The Efficacy of the Total Giftedness Development Model

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Abstract

The study objective was to apply the Total Giftedness Development Model (TGDM) among a Saudi Arabian sample and study its effectiveness. The descriptive and case study research methods were applied on a sample of 807 male students, age 5 to 18 to test the efficacy of the model. Several instruments, including The Saudi Mental Abilities Test, Torrance Test for Creative Thinking, academic achievement scores, and Renzulli' s Scales for Rating Behavioral Characteristics of Superior Students (SRBCSS) were used in the study. The most significant results of the study are: (a) The TGDM effectively influences the increase of mental abilities of participating students. (b) The model significantly affects the creative abilities of participating students. (c) The model significantly affects the academic capabilities of participating students.

Keywords: Giftedness; total giftedness development model; intelligence; creativity; multiple identification method; Saudi Arabia.

Introduction

Experts in the field of developing curriculum for the gifted such as Clark (1986, 1992); Feldhusen et al (2002); Kaplan (1979, 1980); and Roberts and Inman (2007) agree that such curriculum should be differentiated from that offered to other students, according to the characteristics and needs of the individual. Over the years, researchers in the West developed models to address such a need (Colangelo & Davis, 2003; Laurence et al, 2005; Renzulli, 1986; Roberts & Inman, 2007; Sternberg & Davidson, 2005). On the other hand, development of gifted education in the Arab world in general and in Saudi Arabia in particular was dragging behind. As academicians from Arab countries recently interacted with their peers from the West in international conferences, the need for models that identify and nurture giftedness became more apparent. Review of research in gifted education in the Arab world shows, to the researcher's knowledge the rare existence of such models (Jarwan, 2004; Shakroun, 2008), and demonstrate the need to develop a model that can be used as the basis for program organization and development in a local setting (Batterjee, 2008; Khaleefa, 2008). The Total Giftedness Development Model (TGDM) (Batterjee, 2008) is one such model.

The TGDM (Batterjee, 2008) aims at nurturing giftedness in the school by providing the programs and activities that will satisfy differentiation and acceleration in a positive educational environment. More specifically the TGDM aims at promoting high level learning that is challenging and enjoyable, in public and private schools, regardless of differences in academic or demographic status, develop youths' plausible, inherent, or neglected giftedness through periodical evaluation of their capabilities, and provide opportunities for its enrichment. Furthermore, the model provides the services that promote students capabilities and employs flexible means to attain differentiation and acceleration of the curriculum.

The TGDM (Batterjee, 2008) consists of nine components that provide for diversification and differentiation to satisfy the different cognitive capabilities of students participating in its activities. The nine components are:

Giftedness Development Portfolio. The giftedness development portfolio is a systematic procedure for the collection, recording, and activation of data pertaining to giftedness, and for further follow up of students' development. The content of the portfolio

facilitates the collection, recording, and periodical updating of data pertaining to areas of strengths, interests, and talents for all students. Collected data are categorized in groups that represent areas of strengths, traits, areas of interest, and instructional learning, thinking, and expression style preferences. The portfolio consists of three main sections the first of which is status information, which documents known information about the student, and includes his academic record, abilities, interests, and styles preferences along with intelligence, aptitude, and creativity test results. The second section is talent development planning record, which includes student's goals and extracurricular activities that would lead to meaningful and appropriate high-level learning experiences to develop student's talents. The third section captures progress data on talent development (Khaleefa, 2004; Purcell & Renzulli, 1998).

General Enrichment Program. The general enrichment program consists of learning units developed to serve the program's general and specific goals, and targets all students. The program aims at exposing students to broad and diversified branches of knowledge, and different enrichment experiences in professions, hobbies, personalities, historic events, etc., that are not included in the regular curriculum. The program uses diversified presentation styles that would suit the different ways students acquire knowledge such as lectures, slide presentations, video presentations, pamphlets, books, etc.

Skills Development Program. The skills development program consists of training units, both theoretical and practical that cover a broad range of skills needed for developing the diversified abilities of students. The program provides the instructional methods and materials aimed at promoting the development of procedural and skillful abilities of targeted students. Areas of such development include high-level thinking abilities, creative problem solving, decision-making processes; affective skills such as sensing, appreciating, and valuing; developing and practicing a variety of how-to-learn skills; and multiple communication skills directed at maximizing the impact of students' products.

