A study of the Application of High Achiever Programs for Gifted Students

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Abstract

Introduction. This research focus on to provide a project for gifted students with enrichment programs that can be performed at the school level.

Method. In order to accomplish this, the programs were designed, teachers were trained at six educational centers, 37 gifted students were selected and attention testing was applied (D2); Creating testing (PIC and CREA) and Cognitive Abilities for Solving Interpersonal Problems (Evhocospi) testing were applied before and after performing the Expanded Curriculum, Creative Literature, Scientific World, Creative Mathematics, Art and Culture and Cooperation programs.

Results. The results reflect significant improvements in attention, creativity and interpersonal problem resolution in gifted students that participated in the High Achiever Project programs they also reveal new procedures for applying programs for gifted students in the school context

Discussion and Conclusion. The intervention program at the *expanded curriculum* level can be implemented in order to exercise higher intellectual abilities

Keywords: Giftedness, enrichment programs, attention, creativity, interpersonal problems.

Resumen

Introducción. Esta investigación se enfoca en proporcionar un proyecto para estudiantes dotados con programas de enriquecimiento que se pueden realizar a nivel escolar.

Método. Para lograr esto, se diseñaron los programas, se capacitó a los maestros en seis centros educativos, se seleccionaron 37 estudiantes dotados y se aplicaron pruebas de atención (D2); Se aplicaron pruebas de creación (PIC y CREA) y Habilidades cognitivas para resolver problemas interpersonales (Evhocospi) antes y después de la ejecución de los programas Currículo Expandido, Literatura Creativa, Mundo Científico, Matemáticas Creativas, Arte y Cultura y Cooperación.

Resultados. Los resultados reflejan mejoras significativas en la atención, la creatividad y la resolución de problemas interpersonales en estudiantes dotados que participaron en los programas del Proyecto High Achiever. También revelan nuevos procedimientos para aplicar programas para estudiantes dotados en el contexto escolar.

Discusión y conclusión. El programa de intervención en el nivel de currículo expandido se puede implementar para ejercitar habilidades intelectuales superiors.

Palabras clave: Superdotación, programas de enriquecimiento, atención, creatividad, problemas interpersonales.Abstract

Introduction

Programs for Gifted Students

Giftedness is a field that requires studies and applications that are analyzed and assessed rigorously because this field lacks standardization (Sastre-Riba, 2014) and is handled with a misunderstanding of the nature and identification of gifted students, which generates inefficient Pyscho-educational practices (Dai, Chen, 2013). Moreover, the evaluation of the practical results is part of current research being conducted in order to rethink the diagnostic processes and educational interventions carried out in order to assess whether the programs develop the full potential and favor an adequate learning process (Ziegler, Stoeger, & Vialle, 2012). These problems lead to the need to see advances in multidimensional paradigms that develop talent beyond that measured by the IQ test (Renzulli, 2012) along with the study of cognitive variables such as intelligence and creativity and non-cognitive variables related to social adjustment and adaptation (Hernández & Gutiérrez, 2014).

Our research concentrates on measuring the results yielded in gifted students in the areas of attention, creativity, and interpersonal conflict resolution after applying the programs designed specifically for this purpose. These programs are all part of the High Achiever Project, which started in 2000 in order to address gifted students at the educational level. Our starting point was the study of the current models regarding high capacities that have identified high capacity students over the last few years. Also, we aimed to create some models based on those presented by Gagné (2004), that suggests that predictive elements such as general or specific intellectual potential, sensorimotor skills, creativity and management of resources and other psychosocial resources of motivation for the task, interests, effort, educational opportunities and luck. Renzulli (2012), highlight creativity and high intellectual capability and the importance of creative products and involvement in the task. Feldman (1982), affirmed that creativity is essential for crystallizing giftedness. Sternberg (2003), proposes a giftedness and creativity model in which intelligence supports analytical thinking and judges the quality of the ideas, while creativity allows for problem formulation and provides adequate solutions or depending on intellectual skillsets (abilities) and creativity projects depending on the talent and Multiple Intelligences they may have (Gardner, 1983, 1984). Lately, it has been highlighted the relevance of Intellectual modus operandi functions

convergently and divergently when resolving problems and consolidating creativity in the modern parameter for gifted learners (Sastre-Riba & Pascual-Sufrate, 2013).

