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An Evaluation of Learning Outcomes of Summer Enrichment Gifted Programs in Saudi Arabia

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Abstract: Two studies were conducted to explore the effects of summer enrichment gifted programs on some cognitive and affective learning outcomes in Saudi Arabia. The primary purpose of the first study was to investigate how the program affects attributional styles and decision making skills in gifted students. With 63 10th graders gifted students (38 males, 25 females), results appeared that, with respect to attributional styles, the program had significant effect on attribution to effort dimension. With respect to decision making skills, there were significant effects on avoidance, self- concept, and panic dimensions. In study 2, the focus was on the effects of the program on actively open-minded thinking, autonomy and future time prospective. Only 18 gifted students of those participated in the study 1 talked part in study 2. The results revealed that there were significant effects on dogmatic thinking with respect to actively open minded thinking; emotional autonomy and functional autonomy with respect to autonomy; and extension and connectedness with respect to future time prospective. In general, results revealed that summer enrichment gifted programs had significant impacts on cognitive and affective outcomes of gifted students who took part in such programs.

Key words: Gifted program evaluation, Outcomes of gifted programs, Autonomy, Actively open-minded thinking, Future time prospective.

1. Introduction

During the last ten years, educational authorities in Kingdom of Saudi Arabia have begun to provide enrichment programs for gifted and talented students, especially in science, mathematics and information technology subjects. These programs offer educational services which extend beyond the traditional curriculum. Such increasing concern with the gifted programs made decision makers question about the outcomes of these programs. Now, ten years have over since beginning of the implementation of summer enrichment programs in Saudi Arabia. Very limited scientific evaluation studies of these programs have been conducted (Aljughaiman et al., 2009; Al-Qarni, 2010; AlQahtani, 2009). However, a review of evaluation reports available about these programs revealed that they only focused on evaluating the quality of services provided without assessing their cognitive and affective learning outcomes of the participating students.

Reviewing a number of studies on evaluation of gifted programs' outcomes (Aljughaiman et al., 2009; Delcourt, Cornell, & Goldberg, 2007; Goldring, 1990; Kulik & Kulik, 1987, 1991) revealed that such studies focused mainly on investigating effects of gifted programs on academic achievement as cognitive learning outcomes. Motivation, self-concept and students' attitude toward learning have been also studied as affective learning outcomes. Despite that the summer enrichment gifted programs emphasized the academic subjects; they did not introduce such subjects as extension of the academic subjects matters. Emphasis of academic gifts, their thinking and personal skills.

Rogers (2002) asserted that keeping balance between cognitive and affective outcomes was critical to gifted education program

development. All recent models of giftedness assert that giftedness is a composite of interactive cognitive and affective factors (e.g., Renzulli, 2003, 2005; Heller, Pertel, & Lim, 2005; Gagne, 2003, 2005; Ziegler & Stoeger, 2007). Based upon this perception of giftedness, the current researchers conducted this longitudinal study over two consecutive years to come to grips with the cognitive and affective learning outcomes of summer enrichment gifted programs conducted in Saudi Arabia. During the first study, we investigated the effects of a summer enrichment gifted program on attribution styles and decision making skills. In the second study, the actively open-minded thinking as a cognitive outcome, autonomy and future time prospective (FTP) of Saudi gifted students were explored.

Significance of the current study stems from the fact that it attempts to pinpoint the importance of taking into account cognitive and affective constituents in the design and evaluation of gifted education programs; as review of enrichment gifted programs reveals that such program mainly emphasize cognitive learning outcomes, and ignore the affective ones that impact in one way or another the development of giftedness. Focus of this study such summer enrichment programs were on developing participating students' on variables not adequately treated in the field of gifted programs adds to its significance; the question of actively open-minded thinking entails important dimensions related to intellectual flexibility. Such dimensions seem to be independent of general intellectual ability (Stanovich & West, 1997, 2007; West, Toplak, & Stanovich, 2008). Moreover, autonomy as an important cognitive outcome is important not solely to gifted education but to education in general (Hughes, 2003). Attribution styles used by students to interpret their successes or failures, decision making skills and their perceptions of the future, and willingness to compromise the present in order

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to shape better future are considered critical to success in practical and academic life (Husman & Shell, 2008).

2. Literature Review

Over the last three decades, a substantial body of research has investigated the cognitive and affective outcomes of a range of gifted programs which have grouped students of similar ability in a variety of subject areas (Hertzog, 2003; Hébert & McBee, 2007; Johnson, Johnson, & Maruyama, 1983; Kulik & Kulik, 1987, 1997; Rogers 1991, 2002; Slavin, 1988). Research consistently shows measurable academic gains for gifted students across all subject areas, particularly, when the grouping is fulltime, and when the curriculum is differentiated in pace and depth to meet the students' characteristics (Goldring, 1990; Kulik & Kulik, 1987, 1991; Page & Keith, 1996; Vaughn Feldhusen, & Asher, 1991). Comprehensive review of the research on ability and achievement grouping of gifted students have been made by Gross (1993), Kulik and Kulik (1992, 1997), Benbow (1998) and Rogers (2001).

In their meta-analytic study of findings of nine experimental investigations of gifted students who participated in pullout programs compared to gifted students in regular programs, results showed that participation in pullout programs had positive effects on high ability students with respect to school achievement, critical and creative thinking (Vaughn et al., 1991). Results of a study by Delcourt et al., (2007) revealed that achievement scores of gifted students who joined special gifted education programs were higher than gifted students in regular school gifted programs.

