the study sample of 6th graders from Al-Amir Hasan Preparatory Girls' School and Al-Amir Hasan Preparatory Boys' School.
3- Identification and distribution of the study subjects into two control groups for males and females and two experimental groups for males and females randomly.
4- Implementation of the emotional intelligence scale on the experimental and control groups before implementing the training program on the experimental groups.
5- Implementation of the training program on the experimental groups (males and females).
6- Implementation of the emotional intelligence scale on the control and experimental groups (males and females) after implementing the training program.

Study Design and Statistical Treatment

This is a quasi-experimental study which includes the following variables:

1- Independent variables: (a) Training program (b) Gender with two levels (males, females).
2- Dependent variable: Emotional intelligence.
3- The researchers used the following statistical treatments: (a) The means and standard deviations to test the study hypotheses (b) ANCOVA to compare between the means.

Results and Discussion

The results related to the first hypothesis: "There are no statistically significant differences at level (∝≤0.05) between the mean scores of the students of the experimental and the control groups on the emotional intelligence scale attributed to the proposed training program". To test the first hypothesis, the mean scores of the students of the two groups on the emotional intelligence scale were calculated. Table (2) shows these results.

Table 2: The mean scores of the students of the two groups on the emotional intelligence scale

Group	Number	Means	Standard Deviation	Modified Mean	Standard Error
Experimental	59	189.37	17.75	188.64	2.82
Control	62	158.50	30.61	159.20	2.75

The results in table (2) show apparent differences at level (∝≤0.05) between the mean scores of the students of the experimental and control groups on the emotional intelligence. ANCOVA was used to determine the significance of these differences between the mean scores; table (3) shows these results.

Table 3: ANCOVA results to compare between the mean scores of students of the two groups on the emotional intelligence scale

Source of Variance	Sum of Squares	Degree of Freedom	Mean Squares	F value	Significance
Pre test	20092.915	1	20092.915	42.843	0.000
Group	26113.117	1	26113.117	*55.680	0.000
Error	55340.382	118	468.986		
Total	104247.901	120			

Significant at level (∝ ≤ 0.05)

This result, as shown in table (3), reveals significant statistical differences at level (∝ ≤ 0.05) between the mean scores of students of the two groups on the emotional intelligence scale, where F value equals (55.680) at significance level (0.000). As for the modified mean scores in Table (2), it is clear that the differences are in favor of students of the experimental group. This refutes the first hypothesis. Accordingly, the results show that there are significant statistical differences at level (∝≤ 0.05) between the mean scores of the experimental and the control groups on the emotional intelligence scale attributed to the proposed training program of cognitive acceleration. This result may be attributed to the impact of the proposed training program on stimulating and enhancing students' thinking which led to promote student' thinking to higher and advanced levels.

The result may also be attributed to the multiplicity of the training situations included in the cognitive acceleration lessons and the learning situations that enhance thinking in supportive, interactive and social contexts. These situations have been marked by close attention to students' daily lives and their great ability-as observed through the training sessions- to stimulate students' motivation to address the different activities included in the training program. This result may be attributed as well to the contents of the lessons of the training program which comprises various concepts of life covering areas of social, economic, political and cultural challenges cognitively and emotionally pushes students to interact with these concepts and problems contained therein and developing their ability to control their feelings, develop their ability in managing their emotions, and enhancing self-confidence through the positive psychological and social environments that marked the training sessions.

Adey (2010) supports the importance of the comfortable climate created in the classroom through cooperative learning that enhances the critical thinking and positive discussions in an atmosphere that respects the contributions of students and different expectations. This result coincides with the results of some previous studies cited in the current study in terms of the positive impact of training programs based on the model of Adey and Shyer on some of the variables addressed in these studies, such as: Mustafa (2012), Saleh (2005), and Gallagher (2008).

The results related to the second hypothesis: " There are no statistically significant differences at level (∝≤0.05) between the mean scores of the students of the experimental and the control groups on the emotional intelligence scale attributed to the gender (males or females). To test the second hypothesis, the means scores of the students of the two groups on the emotional intelligence scale were calculated. Table (4) shows these results.

Table 4: The mean scores of the students on the emotional intelligence scale according to gender variable

Gender	Number	Means	Standard Deviations	Modified Mean	Standard Error
Males	61	180.03	24.61	175.94	3.44
Females	60	166.97	32.61	171.13	3.47

Table (4) reveals apparent differences at level ($\propto \leq 0.05$) between the mean scores of the students on the emotional intelligence according to the gender variable, to determine the significance of these differences between the mean scores, ANCOVA was used. Table (5) shows the results.