The Directed Activities Program. This program consists of groups of extracurricular activities that, in all, cover most activities preferred by targeted students, teachers, and administrators. The activities revolve around major disciplines, interdisciplinary themes, and cross-disciplinary topics. The program activity clusters, though different in content and purpose, deal with how-to-knowledge, thinking skills, and interpersonal relations that apply in meaningful real world situations. The main objective of the directed activities program is to provide opportunities for all students to work with adults to pursue areas of interest, and to develop areas of strength and creativeness. The program targets students, teachers, administrators, and parents.

The Specialty Enrichment Program. The specialty enrichment program aims at providing differentiated material in Quran, mathematics, science, Arabic and English languages to talent pool students. These units cover a spectrum of knowledge that supersedes in its content and depth what is taught to students in regular classes. Furthermore, teaching methods used in this program stimulate high level thinking (Bloom, 1985), cross discipline exchange of knowledge, and uses real life examples to demonstrate how acquired knowledge can be applied to resolve problems that affect the day-to-day life conditions that face modern societies.

The Directed Projects Program. This program activates acquired knowledge, skills, and experience to enable students to conduct investigative activities and artistic production to produce a meaningful product. This type of learning represents the practical application of students' acquired advanced level of understanding of knowledge and methodology that are used within particular disciplines, artistic areas of expression, and interdisciplinary studies. It also provides students with opportunities to apply their interests, knowledge, creative ideas, and task commitment to self-selected areas of study, and develop students' research methods abilities. This program targets talent pool students, either as individuals or as members of small groups.

Academic Acceleration Program. The academic acceleration program (Jarwan, 2004; Reis, Burns, & Renzulli, 1992; Van Tassel-Baska, 2005) consists of standards and procedures for the nomination of students to be accelerated. The standards include personality traits, scholastic, and cognitive abilities. Acceleration for one academic year or more is the type accredited by the Saudi educational system, and is the most popular form of acceleration.

Mentorship Program. This program consists of the strategic and operational plans that are implemented to satisfy participating

students' abilities and ambitions, and the procedures needed to achieve said plans. The aim of this program is to facilitate methodological differentiation for gifted students, each according to his individual abilities and needs, through strategic planning of his future. The program targets talent pool students, and is supervised by specialists in gifted education.

Support Program. The support program consists of four sub-programs, namely giftedness teacher training, psychological counseling, academic counseling, and parents' education. These sub-programs are designed to support the main programs of the TGDM, are all directly related to giftedness, and are considered necessary for the successful identification and development of the gifted.

It would seem that designing a model that satisfies pre-set gifted education criteria is not a very difficult task. Review of the literature about programs and models that serve gifted education reveals a number of such models and programs that could be used as templates, and then modified to accommodate Saudi cultural settings (Renzulli, 1986; Sternberg & Davidson, 2005; Van Tassel-Baska, 2005). The problem would be to implement the model in the school and test its efficacy.

The Saudi society's awareness of the needs of the gifted, how to nurture giftedness, and the negative implications; both economically and psychologically, of not catering for such needs is very minimal. Students in Saudi Arabia have only recently been introduced to high order thinking in the curriculum. They seem to do well in tasks requiring memorization and are used to being assessed in a manner that deploys recall of teachers' repeated instructions. Analytical, creative, and practical thinking are new concepts in the Saudi school environment, and have been recently introduced in private schools only. Institutions that prepare teachers for public and private schools also lack the curricula and the training that support modern teaching methodologies.

The little available literature on programs and models to identify and nurture giftedness in the Arab world necessitates the use of results obtained from models in non-Arabic speaking countries in this study. Shakroun (2008) stipulates that although since the turn of the century researches and conferences, in the Arab world, that advocate the importance of the identification of gifted children have increased in number, and improved in quality, its results did not translate into practical applications to improve the services provided to those children. Jarwan (2004) also noted that available studies indicate that in most Arab countries no special programs or national projects to nurture the gifted exist. In a meta-analysis study of Arabic literature in creativity and giftedness, Alburadi (2006) concluded that originality in Arabic research is poor; and theoretical research and concepts that could lead to the development of theories, models, and concepts that adapt to the Arab and Islamic culture framework is rare.