Neber and Heller (2002) conducted an evaluation of summer-school program for highly gifted secondary-school students in the German student academy. The findings indicated that the program contributed to promoting motivational and cognitive prerequisites for transforming giftedness into excellent performances, and made it clear that the positive effects on students' self-efficacy and self-regulatory strategies were due to qualities of the learning environments established by the courses.

In Saudi context, Aljughaiman and his colleagues (2009) investigated the affective learning outcomes of gifted education programs carried out by the Ministry of Education in the Kingdom of Saudi Arabia. Moreover, results of that study showed that gifted education programs implemented in elementary schools made significant effects on participating students with respect to creative thinking skills, academic achievement, motivation, and attitude towards learning.

Reviewing studies carried out in this regard appears that researchers repeatedly focus on a number of variables and goal orientation (Bloom, 1985; Dai, Moon, & Feldhusen, 1998; Feldhusen et al., 1990; Joswig, 1996; Vlahovic-Stetic, Vidovic, & Arambasic, 1999). Findings of a number of studies asserted that homogenous ability grouping of gifted

including intrinsic motivation, self-concept, locus of control, students had positive impact on their motivation and attitude toward learning, and helped gifted students develop realistic self-concept (Aljughaiman, 2009; Borland, Horton, & Subotnik, 2002; Fiedler, Lange, & Winebrenner, 2002; Roger, 2001, 2004; Tieso, 2005).

The current study will focus on different and important variables that researchers have not been investigated in the field of gifted program evaluation. These variables are; attributional styles, autonomy, decision making, future time perspective and actively open-minded thinking.

3. Attribution Styles

Reasons people give for an outcome, such as success or failure in a task, are called attribution. This concept have captured increasing attention in the field of gifted education (e.g., Campbell, Tirri., Ruohotie, & Walberg, 2004; Nokelainen, Tirri, & Merenti-Valimaki, 2007; Vlahovic-Stetic et al., 1999). Researchers in the field of education have become very much interested in attribution styles due to its relevance to students academic achievement in various school stages (Bridges, 2001; Houston, 1994; Weiner, 1986, 1992, 2000).

Weiner (1992) proposed three dimensional attribution model that explained reasons individuals use to interpret their successes or failures. These dimensions are: (a) internal- external attributions which refer to within or outside the individual causes; (b) stable-unstable attributions which refer to consistent or inconsistent causes over time; (c) controllable-uncontrollable attributions which refer to the extent one belief s/he has control over the cause of an outcomes. Furthermore, in his study Weiner introduced four factors most individual attribute to them their successes or failures. Such factors are: ability, effort, task difficulty and luck.

The present study focused only on within-person factors (ability and effort), as they have frequently been found to be the most stated reasons for success and failure in achievement context (Nokelainen et al., 2007).

Relevant research points out that attribution to effort tended to be unstable but controllable, whereas attribution to ability was usually stable but uncontrollable (Houston, 1994; Weiner, 1992). Dweck and Leggett (1988) stated that gifted students who attributed their success to ability, blamed their personal ability when they fail; as they believed the sense of achievement was something one had or had not as internal stable attribution. Campbell (1995) stated that high achieving students needed to have: ability, system, confidence, and good work habits. Therefore, that some gifted students attribute success to high efforts might indicate that learning tasks were extremely difficult. Such high level difficulty of the learning tasks made students feel that either great efforts were needed to accomplish such difficult tasks, or more support is needed for them to prove that they were able to succeed.

4. Decision Making

Decision making can be defined as the process of choosing a course of action from among two or more alternatives while in the midst of pursuing one's goals (Byrnes, 1998). Educators have become increasingly concerned about adolescents' decision making due to increasing problems facing them (DiClemente, Hansen, & Ponton, 1995). Several models or theories interpreting decision making process have been developed (Goldstein & Hogarth, 1997). Some of the earliest models were based on the assumption that an optimal decision could be arrived at in a very rational thinking. However, regardless of the way one use to make a decision, it appears that decision making process includes

psychological and value conflicts. The individual's tension and/or anxiety may rise, because any decision that individual makes to solve a problematic situation may not secure approval of all persons concerned. Hostie (2001) points out that the decision making process itself, coupled with the pressure of the problem situation, cause a state of tension and uncertainty regardless of decision making styles adopted by the individual. In this context, Mellers, Weber, Ordóñez, and Cooke (1995) assert that one's emotions strongly impact the decisions he/she makes, and that consequences of such decisions strongly influence the person's emotions in return. Positive emotions, as Isen (1993) points out, increase the individual's ability to solve problems creatively. On the contrary, negative emotions lead to lack of attention and failure in looking for new alternatives (Fiedler, 1988).

Janis and Mann (1977; Mann, Harmoni, & Power, 1989) developed a model that demonstrates the impact of psychological tension on the quality of decision making, and the behavior of avoiding to make decisions by some people under certain circumstances. When individuals make decisions they tend to deal with their psychological tensions in different ways such as: fear of failure, feeling worried due to unknown consequence of their decisions, and losing self-respect and respect by others if wrong decisions were made. Such model includes five main dimensions: Self-confidence, Vigilance, Panic, Evasiveness and Complacency. Those dimensions were classified by Janis and Mann into two categories, 'adaptive' and 'maladaptive' decision making patterns. An adaptive pattern is carefully deliberated behavior, such as vigilant and self-confident decision making. A maladaptive pattern fails to meet many of the requirements of high quality information processing, such as panic, evasiveness, and complacency. As this model is psychologically built, we found it is suitable to use in the current study.