The most characteristic models for high achievers have created the foundations for identifying these types of students, and provide the framework for designing intervention programs. All of these models share common elements, such as intellectual capacity and creativity even though they also point out other specific differences, such as implication in the task (Renzulli, 2012), multiple intelligences (Gardner, 1983), predicative elements such as general and specific intellectual potential, sensorimotor skills, management of resources and other psychosocial resources for motivation to the tasks, interests, effort, educational opportunities and luck (Gagné, 2004). Creativity particularly stands out and is considered essential for the development of high achievers (Feldman, 1982); furthermore, a gifted and talented model is proposed in which intelligence permits analytical thinking and judges the quality of ideas, while creativity permits the formulation of problems and provides adequate solutions (Sternberg, 2003) in order to consolidate creativity with the application of convergent and divergent thinking in problem solving, and this leads to the consolidation of creativity in the modern high achievement parameters (Sastre-Riba & Pascual-Sufrate, 2013).

To identify high achievement, researchers have for some time been considering it necessary to apply psychometric tests for intelligence with IQ results that are equal to or greater than 130 (Feldman, 1982; Lubart, 2006; Calero et al., 2007; Montero et al., 2005; Navarro et al. 2006; Peralta & Repáraz, 2002; Ramiro et al., 2010). In addition, holistic models are being incorporated which include cognitive, non-cognitive and contextual personal variables in both primary (Prieto et al., 2006; Ramírez, Álvarez, Jiménez & Artiles, 2004; Sánchez et al., 2007a; Sánchez et al., 2007b) and secondary school students (e.g., Ferrándiz et al., 2010) and Multiple Intelligences are assessed via dimensions assessed in school. These include academic components such as linguistic, mathematical logic, naturalist and visuospatial intelligences and a non-academic component that comprises corporal, musical and social intelligences (Hernández-Torrano, Ferrándiz, Ferrando, Prieto & Fernandez, 2014). Various facets of the cognitive and creativity functions (Gagné, 2004; Gardner, 1983; Sternberg, 1985; Lubart, 2006) or tests for identifying verbal and mathematical Talent are analyzed (Talent Search Model adapted to the Spanish educational context, Tourón, 2011). Nonetheless, these data seem insufficient and there are other aspects

such as attention, which could be the object of diagnosis, since one of the current controversies is that the behaviors of lack of self-control in gifted learners is often confused with attention deficit and hyperactivity issues, given that some of these behaviors are very similar (Harnett, Nelson & Rinn, 2004).

High Intellectual Capacities and Attention

There may be gifted children that are erroneously diagnosed as having attention deficit and hyperactivity (Lawler, 2000). Some may be gifted learners (Moon, Zentall, Grskovic, Hall & Starmont and Spurgin, 2001) whilst others may confuse gifted-learner characteristics with issues related to attention deficit and thus delay the same diagnosis (Moon, 2002). These situations, along with other causes, have increased the number of attention deficit and hyperactivity cases (Olfson, Marcus, Weissman & Jensen, 2002), influencing school dropout rates in gifted learners and therefore require the analysis, diagnosis, and the interventions required for resolving it. Neuroscience studies indicate that attention requires concentration and neuropsychological abilities that have an impact on behavior and learning (Martín-Lobo, 2003).