Contrary to the above background, students in the industrial world, to some extent are given the kind of education that supports individual abilities and style preference. Gifted education research has also produced programs and models that identify and nurture giftedness, and over the years, studies have accumulated support for its efficacy (Sternberg & Davidson, 2005; Van Tassel-Baska, 2005; Van Tassel-Baska & Brown, 2007). In one such study, Van Tassel-Baska and Brown (2007) reviewed 11 existing programs/curriculum to determine evidence of effectiveness for their use with gifted populations. The study revealed that six out of the models studied, namely Feldhusen, Renzulli, Schlichter, Stanley, Sternberg, and Van Tassel-Baska have some evidence of effectiveness with gifted populations in comparison to other treatments or no treatments. Result obtained also show that out of the models studied the two mega-models of Stanley (Stanley & Benbow, 1986) and Renzulli (Renzulli, 1988) compared favorably to the other models because both represent the methodology adopted in gifted education since the mid-seventies and in a good way insist on programmatic separation between enrichment and acceleration methods used in developing gifted children.

The Enrichment Triad/Revolving Door Model (Renzulli & Reis, 1986) is a comprehensive plan for school wide enrichment that is designed to overcome many of the problems that have hindered programs specially designed for students with exceptional abilities in the past. The model's aim is to provide various types and levels of enrichment to a broad spectrum of students instead of the limited number usually served in traditional programs for the gifted. It further aim to integrate the special program with regular classes, to develop a cooperative relationship between classroom teachers and administrators who are assigned to serve the gifted, to

minimize concern about elitism and negative attitudes that are often associated with students participating in such programs, and to improve the extent and quality of enrichment for all students.

Numerous researches support the validity and wide spread acceptability of the Triad Model (Burns, 1987; Delisle, 1981; Gubbins, 1982; Heal, 1989; Newman, 1991; Olenchak, 1991; Reis, 1981; Reis & Purcell, 1993; Renzulli & Reis, 1994; Skaught, 1987; Starko, 1986; Van Tassel-Baska & Brown, 2007). The results of these studies, in general, support using the model as an effective means to meet the educational, psychological, social, and emotional needs of a wide spectrum of high ability students.

Aims of the Study

The aim of this study is to validate the effectiveness of the TGDM as it has been applied at Dar al Thikr School. The study will therefore analyze the effect of the model on participating students in the areas of increasing intellectual ability as tested by The Saudi Mental Abilities Test (SMAT) (Alnafi et al, 1979, 2000), creative ability as tested by the Torrance Test for Creative Thinking (Alnafi et al, 1979, 2000; Torrance, 1966, 1988), and in improving academic performance as evidenced by students performance in periodical and final tests.

Method

Participants

The total sample of the study consists of student from Dar al Thikr elementary, intermediate, and high schools, which were established in 2001. The total sample consists of 830 male students, representing a mixed demography from middle and upper-middle classes, from different Arab and non-Arab nationalities, and from different parts of Saudi Arabia.

The total sample was divided into three groups, KG; grades 1, 2, 3, and 4; and grades 5 through 12 (see Table 1). The KG group was excluded from the study because of their age. The second group of grades 1 through 4 consisted of 442 male students, and the third group of grades 5 through 12 consisted of 365 male students. The modified sample used in the study consisted of 365 students, grades 5 through 12, representing 43.98% of the total sample.

Table 1: Distribution of students by grade level.

Grade Level	Number of Students	Percentage
KG	23	02.77
1 – 4	442	53.25
5-12	365	43.98
Total	830	100.00

Instruments Used in the Study

The Saudi Mental Abilities Test (SMAT) (Alnafi et al, 1979, 2000), Torrance Test for Creative Thinking (TTCT) (Alnafi et al, 1979, 2000; Torrance, 1966, 1988), as well as students' scholastic and demographic data were used in this study. When using students' scholastic data, the first semester mid-term results were considered the pre-test, and the average of the first semester finals, second semester mid-term and final scores, were considered the post-test. As students' scholastic data were based on in class tests, no tests for validity were conducted.

Procedures

The instruments used in the study were administered by trained examiners to students in the regular classroom between September 2007 and December of the same year, before introducing students to the TGDM. The examiners administered the same instruments again in June 2008, after students' participated in the model's programs. Administration of the instruments was done collectively in single sessions where students were grouped according to academic classes.

To validate the effectiveness of the TGDM when applied at Dar al Thikr School the researcher used data collected from applying SMAT, TTCT adapted for the Saudi culture, students scholastic records, and the forms and procedures of the TGDM. To measure the competency of the TGDM in identifying the enrichment pool students the multiple cutoff points method (Jarwan, 2004; Khaleefa et al, 2007) was used with selection criteria specified by both the TGDM and Renzulli's Triad Model. The selection criteria for the TDGM consists of students' scores of more than 110 points in SMAT and TTCT, more than or equal to 90% in end of year results in all regular curriculum subjects, and a score of more than or equal to 80% in at least one of the multiple intelligences (Gardner, 1983, 1993, 1999). As for the personal traits, 5.3 points was set for motivation and 4.3 points for both creativity and leadership. A 3.34 points level was set for any of the preferred subjects. In the Triad model (Renzulli & Reis, 1997) Renzulli has adopted a phased selection of enrichment pool students where 50% of the pool's constituent are selected based on standardized tests results, and the other 50% are selected based on teachers' and parents' nomination along with case studies.