5. Actively Open-minded Thinking

Baron defines Actively Open-minded Thinking (AOT) as "the willingness to search actively for evidence against one's favoured beliefs, plans or goals and to weigh such evidence fairly when it is available" (2002, p. 1). It refers to the disposition and ability to avoid such bias; to search actively for evidence against views one already accepts and to weigh such counterevidence fairly. People usually tend to think in ways that favor their own point of views. This bias in thinking has been found across a wide variety of reasoning tasks, age groups and intelligence levels (See Stanovich & West 1997; Stanovich et al. 1999). Discussions on critical thinking consistently pinpoint the importance of decontextualized thinking styles that assess evidences and viewpoints of individuals irrespective of their previous personal beliefs (Stanovich & West, 1997; Zechmeister & Johnson, 1992).

AOMT is frequently considered as a core component of critical thinking as well as a vital characteristic of the critical thinker (Nickerson, 1987, Baron 1991, 1994, Voss, Perkins & Segal, 1991, Johnson & Zechmeister 1992, Kuhn 1991; Sá, Stanovich, & West, 1999). Critical thinking is a collection of skills and dispositions which include the skills of argument analysis (detecting, clarifying and analyzing the structure of arguments, and logical inference. It is clear that the disposition to impartially seek out evidence that might contradict a favored opinion is a basic component of the critical thinking. Accepting others' viewpoints, recognizing one's wrong opinions, and interpreting evidences according to personal preferences are important

characteristics of critical thinking (Nickerson, 1987; Norris & Ennis, 1989; Stanovich & West, 1997; Zechmeister & Johnson, 1992). In their investigation of one's previous beliefs on assessment of viewpoints, Stanovich & West (1997) found that previous beliefs of the individual actually impact the process of thinking.

Stanovich (2009; Stanovich & West, 1997) reports that the distinguish between the cognitive ability and thinking disposition toward thinking carried out by psychologists is like that between algorithmic and rational level of analysis carried out by computer scientists. Cognitive abilities refer to type of cognitive processes investigated by information processing scientists who are seeking to underlying cognitive basis of performance on IQ tests such as perceptual speed, discrimination, accuracy, and working memory capacity. In contrast, thinking dispositions are viewed as more malleable cognitive styles. It is believed that we cannot expect to improve cognitive capacities very much through teaching. By contrast, thinking dispositions are expected to be much more malleable (Baron 1991, 2002, Stanovich and West 1997). Hence, we have chosen to use these dispositions in the current study since enrichment programs are expected to lead to a significant improvement in the skills of critical thinking

6. Autonomy

Autonomy is considered a main goal in gifted education as well as in public education (e.g., Betts, 1992, Betts & Kercher, 1999; Hughes, 2003; Renzulli & Reis, 1997). Many studies emphasized the importance of autonomy in the adolescence stage (Ryan, 1995; Baltes & Silverberg, 1994; Collins & Repinski, 1994; Koestner & Losier, 1996; Silverberg & Gondoli, 1996).

There are two types of autonomy: (1) Logical autonomy which focuses on development of logical thinking, and (2) Personal autonomy which focuses on development of self-awareness. Allen (1992) views personal autonomy as an issue of emotional maturity, self-dependence, ability of the individual to regulate his/her life affairs, and independence of others in taking charge of personal responsibilities. Some researchers use the concept of self-governance to refer to autonomy (Fenner, 2003; Hughes, 2003; Mele, 1995). Self-governance embodies a number of positive characteristics related to self-dependence such as self-confidence and self-sufficiency. Noom, Dekovica, & Meeus (1999) suggested three dimensions of autonomy that were: (1) Attitudinal Autonomy that refers to that individual's understanding of his/her personal goals through opportunities and desires; (2) Affective Autonomy that refers to the individual's understanding of his/her autonomy through self-confidence; and (3) Functional Autonomy that refers to the individual's understanding of strategies needed for self-regulation and control. In another relevant study, Noom et al., (1999) asserted this theoretical structure of autonomy.

7. Future Time Prospective

The concept of future time prospective refers to the person's beliefs and orientations toward the future with regard to long range goals (Husman & Lens, 1999; Husman, Smith, & Johnson, 2001). Future time prospective is the most common concept in cognitive and affective research investigating the future in the fields of psychology, sociology and education (Carstensen, Isaacowitz, & Charles, 1991; Husman & Shell, 2008; Simons, Vansteenkiste, Lens, & Lacante, 2004; Zimbardo & Boyd, 1999). Research on the mental representation of the future has increased recently

(Bembenutty & Karabenick, 2004; Levy & Earleywine, 2004; Husman & Shell, 2008; Malka & Covington, 2005; Suddendorf & Busby, 2005). It seems that researchers in various psychological fields agree that adolescence stage is critical to the development of the future identity of individuals (Kerpelman & Mosher, 2004), and that mental representations of the future have great effect on students' motivation during late adolescence stage (Malka & Covington, 2005).