Table 5: The results of ANCOVA to compare between the mean scores of the students on the emotional intelligence scale according to gender

Source of Variance	Sum of Squares	Degrees of Freedom	Means of Squares	F value	Significance Level
Pre test	18261.081	1	18261.081	26.661	0.000
Gender	630.711	1	630.711	0.921	0.339
Error	80822.787	118	684.939		
Total	104247.901	120			

Table (5) shows that there are no statistical significant differences at level ($\propto \geq 0.05$) between the mean scores of the students on the emotional scale according to gender, where F value equals (0.921) at significance level (0.339), leading to accepting the second hypothesis, which means that there are no statistical significant differences at level ($\propto \leq 0.05$) between the means of the 6th graders performance who exposed to the proposed training program attributed to gender on the emotional intelligence scale.

This result may be attributed to the nature of the training program which does not take into consideration any differences between males and females in terms of its content or application. Furthermore, the way of managing the training sessions by the same teacher does not distinguish between males and females in terms of the friendly climate which dominated the classroom life throughout the duration of implementing the training program. This result could also be attributed to the social environment students live in, which does not differentiate between the two genders in terms of methods of socialization. Moreover, this result may be attributed to the widespread modern communication media that contributes to bridging the gaps between males and females, and paves the way for close aptitudes and acquiring the emotional intelligence abilities. The result of this study confirms results of the previous study (Mustafa, 2012), while it differs from other studies (Gallagher, 2008; Mbano, 2003).

The results related to the third hypothesis: "There are no statistically significant differences at level ($\propto \leq 0.05$) between the mean scores of the students of the experimental and the control groups on the emotional intelligence scale attributed to the interaction between the training program and the gender (males or females)" . To test the third hypothesis of the study the mean scores of the students on the emotional intelligence scale according to the interaction between the group and the gender were calculated. Table (6) shows these results.

Table 6: The mean scores of students on the emotional intelligence scale according to interaction between group and gender variables

Group	Gender	Number	Means	Standard Deviation	Modified Mean	Standard Error
Experimental	Males	28	192.39	18.84	186.19	4.05
	Females	31	186.65	16.54	190.91	3.79
Control	Males	33	169.55	24.27	167.60	3.63
	Females	29	145.93	32.57	149.58	3.90

The results shown in table (6) reveal apparent differences between students' mean scores on the emotional intelligence scale attributed to the interaction between the group and gender variables. To determine the significance of the differences between the means, ANCOVA was used. Table (7) shows these results.

Table 7: The results of ANCOVA to compare between the means of the students on the emotional intelligence scale according to interaction between group and gender variables

Source of Variance	Sum of Squares	Degrees of Freedom	Means of Squares	F value	Significance Level
Pre test	16305.384	1	16305.384	37.802	0.000
Group	26878.468	1	26878.468	*62.315	0.000
Gender	1192.445	1	1192.445	2.765	0.339
Group x Gender	3853.990	1	3853.990	*8.935	0.003
Error	50034.436	116	431.331		
Total	104247.901	120			

Significant at level ($\propto \leq 0.05$)

The results shown in table (7) indicate that there are significant statistical differences at level ($\propto \leq 0.05$) between students' mean scores on the emotional intelligence scale attributed to the interaction between the group and the gender variables, where F value equals (8.935) at level (0.003), which leads to refuting the third hypothesis, which means that there are significant statistical differences at level ($\propto \leq 0.05$) between the means of 6th graders who were exposed to the proposed training program attributed to the interaction between the program and gender on the emotional intelligence scale.

This result may be attributed to the fact that the mean scores of female students of the experimental group are better than the mean scores of the male students of the experimental group on the same group, while the mean scores of the male students of the control group are better than the mean scores of the females of the control group on the emotional intelligence scale. Perhaps this interference, led to the interaction of a part of the training program in a manner that different between males and females in the experimental and control groups. This result differs from the result of the previous study (Abdullat, 2008) cited in the current study.

Finally, we could conclude that Adey and Shayer model may contribute to developing a new vision in developing the emotional intelligence. However, it must be recognized that this model is still at the beginning of the road, especially in the Arab world, and it will not be in the short-term an alternative to other models. The transition to this form from science, where it was born to other areas, although it has already begun but the completion is still in need of further research and experimentation.

Recommendations

In light of the results of this current study the authors recommend the following:

1- Adopting the training program used in this study as one of the possible options to develop emotional intelligence among 6th graders.
2- Using the idea of this training program and its main principles in conducting more research studies about developing other types of intelligence among different categories of sudents.
3- Conduting further research studies using cognitive acceleration in different domains to develop other types of thinking, intlligence, and concept development.

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