Creativity

Understanding creativity requires a multidimensional knowledge of the person, process, product and environmental pressure and and how to make it available in the classroom (Martín-Lobo, 2006; Kim, 2011). Creativity may be defined as the capacity to produce something new and there are various cognitive and environmental factors that influence creative potential (Lubart, Mouchiroud, Tordjman & Zenasni, 2003). The abilities of information processing and of higher-level thinking functions improve creative thinking and require the flexibility of thinking and of convergent and divergent thinking (Sternberg & Lubart, 1995). Flexibility is the ability to find different solutions to problems and discovering different angles for understanding. The ability to generate different ideas in the face of a stimulus corresponds to divergent thinking (Guildford, 1950; Lubart, el al, 2003) and is complemented by convergent thinking. Furthermore, the school setting is crucial in determining creative development. It can favor or jeopardize the development of creativity because the student needs to perform activities freely, make decisions and assume the corresponding risk this decision entails (Lubart et al., 2003). Modern neuroscience studies the neuropsychological basis of the creative process (Kaufman, Kornilov, Bristol, Tan, & Grigirenko, 2010) and the implication of the frontal lobe, the rear portions of the brain

(Heilman, Nadeau, & Beresdorf, 2003), the basal ganglia (Dietrich, 2004), and the activity of the parietotemporal area, highlighting the importance of the parietal area in the creative process. In addition, the cingulated cortex is implicated in the steps to be completed, and the frontal regions are involved in complex tasks, whilst the thinner cortical grey material in the right angular turn is related to creative performance (Jung, et al. 2010). Consequently, on the basis of what has been previously described, we can state the need to identify and develop creativity and its hierarchical implementation with high intellectual capacity (Cramond, 2011).

Social and Cooperation Abilities

Controversy exists with respect to the social issues that may be manifest in gifted children. Some authors state they may have academic and social difficulties, particularly if the academic environment does not address the stimuli they require. They have a higher intelligence level, high intellectual abilities, creativity and good use of oral and written language, but they also possess low self-esteem and it is difficult for them to overcome personal frustrations, resolve problems with their friends, and control their internal and external behavior (Jiménez, 2000). Bermejo, Fernández, Prieto, Soto and Sáinz (2013) compared the cognitive and creative profile of a group of students with high self-perceived emotional intelligence (called emotional talents in the study process) and a group of students with medium-low self-perceived emotional intelligence. The results indicated statistically significant differences in numeric reasoning, verbal reasoning and perception speed in favor of students with medium-low emotional intelligence. Other authors, in contrast, state that gifted learners do not have social problems and that this is a stereotype that has been created and that it does not reflect reality. Borges, Hernández-Jorge and Rodríguez-Naveiras (2011) demonstrated that personal, social and scholastic adaptation of gifted students does not differ significantly from that manifested by other non-gifted fellow colleagues, thus concluding that there is no reason to believe that maladjustment and high intellectual capacity (giftedness) are related variables. In any case, social relationships may constitute a challenge for these types of children and various studies concentrate on this concept, focusing on the theoretical basis and intervention programs required for improving interpersonal relationships (Monjas & González 2000; Gismero, 2000). When the school context provides help with social requirements, personal autonomy is developed and the social relationships of the child improve accordingly (Deci & Ryan, 2000; Eccles et al., 1993; Wigfield el al., 2006). As

such, the assertive abilities are also developed as and the communication level with others increases. Thus, social and cooperation abilities must be an integral part of the programs for gifted learners.

High Achiever Project

The objective of the High Achiever Project is to address the needs of gifted students at the educational level through intervention programs at the school. Such programs include *expanded curriculum programs* to exercise higher level intellectual abilities, *creativity programs* that include tasks related to the creative process phases of increased awareness, incubation, insight, verification. These are related to the school curriculum, taking into account the interests of the students, including those with Multiple Intelligences, the *social and cooperation ability programs* being designed to develop personal and interpersonal values. The High Achiever Project began in 2000 at educational centers in Spain, followed by Italy, Mexico, Peru and Chile. Previous studies showed the need to apply programs in schools to develop children's talent (Martin-Lobo, 2006) and several communications were presented in international conventions on the positive effects of the contents and methodology of the programs on Creative Literature and Art and Culture (INFAD Congress, 2003). Differences in neuropsychological abilities were obtained in favor of gifted students (10th Conference of the European Council for High Ability in Spain, 2004). These differences reflected improvements in both Intrapersonal and Interpersonal Intelligence after applying the program (11th Conference of the European Council for High Ability in Finland, 2006) and significant differences were obtained in creativity as a consequence of the application of a Technology program (12th Conference of the European Council for High Ability in Prague, 2008). The High Achievement Project was financed by the European Community in order to carry out a Comenius Project between educational centers in Germany, UK, Netherlands and Spain. This program is known as *Program for improving gifted learners via shared projects*.