Students' perception of the future influences their cognitive and motivational beliefs, and their academic goals (Kauffman & Husman, 2004). The experimental evidence in the educational context reveals that students' learning motivation and self-regulation are influenced by their understanding of the future (Husman., McCann, & Crowson, 2000; Husman & Lens, 1999; Miller & Brickman, 2004; Simon et al, 2000).

Husman & Shell (2008) have investigated the dimensions of future time perspective that include: (1) Valence which involves that individuals are attracted to certain things or goals based on the value or significance placed on such things or goals that could be achieved in the future; (2) Extension which refers to the extent the individual is able to list his/her ideas in a plan; (3) Speed which refers to precise planning of the future and the need for external organization to manage incoming events, and (4) Connectedness which refers to the individual's ability to make connections between current activities and future goals.

Related literature cited in this study revealed the theoretical and practical significance of investigating certain variables as important learning outcomes pertaining to education in general and gifted education in particular. Furthermore it seemed evident that, variables investigated in relevant research cited in the present study had influenced the present and future learning behavior of students.

Study 1

This first of two studies was conducted during the summer of 2008. This study aimed at deciding on the effects of summer enrichment program on the attributional styles and decision-making skills of gifted students. In the light of the study's goal, quasi-experimental design was used. Questions investigated in this stage were:

- 1) What was the effect of a summer enrichment gifted program on attribution styles of participating students?
- 2) What was the effect of a summer enrichment gifted program on decision making skills of participating students?

8. Method

8.1 Participants

The sample of the study involved 63 gifted students (38 males and 25 females) chosen from amongst the population of secondary-school science students. Selection of the sample of the study was based on a set of criteria including: (a) being among the top 5% in the ability test designed for the Saudi secondary students, (b) academic achievement above 95%, (c) academic achievement in mathematics above 95%, and (d) a distinguished academic fulfillment in a given area.

8.2 Instruments

Attribution Styles Scale. Researchers used the 18- item attribution

scale developed by Nokelainen et al, (2007). Responses of the students on the items are scored using from 1 (strangely disagree) "to 7 (strongly agree). The scale was translated into Arabic using the prescribed procedure for this purpose, with native speakers and both forward and backward translations. To verify the scale's factorial constructive validity, a factor analysis was conducted on scores of 200 grader 10th secondary students. Results revealed that students attributed their successes to: (1) *effort* with (8) items counting for 21.57% of the total variance, and (2) *ability* with (5) items counting for 17.21%. Cronbach's alpha reliability for these dimensions were: (0.83) for attribution to effort factor, and (0.72) for the attribution to ability factor. Such results were similar to findings of previous research (Campbell, 1996a, 1996b; Feng, Campbell,. & Verna, 2001; Heller & Lengfelder, 2000; Tirri, 2001).

Adolescent Decision Making Questionnaire ADMQ.

The decision making questionnaire for adolescents developed by (Tuinstra, van Sonderenm., Grooth, Van den Heuvel, & Post., 2000) is a self-report questionnaire consisting of 30 items. Respondents could mark one of the four responses to each item: `always' (scored 1), often' (scored 2) `sometimes' (scored 3), `never' (scored 4). The ADMQ was translated into Arabic using the prescribed procedure for this purpose, with native speakers and both forward and backward translations. A factor analysis was conducted on scores of 200 grader 10th secondary students. The principal component factoring with Varimax rotation yielded 4 dimensions: Avoidance, self-confidence, impulsivity, and panic. Cronbach's alpha reliability for these dimensions were (0.80) for avoidance, (0.84) for self-confidence, (0.70) for impulsivity, (0.71) for panic, and (0.81) for the scale as a whole.

8.3 Procedures

Four months a head of the program implementation, researchers organized a 5-day training to the staff of the program. This training involved: models of gifted programs, teaching gifted student, and evaluating gifted programs. Toward the end of the training program, researchers met with the implementation team members of the program and instructed them the idea of the study, and how and when to apply the research instruments. Quasi-experimental design was used. The pretest was applied on the participants two days ahead of the program implementation. Two weeks after the end of program, a posttest of the study's instruments took place. Participants responded electronically to the scales of this study.

8.4 Results

The effect of the program on attribution styles:

To explore effect of the program on the attribution styles of the gifted students in enrichment summer program, paired- sample *t*-test was used.

Table 1: *t*-test results of differences between pretest and posttest on attribution styles

Application	Dimension	M	SD	DF	<i>t</i>	Sig.
Pretest	Attribution to Effort	38.47	5.85	62	10.88	0.001
		42.84	4.50			
Posttest	Attribution to Ability	11.96	4.44	62	0.574	0.568
		11.80	4.24			

Table 1 shows that statistical significant differences at the significance level of (0.001) existed between students' mean scores of pretest and posttest applications concerning effort attribution style favoring posttest application. However, no statistical significant differences existed between students' mean scores of pretest and posttest applications concerning ability attribution style. Such finding indicated that the enrichment program had influenced the gifted students' beliefs about effort attribution, but it did not have any effect on the participating students' beliefs about attribution of their successes or failures to ability.

The effect of the program on decision making skills:

To answer the second research question of the first stage of the study about the effect of the program on the decision making skills of the participating students, paired- sample *t*-test was conducted for the four-dimensions of decision making: avoidance, self- concept, panic and impulsivity.