In both the TDGM and the Triad model, the researcher applied the criteria to 365 male students in grades 5 to 12 at Dar al Thikr School. Two students were removed from the sample because of transfer, and the total number of students thus became 363. In the case of the TGDM, results show that 83 students, representing 22.87% made the cutoff points. The researcher used the case study method (Tellis, 1997; Yin, 2003) to analyze data pertaining to the remainder of the sample. In this process, students with SMAT score equal to or greater than 130 points were selected regardless of other indicators. The researcher used this approach to enable students who are underachieving in their academic schoolwork, or do not have the specified personal traits levels, or the preferred subjects' cutoff score, but possess the mental ability as indicated by their score on the SMAT to be included in the enrichment pool (Renzulli & Reis, 1997). This resulted in the addition of 22 students, representing 6.06% to the enrichment pool. The total enrichment pool number thus became 105 students, making 28.93% of the modified sample. In the case of the Triad model, the enrichment pool contained 109 students, representing 30.33% of the sample.

To ascertain the validity of the data for Z-Test and to calculate the standard deviation, F-Tests were applied to data obtained from SMAT and TTCT, and personal traits, for both models enrichment pool students' results. Z-Tests were used to determine the statistical significance of the results for both models under investigation, at a significance level $\alpha = 0.05$ (see Table 2).

Table 2: Mean, standard deviation, and Z values for both TGDM and TRIAD models.

Field of Comparison	Modifier	n	*M*	*SD*	*Z*	Z Critical
SMAT	TGDM	105	128.21	11.99	1.29	0.20
	TRIAD	109	126.02	14.00		
Motivation	TGDM	105	4.53	0.46	2.07	0.04
	TRIAD	109	4.71	0.35		
Leadership	TGDM	105	4.50	0.50	2.22	0.03
	TRIAD	109	4.72	0.47		
Creativity	TGDM	105	4.75	0.59	0.91	0.04
	TRIAD	109	4.84	0.56		
TTCT	TGDM	105	150.07	31.48	1.27	0.21
	TRIAD	109	144.71	30.47		

Results

In trying to demonstrate the efficacy of the TGDM, a major aspect of this research concentrated on examining the cognitive, creative, and scholastic abilities of participating students before and after they were introduced to the programs of the model. Because of the lack of previous research on the subject in the Arab world, the researcher used literature on similar models developed and implemented in other countries, namely Renzulli's Enrichment Triad/Revolving Door Model (Renzulli & Reis, 1986).

The researcher compared means and standard deviations for the two enrichment pools arrived at by applying the criteria of the TGDM and the Triad model. Results for SMAT show that there are no significant differences between the two models. On the other hand, the means calculated for motivation, leadership, and creativity were found to be 4.53, 4.5, and 4.75 for students identified by TGDM; and 4.71, 4.72., and 4.84 for Renzulli's Triad Model. These results are significantly different at $\alpha = 0.05$. In the opinion of the researcher, the results obtained for personal traits are somewhat subjective as they are dependent on the personal evaluation of the teachers, while the other instruments used in the study are the product of long scientific research. This opinion is in agreement with results obtained by Walker (2002) where he stipulated that although teacher's recommendations are widely used in identifying gifted students, problems caused by teacher's preference to more polite, cooperative, and well presented students (e.g. students who do their homework on time and are less troublesome), are inherent in this method. On the other hand, research by Jacobs (1971) demonstrated that it is possible to overlook underachieving students in spite of them being intelligent, and that preschool teachers have evaluated students as being gifted with a low degree of accuracy that reached 4.3%.

Although the results of this research agree in general with previous studies, the obtained percentage for the number of students in the enrichment pool calculated to be 30.03% for Triad and 28.93% for TGDM is higher than the levels set by Renzulli as being the ideal criteria of 15-20% (Renzulli & Reis, 1997). In the opinion of the researcher, this is due to the cultural and educational superiority of the students used in the sample as they come from families with good education and strong cultural background, and therefore have above average mental abilities and personal traits. In addition, the school where the study was conducted applies strict acceptance criteria and only students with strong academic credentials are admitted. These conclusions are supported by the distribution of the scores obtained in SMAT for the modified sample of 363 students (see Table 3 and Chart 1).