Basis (Background)

Gifted children require an educational project that focuses their attention and addresses their particular needs. Whilst performing interesting activities is helpful, it is still insufficient. A project that integrates intellectual programs, creativity programs and cooperation programs is required. See Figure I in the Anex.

The High Achiever Program is an Enrichment project designed to provide talented and gifted students (4 to 18 year olds) with solutions at the educational level in educational centers. It is applied in three phases. In the first stage, executives, psychologists, psychopedagogists, and teaching staff at the educational center are trained, whilst counselors and school psychologists run tests for identifying giftedness in students including the IQ test, Multiple Intelligence questionnaire and creativity test (CREA or PIC, depending on the age of the students). In the second phase, the teaching staff at the educational center apply the cognitive ability and expanded curriculum, creativity and cooperation programs for two days a week using both extracurricular activities and the classroom.

Objectives

Expanded Curriculum and Cognitive Ability Programs: Relevant teaching provides opportunities to explore independently and in a meaningful manner through the use of cognitive strategies that improve the development of one´s individual potential and cognitive commitment (Helme & Clarck, 2001).

Creativity Programs: Increased awareness, incubation, insight, and verification are the creative process phases. Each of these phases are developed via strategies and activities to design the Intervention Programs, Creative Literature, Scientific World, Creative Mathematics, and Art and Culture. Upon carrying out the activities, an environment of stimulus and freedom are favored, which improves creativity (Lubart et al., 2003).

Cooperation Programs: The help received from professors in the field of emotion improves the implication of students in the programs and organized activities in the classroom and helps to generate behavior that is less disruptive (Patrick, Ryan & Kaplan, 2007; Ryan & Patrick, 2001; Wang, Brinkworth & Eccles, 2013). Furthermore, gifted students need to have a sense of the degree to which they differ from their peers in terms of possessing a higher level of intelligence and creativity, and cooperation with others provides them with the ideal procedure for developing their values, making them feel that they are growing as individuals (Martín-Lobo, 2004).

The programs offer an opportunity to enrich the curriculum, orientation, flexibility and adaptability to each of the students, participation in team work, project development,

cooperation with classmates and assessment of students in skills, creativity and cooperation with others. One day a week, he performs creative Lierature activities; for example, write a play based on a story, and perform a scientific experiment. The second day of the week they carry out activities of Art, for example, painting in the impressionist style, after observing a scene or a landscape. In addition, they collaborate in service learning activities in the classroom, in the school or in the community where they live. They also use technology programs to select information and expand knowledge to reflect on a project, to use visual language or to propose creative solutions to problems.

Each of the Expanded Curriculum programs and cognitive, creativity and cooperation abilities contain a *Teacher's Guide* with the Objectives, Foundation, Structure, Methodology, Planning and Assessment and *Activities for Students*, along with the guidelines for carrying them out, in the form of both material and technological support. Teachers receive specific training prior to applying the programs and they are selected on the basis of possessing university degrees in Educational Psychology, experience and, depending on the applicable programs, based on guidelines provided by the International Panel of Experts for Gifted Education (2009). The specific training received by the professors consists of courses on updating training in giftedness, including study of the contents and the Teacher Guides regarding activities for students for each of the High Achiever Project programs provided to them, in order to further enrich their contributions and the development of technology courses.

Students are organized into groups of 8 to 10 with common profiles at the intellectual level and in similar age intervals. They perform the programs with different teachers, in two 50-minute sessions per week, in an intellectual, creative, and relaxed atmosphere. An expert in giftedness periodically observes the activity of the application of the programs and assesses the executives and teaching staff via observation and working sessions with the teaching staff and psychopedagogical counselors. Students and programs are evaluated by professors at the end of each quarter and of each academic year. Parents receive information regarding the progress of their children in relation to the programs, their personal implication in the programs, and their cooperative and creative attitude. This study is relevant due to the absence of projects for gifted students, and this article aims to present a high achiever project implemented at educational centers and the corresponding results/outcome derived from it.