Table 2: *t*-test results of differences between pretest and posttest on decision making

Application	Dimensions	Mean	SD	FD	<i>t</i>	Sig.
Pretest	Avoidance	15.39	3.54	62	6.75	0.001
Posttest		17.52	1.99			
Pretest	Self- concept	16.36	3.10	62	6.01	0.001
Posttest		18.50	2.47			
Pretest	Panic	15.71	3.25	62	5.34	0.001
Posttest		16.29	2.76			
Pretest	Impulsivity	13.11	2.18	62	1.42	0.161
Posttest		13.31	2.27			

Table 2 shows that there were statistical significant differences at the significance level of (0.001) between students' mean scores of pretest and posttest applications with respect to their decision making skills of avoidance, self- concept, and panic. Such statistical differences were in favor of the posttest applications. However, there was no statistical difference between students' mean scores of pretest and posttest applications with respect to their decision making skill of impulsivity.

To verify the effectiveness of the enrichment program in modifying gifted students' attribution styles and decision making skills, (η^2) effect size was calculated. Results showed that the effect sizes were: (0.62) for the effort attribution style, (0.423) for decision making skill of avoidance, (0.368) for self- concept, (0.315) for panic. These values asserted that the program had positive effects on students' attribution style, and their decision making skills.

Study 2:

This second study was conducted during the summer of 2009. It aimed at deciding on the effects of summer enrichment program on the actively open minded thinking, autonomy and future time prospective of gifted students participating in a summer enrichment gifted program. The questions of the study were:

1. What was the effect of a summer enrichment gifted program on the actively open minded thinking of the participating gifted students?

2. What was the effect of a summer enrichment gifted program on the autonomy of participating gifted students?
3. What was the effect of a summer enrichment gifted program on the future time prospective of the participating gifted students?

9. Method

9.1 Participants

In this second study, only 18 gifted students of those participated in the study 1 talked part in study 2. This group of students were among the (63) students who participated in the first study.

9.2 Instruments

Actively Open-minded Thinking Scale (AOTS). The actively open minded thinking scale (Stanovich & West, 2007) is a self-report questionnaire consisting of 41 items. The scale was translated into Arabic using the prescribed procedure for this purpose, with native speakers and both forward and backward translations. A factor analysis was conducted on scores of 127 secondary school students to figure out the best factorial construction of the scale through exploratory factorial analysis. Then, a confirmatory factor analysis using LISREL (8.5) program of responses of 250 secondary students using the maximum likelihood procedure. Results revealed three factors including: flexible thinking, dogmatic thinking, and belief identification. Chi-square value was (9.57), and was statistically insignificant. Values of goodness of fit index were: (0.10) for root mean square error of approximation (RMSEA), (0.96) for goodness of fit index, (0.88) for adjusted goodness of fit index, and (0.85) for normed fit index. Cronbach's alpha reliability for these factors were: 0.66 for flexible thinking, 0.62 for dogmatic thinking, 0.65 for belief identification, and 0.69 for the overall scale.

Autonomy Scale. The autonomy scale (Noom, 1999) is a self-report questionnaire consisting of 15 statements about the ability to exercise control over one's life. It comprises three dimensions: Attitudinal autonomy (the perception of independence through self-confidence and individuality), Emotional autonomy (the perception of independence through self-confidence and individuality), and Functional autonomy (the perception of strategies by means of self-regulation and self control). participants were asked to indicate their degree of agreement with each statement on a five-point scale, ranging from "a very bad description of me" to "a very good description of me". After translation procedures, a confirmatory factor analysis was conducted on scores of 250 secondary school students. The maximum likelihood procedure, using LISREL (Version 8.5) was conducted to check students' responses on all three dimensions of the scale. Such procedure ascertained the factorial constructive validity of the scale. Moreover, analysis results showed insignificant Chi- square value of 9.84. Values of goodness of fit index were: 0.014 for root mean square error of approximation, 0.98 for goodness of fit index, 0.94 for adjusted goodness of fit index, 0.94 for normed fit index. Cronbach's alpha reliability for the three dimensions of the scale were: 0.63 for attitudinal autonomy, 0.67 for emotional autonomy, 0.70 for functional autonomy, and 0.75 for the overall scale.

Future Time Prospective Scale (FTPS). The future time prospective scale (Husman & Shell, 2008). is a self- report 27-item questionnaire about four dimensions: Connectedness, Value,

Extension, and Speed. Each item contained a stem statement that the participants were asked to rate using a five point Likert scale 1 (Strongly Disagree) to 5 (Strongly Agree). To examine the construct validity of FTPS, it was administered on a sample of 250 secondary students. A four-component solution was estimated by using maximum likelihood procedure. The FTPS model was estimated by the LISREL 8.01 program. Results ascertained the factorial constructive validity of the four dimensions of the scale. A statistically insignificant Chi- square of 9.84. Values of goodness of fit index were: 0.0 for root mean

9.3 Procedures

The instruments pretests were administered to the participants in the first day of the program, while the post-tests were completed two weeks after the program ended. In the posttest, the questionnaire designed electronically and was placed on the website for the program and made available for the students. All participants completed the questionnaires in the pre-tests and posttests.