Table 3: Distribution of scores obtained in SMAT for the modified sample.

IQ Range	No. of Students	Percentage
+130	45	12.40
129 – 125	40	11.01
124 – 120	54	14.88
119 – 115	61	16.80
114 – 110	53	14.60
109 – 105	31	8.54
104 – 100	29	7.99
99 – 95	17	4.68
94 – 90	5	1.38
89 – 85	2	0.55
84 – 80	1	0.28
79 – 75	1	0.28
74 – 70	2	0.55
69 & less	22	6.06
Totals	363	100.00

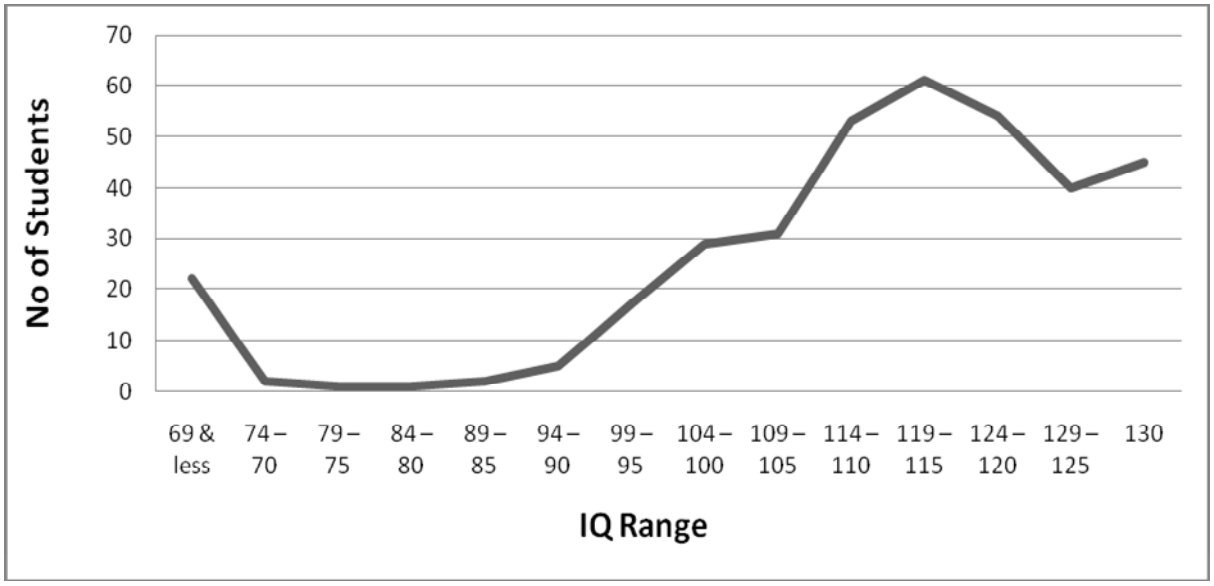

Chart 1: Distribution of enrichment pool students for TGDM by IQ.

The data of the above table and chart show that 12.33% of the sample scored 130 points or more and 38.08% scored above 120 points. Both figures are high when compared to results obtained by Alnafi (Alnafi et al, 1979, 2000), and indicate the superiority of the students in the sample. In addition, the average intelligence score for the sample is calculated to be 117.02 points, a number close to the cutoff score set for the gifted among students in general education in Saudi Arabia by Alnafi and others (Alnafi et al, 1979, 2000), and is still the cutoff score used to date. To test the statistical significance of the results, the researcher applied the Z-Test to the scores of the 363 students, and the mean and standard deviation that was arrived at from Alnafi's study (1979); namely, 100 for the mean and 15 for the standard deviation, and the sample average of 117.02 was also used (see Table 4).

Table 4: Results of Z-Test for the study sample in the SMAT.

Modifier	n	*M*	*SD*	Z value	*p*
SMAT Results Alnafi's Sample	1227	100	15	21.52	< 0.001
SMAT Results Study Sample	363	117.02	12.98		

Results show that the Z value is 21.52 at a significance level of 0.001, and that the *p* value is less than 0.001, which indicates that the results are statistically significant. These results agree with the conclusions of Davis and Rimm (2004) that the many differences in methods and means used in multiple identification methods will lead to differences in determining the percentage of gifted students worldwide. This percentage varies between states in the United States of America between 3-5%, while other nations use a cutoff level of 2 standard deviation points above the mean. Results obtained also agree with Renzulli's conception (1978) that the talent pool percentage could reach 25% of the school population.

