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Original Research Article

Effects of Enrichment Programs on the Academic Achievement of Gifted and Talented Students

ABSTRACT: The aim of the study was to explore the effect of enrichment programs on the academic achievement of gifted and talented students. The sample of the study consisted of (30) gifted and talented students studying at Al-Kourah Pioneer Center for gifted and talented students (APCGTS), Jordan. An achievement test was developed and applied on the sample of the study as a pretest and posttest. The results showed the effects of enrichment programs at APCGTS on improving the academic achievement of gifted and talented students.

Keywords: gifted & talented students; enrichment; academic achievement; Pioneer Centers

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INTRODUCTION

The gifted and talented students (GTS) receiving extra educational services, advanced curriculum, additional courses, better teachers, and more challenging learning environments than their non-gifted peers at the gifted and talented education programs (Dean, 2011). However, advocates of GTS programs stress that additional enrichment services are required for students with high mental abilities in order to reach their academic potential (Johnsen & VanTassel-Baska, 2006).

The GTS need educational programs different from the conventional programs that presented to them in the regular schools. Thus, they need educational services that satisfy their needs, since they possess abilities that make them different from their peers. Many GTS do not receive suitable services to meet their learning needs in the regular classroom (Reis, 2007). The objective of the educational programs is to enable them to become autonomous, creative, and productive learners in the society (Diezmann & Watters, 2000). The educational programs have to be characterized with several qualities for GTS, such as flexibility, so it can be altered every now and then to suit their needs, to develop their physical, mental, and affective aspects, to develop leadership skills, and to provide them with educational experiences (Hébert, 2010).

The educational programs of the GTS have to present educational subjects that suit their capabilities and interests; it should also broaden their horizon, provide opportunities for learning, and provide them with enough space to practice thinking about any project they may think about. Consequently, educational programs of the GTS must provide an educational environment rich with varied resources, the enrichment, and enough time to explore and train on the skills of the creativity and research (Phillipson, Phillipson, & Eyre, 2011; Kanevsky, 2011). The justification for the existences of the GTS educational programs is that the regular programs are incapable of satisfying their needs; therefore, they need special educational program. It is necessary to find a good quality of education by designing special enrichment programs in order to develop personal, cognitive, and social aspects (Hymer & Michel, 2002; O'Donovan, 2007). Most of the available educational institutions do not satisfy the needs of the GTS, and what the teachers do in the class, changing and adapting to satisfy their needs is not enough; consequently, the enrichment programs play a significant role in satisfying of GTS needs (Rotigel & Fello, 2004).

The Hashemite Kingdom of Jordan has done a great effort for the GTS by founding educational programs that take care of them; some of these programs are: Jubilee School, King Abdulla schools for Excellence, Giftedness Resource Room, academic acceleration, and Pioneer Centers for GTS (Jarwan, 2013). The Pioneer Centers are part of the educational institutions that take care of GTS aiming at broadening students' basic knowledge, developing their cognitive ability, helping them to understand themselves by giving them enrichment programs that provide them with new educational experiences. The enrichment programs in Pioneer Centers include research projects, scientific trips, contests, exhibitions and summer programs that include voluntary work, seminars, and camps (Ministry of Education, 2014). The idea of the Pioneer Center is based on the idea of not separating the GTS from their normal peers. The Pioneer Centers provide special education programs for the GTS after the end of the school day.

Enrichment programs are alteration and addition to the regular curricula of the regular students in order to meet the needs of the GTS in the cognitive, affective, creative, and psychomotor fields (Van Tassel-Baska & Brown, 2007). Enrichment programs could be activities, experiences, and subject matters that take the GTS beyond the regular curriculum, challenging their capabilities and fulfilling their curiosity, and occupying their time. They also help the learners achieve their creativity in the cognitive processes; therefore, the enrichment programs presented to the GTS should include suitable experiences and academic skills that ultimately lead to develop the students' skills (Sebring & Tussey, 1992).

The enrichment programs presented to the GTS in the Pioneer Centers are supplements to the general curriculum. In these supplements, the necessary skills and knowledge are defined, and they focus on higher thinking skills and include free study projects. The enrichment programs represent compatibility between the cognitive, affective, and emotional goals (Nogueira, 2006; Jarwan, 2013). Enrichment programs mean giving the GTS the opportunity to study the school subject matters in more deeply than what is done in the regular classes, and it also allows GTS to pursue their program side by side with their peers in the regular classes.