Wilcoxon signed- rank test was used to answer the three questions. The Wilcoxon is a nonparametric statistical test for ordinal-scaled variables and is used with matched or correlated samples. In this study, we had a matched sample. Each factor of the three single scales was treated separately. The total scores on each scale were accounted for in order to figure out the effects of the summer enrichment gifted program. To check the effect size of the results, the following equation was used:

$$\text{Effect Size} = \frac{z \times \sqrt{2(1-R)}}{N} \quad (\text{Aaron \& Aaron, 1995})$$

9.4 Results

The Effect of the Program on the Actively Open-minded Thinking (AOT):

To answer the first question of this study about the effect of the enrichment program on the actively open minded thinking of the participating students, Wilcoxon test was used. Data obtained about the three dimensions of AOTS (belief identification, dogmatic thinking and flexible thinking), as well as the total score of AOTS were analyzed. Table 3 presents Wilcoxon test results of data analyzed.

Table 3: Wilcoxon test results of pretest and posttest of the AOTS

		N	Mean Rank	Sum of Ranks	Z	Sig.
Belief	Negative Ranks	7	7.36	51.50	-1.487	0.137
	Positive Ranks	11	10.86	119.50		
Identification	Ties	Zero			-2.557	0.011
	Total	18				
	Negative Ranks	3	9	27		
	Positive Ranks	15	9.7	144		
Dogmatic Thinking	Ties	Zero			-1.265	0.172
	Total	18				
	Negative Ranks	5	7.20	36		
	Positive Ranks	10	8.40	84		
Flexible Thinking	Ties	3			-2.393	0.017
	Total	18				
	Negative Ranks	4	6.50	26		
	Positive Ranks	13				
Total Score	Ties	1				
	Total	18				

Table 3 shows that there were no significant differences with respect to belief identification and flexible thinking dimensions of the actively open-minded thinking scale. However, there were statistically significant differences with regard to dogmatic thinking dimension and the total score of the actively open minded thinking scale ($p < 0.01$). Such differences were in favor of the posttest application. These results provide evidence that the enrichment program had positive effects on students' dispositions and attitudes related to dogmatic thinking dimension.

The effect of the program on autonomy:

To answer the question about the effect of the enrichment program on autonomy of the participating students, Wilcoxon test was used. Data obtained about the autonomy scale's three dimensions (attitudinal autonomy, emotional autonomy, functional autonomy). The total score of the scale was also considered. Table 4 presents Wilcoxon test results of data analyzed.

Table 4: Wilcoxon test results of pretest and posttest of the autonomy scale

		N	Mean Rank	Sum of Ranks	Z	Sig.
Attitudinal Autonomy	Negative Ranks	6	8.33	50	-0.939	0.348
	Positive Ranks	10	8.60	86		
	Ties	2				
	Total	18				
Emotional Autonomy	Negative Ranks	3	5.67	17	-2.278	0.023
	Positive Ranks	11	8	88		
	Ties	4				
	Total	18				
Functional Autonomy	Negative Ranks	2	9.75	19.50	-2.093	0.036
	Positive Ranks	12	7.12	85.50		
	Ties	4				
	Total	18				
Total Score	Negative Ranks	3	6	18	-2.604	0.009
	Positive Ranks	13	9.08	118		
	Ties	2				
	Total	18				

Table 4 shows that there were no statistically significant differences with respect to the dimension of attitudinal autonomy. However, results of Wilcoxon test revealed that there were statistically significant with respect to the dimensions of emotional autonomy and functional autonomy ($p < 0.01$), as well as the total score of the scale ($p < 0.05$). These differences were in favor of the posttest application. These results provide evidence that the enrichment had positive impacts on participating students' emotional and functional autonomy.

The effect of the program on future time prospective (FTP):

To determine the possible effect of the enrichment program on the participating students' FTP, Wilcoxon test was used. The four dimensions of FTP scale (speed, extension, value, connectedness), and the total score of the scale were analyzed.

Table 5: Wilcoxon test results of pretest and posttest of the FTP

		N	Mean Rank	Sum of Ranks	Z	Sig.
Speed	Negative Ranks	4	8.88	35.50	-1.078	0.281
	Positive Ranks	10	6.95	69.50		
	Ties	4				
	Total	18				
Extension	Negative Ranks	3	5.50	16.50	-2.046	0.041
	Positive Ranks	10	7.45	74.50		
	Ties	5				
	Total	18				
Value	Negative Ranks	3	4.33	13	-1.792	0.073
	Positive Ranks	8	6.62	53		
	Ties	7				
	Total	18				
Connectedness	Negative Ranks	2	1.75	3.50	-2.361	0.009
	Positive Ranks	9	6.94	62.50		
	Ties	7				
	Total	18				
Total Score	Negative Ranks	4	3	12	-2.911	0.004
	Positive Ranks	12	10.33	124		
	Ties	2				
	Total	18				

Table 5 shows that there were no statistically significant differences with respect to the dimensions of speed and value. However, the test results were statistically significant with regard to the dimensions of extension ($p < 0.01$). Differences in students' scores in the pretest and posttest applications of the future time prospective revealed that the enrichment program was effective in enhancing the future time prospective of the participating students.

10. Effect Size

The effect size of each dimension statistically significant was examined. Table 6 shows results of effect size equation of all significant dimensions as well as the total scores of the scales.