Programs, and activities included in the TGDM focus on developing the cognitive, creative, and scholastic abilities of participating students. Enrolling in the training units of the Skills Development Program, participating in the Directed Activities Program, taking any of the enrichment classes, and conducting research as part of the Directed Projects Program encourage students to use high order thinking and expose them to challenges beyond the regular curriculum. Hence, another indication of the validity of the TGDM is its effectiveness in increasing the mental abilities of participating students. The researcher applied the SMAT (Alnafi et al, 1979, 2000) on a control sample of 363 students in grades 5 through 12, and on the enrichment pool students, between September and December 2007. The enrichment pool students were enrolled in the programs

comprising the TGDM for a period of nine months, after which the same tool was reapplied in June 2008. Twenty students, making 19.05% of the sample did not attend the second application of the tool. T-Test was applied on data from the 85 students making up the modified sample, and results for validity were compared at level $\alpha = 0.05$ (see Table 5). Furthermore, a comparison between SMAT data for the control group and post-test for the enrichment pool students, and the T-Test for independent groups results, show that statistically significant differences exist between the two groups at a level of $\alpha = 0.05$ (see Table 6).

Table 5: Means, standard deviation, and T value for pre and post results for enrichment pool students of SMAT.

Modifier	n	*M*	*SD*	T Value	*df*	T Critical
Pre Test	85	126.22	11.27	10.95	84	0
Post Test	85	131.11	10.94			

Table 6: Means, standard deviation, and T value for control group and enrichment pool students post results of SMAT.

Modifier	n	*M*	*SD*	T Value	*df*	*p*
Control Group	363	117.02	12.98	9.26	446	< 0.001
Post Test	85	131.11	10.94			

Results show statistically significant differences in mental abilities of the enrichment pool students when compared to their abilities prior to enrolling in the TGDM, and to the control group, at a level $\alpha = 0.05$, which validates the effectiveness of the TGDM in increasing the mental abilities of participating students. The results of the comparison between post test results of the enrichment pool students and the control group rules out the possibility of the effect of other factors in the school that could influence the mental abilities of the enrichment pool students.

The TGDM effectiveness on the creative thinking abilities of participating students was also tested with data collected from applying the TTCT modified for the Saudi culture (Alnafi et al, 1979, 2000; Torrance, 1966, 1988). Three sets of data were used, the first from a control sample of 313 students from grades 5 through 12, the second and third from pre-test and post-test of students of the enrichment pool respectively. The control group and pretest measurements were conducted between September and December 2007 in accordance with the model procedures. The same tool was reapplied in June 2008 after students participated in the model activities for a period of nine months. Eighty-four students, making up 80.00% of the enrichment pool took the second test. The T-Test was used to compare the results of the before and after tests for the participating students, and to assess the differences at the significance level, $\alpha = 0.05$ (see Table 7). Furthermore, a comparison between TTCT data for the control group and post-test for the enrichment pool students shows a difference in favor of the enrichment pool students. The T-Test for independent groups shows that the difference is statistically significant at a level of $\alpha = 0.05$ (see Table 8).

Table 7: Means, standard deviation, and T value for pre and post results of TTCT.

Modifier	n	*M*	*SD*	T Value	*df*	T Critical
Pre Test	84	150.86	33.18	2.37	83	0.02
Post Test	84	160.48	39.66			

Table 8: Means, standard deviation, and T value for control group and post results of TTCT.

Modifier	n	*M*	*SD*	T Value	*df*	*p*
Control Group	313	135	32.12	6.13	395	< 0.001
Post Test	84	160.48	39.66			

The above analysis verifies the validity of the model in affecting the creative abilities of participating students.

To test the validity of the effect of the model on the academic achievement of the enrichment pool students at Dar al Thikr School for Boys, a modified sample of 363 male students was used as a control group. Four weeks after school commencement, i.e. in the second half of September 2007, all students in the sample were tested in all academic subjects and the results were considered the pretest. Using the procedure in the TGDM, subsequent periodical test results, including final tests given at the end of June of the following year were tabulated, and the average of all seven tests was calculated and considered the posttest. Means, standard deviations, and differences were calculated for both the pre and posttests, and T-test was applied to verify the statistical significance of the results (see Table 9).