In order for the enrichment programs to achieve their effectiveness, they must take into consideration the needs of the talented and the students' interests regarding content. They must

also include techniques and strategies (Clarck & Zimmerman, 2002). The enrichment programs contribute to boost students' motivation, and polish their talent. In addition, enrichment programs have positive effects on developing self-efficacy and self-regulation (Heinz & Heller, 2002; Pereira, Peters & Gentry, 2010).

Renzulli suggested an enrichment program aiming at teaching the GTS creative and critical thinking processes. This enrichment program consisted of three levels: (i) exploring activities that include general exploring activities that aim at providing the appropriate environment for the talented students to deal with the school subjects that interest them; (ii) guided activities towards a certain skill, which include the techniques and the strategies that aim at developing thinking processes; (iii) and finally problem solving that include research activities and art and literary activities (Jean, 2010; Sally & Renzulli, 2010).

Moreover, Al-Shehri, Al-Zoubi, and Bani Abdel Rahman (2011) indicated the effectiveness of gifted centers in developing geometric thinking. Furthermore, Al-Zoubi, and Bani Abdel Rahman (2011) investigated the effectiveness of Gifted Center in Saudi Arabia in the areas of administration, teachers, and enrichment activities. Cho and Lee (2006) stressed that the presenting of enrichment to the talented students as early as the 4th grade is more beneficial than presentation them as late as the 7th grade. Bellamy and Sturgis (2005) revealed a significant correlation between emotional intelligence and self-efficacy among GTS participating in a two week long summer educational program. The summer programs promote to develop the emotional intelligence. However, Olszewski-Kubilius and Lee (2004) pointed out positive effects of the Saturday enrichment program on the academic talent development, including gaining of knowledge, motivation, and academic competence. On the other hand, Al-Khateeb (2003) showed the effects of enrichment activities at the Pioneer Centers on improving English language skills for GTS. Al-Bal'awi (2005) agrees with Al-Khateeb about the effects of the enrichment programs at the Pioneer Centers on improving academic achievement among GTS. Thus, Diezmann & Watters (2000) aimed at providing the talented students with a group of enrichment strategies. The approach is based on a pull-out enrichment program in science which included cognitive skills in the science syllabus in a social context. The results have significance of enrichment strategies for the gifted students and

teachers. In contrast, Mcallister and Plourde (2008) revealed that the pull-out enrichment program contains a positive implication for the GTS. This program meets their specific needs and learning styles, which includes inquiry based, discovery learning approaches emphasizing open-ended problem-solving with multiple solutions. Chávez, Zacatelco and Acle (2009) indicated the effectiveness of a creativity enrichment program; with educative play activities on encourage the gifted student abilities to promote an excellent educative, emotional and psychological development.

METHOD

Participants

The population of the study consisted of (120) male and female students from the seventh grade who were nominated for the admission in APCGTS, Jordan. The GTS distributed equally on four classrooms, two sections for females, and two sections for males. However, the sample included (30) students, (M= 15, F=15) chosen by simple random sampling through lottery method. The sample formed (40%) of the population of the study.

Instrument

In order to achieve the objectives of the study, an achievement test was developed and adopted by APCGTS. The test consisted of (50) multiple choice questions, divided evenly into the Arabic Language, English Language, Science, Mathematics, and thinking skills. A grade of (1) was given to the correct answer, and a grade of (0) to the wrong answer. To verify the reliability of the test, the Internal Consistency Coefficient was computed by using Kuder- Richardson Formula (KR-20); it was 0.81.

Research Procedures

- An Achievement Test was applied on the sample of the study at the beginning of the first semester 2013, as pretest.
- The sample of the study enrolled in enrichment programs at the APCGTS, which included enrichment activities in the Arabic language, English language, mathematics, science, and thinking skills during the first and the second semesters 2013/2014.
- An Achievement Test was applied on the sample of the study at the end of the second semester 2014, as posttest.

Research Design

This study used the one group Pretest-Posttest Design which is one of the pre-experimental designs. Pretest-posttest designs are widely used in behavioral research, primarily for

the purpose of comparing groups and/or measuring change resulting from experimental treatments (Dimitrov & Rumrill, 2003).