Table 6: Values of Effect Size of the Program on Variables with Significance Levels

	R	$\frac{\sqrt{2(1-R)}}{N}$	Z	Value of effect size
<i>Actively Open-minded Thinking</i>				
Dogmatic Thinking	0.45	0.247	2.557	0.631
Total Score of AOTS	0.60	0.210	2.393	0.504
<i>Autonomy</i>				
Emotional Autonomy	0.68	0.188	2.278	0.429
Functional Autonomy	0.52	0.230	2.093	0.483
Total Score of Autonomy Score	0.50	0.235	2.604	0.613
<i>Future Time Prospective</i>				
Extension	0.44	0.249	2.046	0.510
Connectedness	0.70	0.182	2.361	0.431
Total Score of FTPS	0.610	0.208	2.911	0.605

Table 6 shows that the effect size value ranged between 0.431 and 0.631. Such values revealed that the enrichment program had highly affected the study variables. The highest effect of the program was on the dimension of dogmatic thinking. As to the total score of the three scales, the highest effect of the program was on autonomy 0.631, followed by future time prospective 0.605, and then actively opens minded thinking 0.504. Overall, such effect size values asserted that the enrichment program had strong positive effects on the three variables of the study during its second stage.

11. Discussion

The effect of the program on the attributional styles:

The results reveal that the enrichment summer program had statistically significant effect on the participating students' effort attribution styles where the calculated effect size using Eta Square was 0.62. Meanwhile; the program had no effect on the students' ability attribution style. Such results raise an important question about the attribution style that may enhance the individual's competency. However, there are three point off views in this regard: (1) some believes that the individual's ability is more important than effort as an interpretation of his/her successes (e.g., Heller & Lengfelder, 2000); (2) Proponent researchers of the second view believe that the individual's ability without exerting effort does not lead to any accomplishment (e.g., Campbell, 1996b; Feng, et al., 2001); and (3) Proponents of the third view assert that ability and effort without self-regulated strategies do not lead to any accomplishment (Ammar, 2007; Zimmerman, 2000). This means that any attempt to modify students' attribution styles, without providing them with alternative strategies, may prove to be fruitless or with temporary effect. As such, the large effect of the enrichment program on the students' effort attribution style might be due to the alternative strategies provided to them; i. e., when students were trained to observe their behaviors and take full responsibility of their actions, they tended to realize the importance of exerting effort to succeed in the enrichment program. This, in turn, might be the interpretation for the large effect of the enrichment program on the participating students' effort attribution style.

The study findings showed that the enrichment program had no statistically significant effect on participating students' ability attribution style. Such result might be explained in terms of the nature of ability attribution style itself which is stable and uncontrollable; ability attribution style might be related to the individual's epistemological beliefs about the nature of ability as uncontrollable in born capability that cannot be modified due to learning (Dweck & Leggett, 1988). Moreover, the absence of the program' effect on the students' ability attribution style might be explained in terms of the socialization process that is prevalent in the Saudi society; where individuals do not tend to speak about their personal capabilities, as talking about oneself represents undesirable social behavior. Anyhow, findings of relevant research studies in the field of attribution styles of gifted students are conflicting. Such conflicting results might be due to two reasons: (1) The first reason has something to do with the level of giftedness among sample members represented in those research studies; i. e., as students are aware of their high ability levels, attribution of successes to those high abilities increases, (2) The second reason has something to do with the cultural differences among societies where those studies with conflicting results were conducted (Campbell, Tirri,, Ruohotie, & Walberg., 2004; Nokelainen et al., 2007).

The effect of the program on decision making:

Results reveal that the program had statistically significant effect on three dimensions of the decision making scale that were: Self-confidence, avoidance, and panic. However, the program had no statistically significant effect on the dimension of impulsivity. Values of Eta Square for calculating effect size ranged between 0.31 and 0.42. Such result proved that the enrichment program had positive impact on the participating students' psychological aspects related to decision making process; i.e., students' confidence in their abilities to make the right decisions was enhanced, levels of tension and anxiety associated with the decision making process declined, and avoidance of making decisions and complacency behaviors in such highly competitive program environment decreased. Such positive impact might be interpreted in the light of the good learning environment of the enrichment program; where students were provided with diverse opportunities to make decisions and take full responsibility of their actions. Moreover, such positive impact of the enrichment program might be perceived in the light of similar studies' findings (Eberle, 1974; Fiedler, 1988; Isen, 1993; Mellers, Schwartz, & Cooke, 1998) where students' affective aspects were proven to have strong impact on their decision making process. As such, it could be stated that findings of the present study were supportive of the summer enrichment program's effectiveness in the enhancement of decision making skills and modification of attribution styles of participating gifted students. In general, such findings could be viewed as an evidence of the enrichment program's success in the enhancement of critically important affective aspects to the development of giftedness.

The effect of the program on the actively open-minded thinking:

Results revealed that the program had statistically significant effect on the actively open minded thinking. Such effect was noted in the dimension of dogmatic thinking ($p < 0.01$), and the total score of the scale ($p < 0.01$). The effect size was 0.631 with respect to dogmatic thinking, and was 0.605 with respect to the total score of the scale. Such values proved that the program was very effective on the participating students' actively open minded thinking. And this result might be understood in the light of Perry's hypothesized stages of epistemological development in young childhood which asserts that epistemological beliefs related to absolute issues are superficial beliefs that do not enhance logical thinking. In other words, one's belief that complicated problems can be solved with one right answer, and that the right and wrong choices do not change at all, will not promote advanced system of critical thinking or open minded rational thinking (King & Kitchener, 1994; Kramer et al., 1992; Schommer, 1990, 1993, 1994).