Table 9: T-test results in academic subjects for the control group.

Modifier	n	*M*	*S D*	T Value	*df*	T Critical
Pre Test	363	92.71	8.92	2.66	362	0
Post Test	363	93.40	6.42			

Results show that the difference between the means of the control group pretest and posttest are statistically significant at $\alpha = 0.05$, which indicate a slight improvement in the academic achievement of the average student in the school. More importantly, this indicates the positive effect of the TGDM on the school as a whole.

The same statistical analysis was repeated for a sample of the enrichment pool students that participated in the programs of the TGDM. The sample was made of 80 students making 76.19% of the total enrichment pool of 105 students. Results are tabulated in Table (10).

Table 10: T-test results in academic subjects for enrichment pool sample.

Modifier	n	*M*	*S D*	T Value	*df*	T Critical
Pre Test	80	95.96	4.81	4.32	79	0
Post Test	80	97.51	2.52			

Results obtained show that the TGDM has a statistically significant effect on the scholastic achievement of the enrichment pool students as well. To ascertain that the improved academic abilities of the enrichment pool students is attributed to the TGDM, test scores in academic subjects of students from the control group and the enrichment pool samples were also compared. T-test for independent samples analysis was applied to test the significance of the difference between the two groups at a significance level of 0.05 (see Table 11). Effect size computation to measure the magnitude of the TGDM on the enrichment pool students, was also performed (see Table 12).

Table 11: T-test results in academic subjects for the control and enrichment pool students.

Modifier	n	*M*	*S D*	T Value	*df*	T Critical
Control Group	363	93.40	6.42	5.68	441	0
Enrichment Pool	80	97.55	2.52			

Table 12: Effect size results for the control and enrichment pool students.

Modifier	n	*M*	*S D*	D	r
Control Group	363	93.40	6.42	0.85	0.39
Enrichment Pool	80	97.55	2.52		

Analysis of the results indicates that the overall cognitive abilities of the enrichment pool students supersedes that of the average student represented by the control group, which is a logical deduction supported by, and is in line with results obtained from the previous analysis. Cohen's d value (Cohen, 1988) of 0.85 indicates a large effect of the TGDM on the enrichment pool students when compared to the average student.

The obtained results also show that the standard deviation for the enrichment pool students' (2.52) is less than that for the control group (6.42), which indicates that the enrichment pool students are more homogeneous, and that the programs implemented in the TDGM have a more positive effect on the homogeneousity of such students than on the average student.

The obtained results agree with results obtained by Aldebaban and Alhazmy (Aldebaban, 1979; Alnafi et al, 1979, 2000) about the effect of enrichment programs on the academic achievement of students, in which they have documented such an effect and concluded that such programs constitute a successful way for nurturing them. The results also agree with Renzulli's vision in the Triad Model (Renzulli, 1994) in which he sees the school as a place for developing giftedness, where the primary goal is to encourage and develop high level learning in a challenging and enjoyable environment, regardless of demographic or academic differences. Literature review of the effectiveness of the SEM from several perspectives including personal and social development of students involved in its programs (Delisle, 1981; Heal, 1989; Olenchak, 1991; Skaught, 1987), in general support the use of the model as a plausible means for meeting the educational needs of a wide variety of high ability students.

Discussion

The results obtained from this research indicate that in general, the TGDM positively affects the performance of participating students. The validity of the TGDM is supported in a number of ways. First, Renzulli's Triad and the TGDM were both applied to the same sample of students, each model having its own criteria, and the resulting numbers of students in the enrichment pool were essentially the same. Secondly, an enrichment pool as defined by Renzulli constitutes 15-20% of the student population, and that it can be adjusted in accordance with the school's human and technical resources. Dar al Thikr's enrichment pool percentage of 28-30% can be attributed to the above average cultural and educational background of the students, and can be supported by the availability of advanced human and technical resources in the school. The descriptive data provided evidence that; in general, students' scholastic abilities have improved, and that the TGDM has a positive effect on the school as a whole. The results also indicate that, after participation in the TGDM programs, enrichment pool students' cognitive, creative, and scholastic abilities have improved beyond the rate attained by the average student.