Objetives and hypothesis

The following hypotheses were addressed in this study: (1) There will be a significant difference in the form of an increase in attention after performing the High Achiever programs, since the intellectual, creativity and cooperation abilities may provide the appropriate setting for stimulating learning based on their particular needs (Jiménez, 2000). (2) In line with research conducted on creativity that indicates the need for a stimulating environment for developing the creative potential (Lubart, et al., 2003), creativity will significantly increase. (3) Cooperative learning improves participation among the students and improves interaction between groups in the class (Higgins el al., 2011), and consequently, interpersonal conflict resolution abilities will be developed after taking part in the cooperative activity programs of the Higher Achiever Project (Hypothesis 3).

Method

Participants

There was a total of 37 participants (16 boys and 21 girls), between the ages of 8 and 12 who attended six different schools in various regions of Spain. All of these children were selected and identified as gifted learners. The final sample for the analysis included 22 students with a IQ of 130 or above that took part in all the programs. The other participants took part in some of the programs, but were not included in the final sample given that they had a IQ below 130. The final sample for the analysis included 22 students with a IQ of 130 or above that took part in all the programs. The other participants took part in some of the programs, but were not included in the final sample given that they had a IQ below 130. In addition, creativity tests were applied, but they were not taken into account for the selection of the sample because the management guidelines considered that the IQ was the most important element for the selection of the sample for this study. In order to support the reliability of the results we conducted test to analyse statitistical power of the data. An Ethics Committee from the Psychology Department of the University Center at Villanueva of the Complutense University of Madrid previously approved the application of the tests and the parents of the participating students submitted their permission for their children to participate in the program. The selected students had an IQ equal to or greater than 130, according to the WISC´R Weschler scale for children (1974; TEA, 1993) applied individually in order to

conform with the international standards currently in place for identifying gifted students, which is the most used test despite its limitations (Navarro, Ramiro, López, Aguilar, Acosta & Montero 2006; Renzulli, 2012). The validity of the Weschler scale has an α of 0.89 and it is one of the most commonly used instruments to assess intelligence.

Measurement variables and instruments

The high achievement program used is an independent variable in the study and the changes before and after its application are analyzed. The dependent variables were the cognitive skills of attention, creativity and interpersonal problem solving. In order to measure these variables, we used the following instruments:

Attention Test – D2, R (Brickenkamp & Zillmer, 2000). Evaluation of selective attention and concentration, through the selective search for relevant stimuli. The variables obtained were TR (total number of elements processed, reliable measurement of a normal distribution of attention-selective and sustained-,processing speed, amount of work performed and motivation), E (errors in the sum of mistakes marked in irrelevant stimuli), E% (proportion of errors made and amount of elements processed), TOT (total amount of elements processed – errors made), TA (total number of correct answers), CON (concentration derived from the number of commissions by marking irrelevant elements correctly marked (TA), minus the number of commissions), VAR (Variation in the difference between the highest and lowest score).

Creative Intelligence Test– CREA (Corbalán, Martínez, Donolo, Alonso, Tejerían & Limiñana, 2003). This has the purpose of assessing creative intelligence through the evaluation of individual creativity, as per the indicator of question generation, in the theoretical context of problem searching and problem solving. The test has a high reliability (0.875) and has the corresponding scales to interpret it that are included in its manual.

Creative Imagination Test – PIC (Artola, Ancillo, Barraca, and Mosteiro, 2004). Creativity is evaluated as the capacity of the subject to formulate questions based on the graphical material provided. It provides data on Narrative Creativity (via flexibility, fluency and originality intermediate variable), Graphical Creativity (via creation, originality, shades and color, special details and title intermediate variables) and overall score for creativity. To

create this test and analyze internal consistency, a reliability study was conducted and a high level was found, via the calculation of the Cronbach coefficient (a= 0,83).