Table 1. Research design of study

Pre-test	Treatment	Post-test
O	X	O

RESULTS

The first question of the study was as follows: "Do enrichment programs have any effects on

academic achievement of GTS?". Means, standard deviations and T-test were conducted to compare the means of the pre-achievement and post-achievement test, as shown in table 2.

Table 2. T-test results of pretest and posttest

Test	N	M	XX	SS	T	P
Pretest	30	37.16	3.343	29	83.15	* 0.01
Posttest	30	41.83	2.755			

* $p \leq .05$

Table 2 shows that there are statistically significant differences between the means of the students' achievement on the post-achievement test, indicating that students' performance improved due to the enrichment activities at Al-Kourah Pioneer Center, where the means on the post-achievement test was ($\bar{X}=41.83$) and ($p=0.01$) with statistical significance.

The second question was as follows: " Do enrichment programs have any effects on academic achievement of GTS attributed to gender ? ". The means and standard deviations on the post-achievement test were computed, as shown in table 2.

Table 3. Means and standard deviations of post-achievement test

Gender	N	M	SD
Male	15	41.86	2.99
Female	15	41.80	2.59

As seen in Table 3, there are differences between the means of males and females students; the means of the males was ($\bar{X}=41.86$), and it is higher than that of the females, which was ($\bar{X}=41.80$). In order to investigate the effects

of enrichment activities on the academic achievement of GTS, One-Way Analysis of Variance (ANOVA) was used to determine the statistical significance attributed to gender, as shown in table 4.

Table 4. ANOVA results of post-achievement test according to gender

Source of variance	SS	df	MS	F	P
Between groups	0.033	1	0.033	0.004	0.949
Within groups	220.133	28	7.862		

ANOVA results in the table 4 show that there are no statistically significant differences attributed to gender, since there were no differences between the male and the female students on the post-achievement test due to gender.

DISCUSSION AND CONCLUSION

The study aimed at investigating the effect of the enrichment programs on academic achievement of GTS. The results showed that there is an obvious effect of the enrichment activities on the talented students' achievement,

since the differences were statistically significant between the performances of the talented students attending the Pioneer Center on the post-achievement test, attributed to the enrichment activities. The improvement in the talented students' achievement could be best explained by the fact that the enrichment activities at the Pioneer Centers included experiences and activities that helped to provide the talented students with knowledge and skills lead to their improvement. In addition, the enrichment activities were planned and prepared in a progressive way and according to certain criteria in both constructing their content and

choosing their educational and assessment activities. Besides, seminars and research sessions between the students themselves and between the teachers and the students helped to improve the students' achievement and develop several academic sides. Stake and Mars (2001) confirmed the effect of the enrichment activities and programs, especially with the availability of competent teachers supervising these programs.

Consequently, the Pioneer Center contributes to raising the talented students' awareness and knowledge of the basic skills by providing them with enrichment activities that provide ever renewable knowledge, and encourage them to think critically and creatively, and develop their personalities from various aspects; and this is what Al-Shurman (2003) confirmed in her study. Furthermore, Al-Shehri et al (2011) stated that talented students' thinking skills could be improved when the enrichment activities and programs are provided with the appropriate educational environment. The enrichment programs play a significant role developing the students' scientific and academic skills. Additionally, Fernandez, as cited in Al-Shurman (2003) indicated the effectiveness of the enrichment programs on developing the students' oral language skills and critical thinking skills. Kaminsky (2007) pointed out the effectiveness of the enrichment activities on the talented students' achievement. Thus, Olszewski-Kubilius (2003) stressed that the gifted programs outside of school can uniquely contribute to the process of talent development by confrontation gifted students to academically challenging coursework and construction social support from gifted peers. Furthermore, several studies have shown the effects of gifted and talented programs on academic achievement, critical thinking, creativity and self-esteem of GTS (Rogers & Span, 1993; Kulik, 1992; Hertzog, 2003).

The results of this study showed the effectiveness of enrichment programs at the Pioneer Center on improving academic skills of GTS. The study also showed the effectiveness of the Center as one of educational alternatives for GTS in Jordan. It can justify the effectiveness of enrichment programs on academic achievement to the philosophy of Pioneer Center which was based on the importance of selecting the administrative and educational staff and pre-planning of designing enrichment programs.

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