Reviewing the items of the dogmatic thinking dimension, it is noted that they reflect the extent to which the individual accepts or rejects other people's opinions, as well as his/ her tolerance in cases of disagreement in opinions. Undoubtedly, closed minded dogmatic beliefs have negative impact on students' thinking styles and behaviors during their adolescence stage in particular. Therefore, change of participating students' closed minded dogmatic beliefs is considered a successful outcome of the enrichment program.

Contrarily, results of the study revealed that the program had no effect on the dimensions of belief identification and flexible

thinking of the actively open minded scale. This finding proved that students view with respect to their beliefs as related to self-concept did not change. Two interpretations of this finding might be: (1) Prevailing culture in the kingdom of Saudi Arabia strongly supports the transfer of cultural heritage from parents to their children. Therefore, students' responses to items such as "it's remarkable that children and their parents adopt same beliefs" in pre and post applications did not change, (2) Researchers believe that usage of the term "belief" in some of the scale's items had negative impact on students' responses. Most often, the term "belief" has religious connotation that generates some form of sensitivity when using it. Therefore, students' responses on items such as "the impact of whatever beliefs one has, is more important than experiences he/she goes through", the taken to be true beliefs are important to the individual to the extent that such beliefs cannot be forsaken," in pre and post applications did not change. As the program had no effect on the dimension of flexible thinking may indicate that the participating students' thinking structure did not change dramatically. It seems that long time and extensive effort are needed in order that students' beliefs and thinking structures be modified. Moreover, schools in general do not foster flexible thinking modes among students.

The effect of the program on autonomy:

Results revealed that the program had statistically significant effect on the dimensions of emotional autonomy ($p < 0.05$), and functional autonomy ($p < 0.05$), and the total score of the scale ($p < 0.01$). The effect size was (0.429) for the emotional autonomy and 0.483 for the functional autonomy, and (0.613) for the total score of the scale. Such values proved that the program had a high degree of positive influence on the participating students' autonomy. The program was successful in helping students develop a number of positive concepts such as: students were aware of their personal and behavioral autonomy, students' self confidence and personal abilities were enhanced, students were aware of their self-regulated strategies and locus of control, and students' abilities and self-dependence to take full charge of their personal activities were promoted. Such positive impact of the program could be interpreted in the light of opportunities made available to participating students where they acted as responsible independent individual learners with crystallized abilities, social skills and knowledge in various academic fields.

The effect of the program on future time prospective:

Results revealed that the program had statistically significant effect on the dimensions of extension ($p < 0.05$) and connectedness ($p < 0.05$), and the total score of the future time prospective scale ($p < 0.01$). The effect size was 0.510 for the dimension of extension, 0.431 for the dimension of connectedness, and 0.605 for the total score of the scale. Such values showed that the program had helped the participating gifted students develop a crystal clear and definite future time prospective. This result might be interpreted in the light of the experimental evidence assertion that the future time prospective of individuals is perceived as beliefs that are highly related to the prevailing socio-cultural milieu, and are changeable (Bond & Smith, 1996).

The statically significant difference in the dimension of extension refers to widening future time prospective of participating students, and making far reaching goals seem to be within reach. Most of the items of this dimension describe the students' future

time prospective and the extent to which students perceive a certain period of time as coming closer or still far. Moreover, the statistically significant difference that existed with regard to the dimension of connectedness demonstrated students' advanced abilities to make connections between current activities and future goals, and direct current actions to achieve such future goals. And such results might be interpreted within the existing relationship between future time prospective and self-regulation (Bembenutty & Karabenick, 2004), as well as gifted students' high ability of self-regulation or self-control that requires personal view of the future time prospective of participating students, and recognition of its impact on their current behaviors.

Future goals and actions needed to fulfill such goals might be better perceived within a wider framework of self-regulation.

12. Recommendations

Based on results of this longitudinal study, the following recommendations were offered to the decision makers and people concerned with nurturing gifted students and implementing particular education programs to develop their gifted capabilities:

- Conducting continuous assessment of contents, services and outcomes of summer enrichment gifted programs that take place in the kingdom of Saudi Arabia. Such continuous assessment is very much needed in order that relevant decisions are made based on findings of authentic investigation of learning outcomes that are actually accomplished by participating students in such enrichment programs.

- As "giftedness" is viewed as a complex composite made of cognitive and affective factors, it is imperative that curricular design and development of gifted education programs consider such factors. The learning experiences that students go through should seek to satisfy the cognitive and affective needs of the students. Therefore curricular materials, services and activities of summer enrichment gifted programs carried out in Saudi Arabia should take into account both cognitive as well as affective outcomes on equal basis.

13. Limitations of the Study

This longitudinal study attempted to investigate the cognitive and affective outcomes of a summer enrichment gifted program in the kingdom of Saudi Arabia. This program has gained its popularity as a result of its continuous application over ten consecutive years. As summer enrichment programs have not the same level of experiences, results of this longitudinal study must not be generalized to all local summer enrichment programs.

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