Part of the TGDM effectiveness comes from the use of multiple identification method. Sternberg (1988, 2003); and Colangelo and Davis (2003) agree that giftedness cannot be discovered from a single test score; and that neglecting to examine other indicators of giftedness endangers the discovery of potentially gifted students. Khaleefa and his colleagues (Khaleefa, 2008; Khaleefa et al, 2007) utilized the multiple identification method in Sudan and concluded that the more the identification method is diversified the less the margin of error in the selection process if proper statistical methods are applied. The criteria used in the current research adhered to the criteria recommended by The Arab Organization for Culture and Art (Sadiq et al, 1996) in which general intelligence, creativity, teachers' recommendations, general scholastic scores, and scholastic scores in selected subjects, are used in identifying gifted students in elementary education. It can be argued that the results of this research are in line with the criteria used by similar researches available in the literature.

Batterjee (2008) has argued that one of the faults of the identification process in the Saudi education system is its dependence on single intelligence test scores. Review of the literature and theoretical concepts also supports the view not to exclusively depend on one test to identify gifted students. This review particularly advocates not to depend on general intelligence scores only, but to use multiple identification methods instead (Clark & Zimmerman, 1984a, b, 1987; Clasen & Clasen, 1987; Cox, 1987; Feldhusen & Hoover, 1986; Gallagher, 1985; Martinson, n. d.; Paris, Lawton, Turner, & Roth, 1991; Renzulli & Reis, 1985a, b; Renzulli, Reis, & Smith, 1981; Renzulli & Smith, 1977; Sternberg, 1986; Treffinger & Renzulli, 1986). In line with these views, the selection of students for the enrichment pool in the current study used multiple identification criteria that consisted of students' results in intelligence and

creativity tests; academic achievement; multiple intelligence; and personal traits. The results of the comparison between descriptive data for the TGDM and the Triad model enrichment pools validate the efficacy of the criteria used by the TGDM.

Models aimed at nurturing giftedness when applied to larger segments of the school population not only achieve their primary goal directed towards the gifted, but is also likely to enhance students' attitude towards learning (Olenchak & Renzulli, 1989). In a study aimed at analyzing the efficacy of curriculum models in gifted education, Van Tassel-Baska and Brown (2007) found that Renzulli's SEM had a positive effect on participating students. In the current study, analysis of pre and posttest results in academic subjects for the control group shows a slight improvement in the academic achievement of the average student, which is an indication of improved attitude towards learning.

Another element in determining the efficacy of the TGDM is its effect on the creative abilities of participating students. Renzulli and Reis (Renzulli, 1977; Renzulli & Reis, 1985a, b, 1997) showed that students' creative productivity is motivated by exposing them to diversified subjects of knowledge, multiple interests and learning styles, and training them on applying acquired advanced content, skills, and research methods to areas of their choice and interest. Students who enroll in the TGDM's programs, starting with General Enrichment and progressing towards Directed Projects' get exposed to such diversity of knowledge and learning styles; and get to apply what they have learned in projects that reflect real life situations. The data obtained from applying TTCT, on the control group and both the pre and posttest groups reveal the superior creative abilities of the enrichment pool students. The same logic is applicable for the results obtained from applying the SMAT and academic achievement, of participating students. In both cases, the enrichment pool students showed an improvement after being exposed the TGDM programs.

Such results are attributed to the integration between the programs included in the TGDM, and the mixture of personal traits, high cognitive and creative abilities, and above average scholastic performance as conceived and presented in this paper. Such a mixture of talent traits, when combined with integrated programs that complement each other in one model, that are logically related, and are subject inter related, will most likely lead to the identification, development, and nurturing of giftedness.

The outstanding performance of students that participated in this study is due, in the opinion of the researcher, to the expected benefits from implementing the TGDM. This is evidenced by two important elements that are strong indicators of the efficacy of the model. The first element is the presence of statistically significant differences in the effect of the model on the performance of the students from the study sample. The second element is the statistically significant differences between the performances of the enrichment pool students when compared to students of the study sample, in favor of enrichment pool students. The distinctive performance of the enrichment pool students is due, in the opinion of the researcher, to three factors. The first is the exposure of these students to advanced programs, in both depth and complexity; the second is their self-motivation and level of intelligence that exceeds that of other students; and the third is their level of challenge and enjoyment towards learning that is higher than the average student.

Implications for Future Research

The researcher recommends conducting an external audit of the TGDM every two years to ensure that the model is kept abreast of scientific development in the field of identifying and nurturing giftedness. Introducing the model in as many private and public schools as possible, regionally and internationally is expected to put the model to further testing and improvement.

The researcher recommends implementing the model in girls' schools, conducting a similar study to compare gender differences, a longitudinal study on the efficacy of the model, follow up research on the achievements of students of the Mentorship Program, and comparison research with other models to note the similarities and differences to the TGDM.

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