EVHACOSPI. Test for Evaluating Interpersonal Problem-Solving Cognitive Abilities (García Pérez, E.M. & Magaz Lago, 1998). This evaluates the cognitive skills quantitatively and qualitatively in relation to the interpersonal problem solving processes. It measures capacities for Problem Identification, Problem Situation Definition, Alternative Thinking (fluency and range), and Thinking in order to anticipate consequences and Decision-making**.**

Procedure

First, the school psychologists at each center applied the formal instruments to be used for preselecting the giftedness profiles individually for each student. WISC`R Intelligence Test was used, as per the proposals of Renzulli (2005), involving the measurement of intelligence and creativity (CREA and PIC). The subjects needed to have an IQ of 130 or greater, along with possessing creativity features. In addition, the instrument used was Mckenzie (1999)'s MI Inventory (adaptation of Gardner, 1983) and Parent and Teacher Questionnaires were applied (Rogers, 2002) with the objective of knowing the talent of each student to guide the programs in a personalized way, according to the needs of each one. They were applied individually and to small groups, following the counseling of each test in the psychologist´s offices and in the classroom where High Achiever Project activities were performed.

Secondly, the teachers were trained before starting the programs. This training included courses on high capacities, the analysis and the study of the teacher´s guides and all the activities included in each of the programs of the High Achievement Project.

Third, the programs were applied to five groups of six students and one group with seven students with similar intellectual profiles and similar age range. An expert on high capacities observed the teachers while applying the programs and assessed the managers and the teachers through work sessions. Finally, we applied the post-test measures at the end of the programs (attention, creativity, and interpersonal problem resolution).

Datal Analysis

The study followed a pre-experimental design since there was no control group. Consequently, and in order to increase the internal validity of the results, results were measured before and after the experimental process. Prior to the analysis of the effects of the program, a study on the distribution of each of the dependent variables involved in the research was conducted, using the Kolgomorov-Smirnov test. The objective of this initial analysis was to carry out the normality assumption check of the variables as an informative tool for selecting the appropriate statistical test for comparing the groups. In order to analyse the effects of the intervention program in the students, the scores of the various dependent variables were analysed descriptively using central tendency statistics and dispersion. These variables are the dimensions of each of the tests used (D2, CREA, PIC and EVHACOSPI). Secondly, and using the results of the normality results as a reference, a mean comparison was made between the related groups using the T-statistic for Student and W for Wilcoxon. A 95% confidence level indicates the differences are significant.

Finally, we analysed the statistical power of those contrast effects that were significant and also the size of the effect (D of Cohen) of the differences between pre and post-test, thus the statistical results are more complete and adjusted to the study sample. An effect size bigger than 0.5 is considered as differences with medium size, if it is higher than 0.8 the differences are considered big and if it is higher than 0.8 it means that the effect of the treatment would be observed on 80% of the cases. Thus, with this analysis it is also possible to estimate the size of the sample in order to gain statistical power. The different statistical analyses were conducted using SPSS Statistics 21 and the power analysis using G*Power.

Results

Normality test

In order to test the distribution of the different dependent variables we applied the Kolgomorov-Smirnov test that contrasts the normality hypothesis, and the results confirmed the normality for all of the cases. However, the dimensions of the EVHACOSPI test were confirmed, given the qualitative nature and the ordinal measurements of these variables. Therefore, we analyzed the differences between the pre and post-test scores.

Descriptive Study

We calculated central tendency (mean) and dispersion analyses (standard deviation) for all the variables pre and post-test. The descriptive results have been grouped in four tables, one per test applied to the students with high capacity. First, the three dimensions of the D2 test (both pretest and posttest) are presented. The following tables represent the CREA test, followed by the PIC test and finally, the EVHACOSPI test. It is clear from the descriptive statistics that the posttest scores are greater than the pretest scores, but in order to ascertain whether that difference is statistically significant, the results of the T test for Student and W for Wilcoxon need to be analyzed.

Table 1. Descriptive Statistics for D2 Test of attention

	N	Min	Max	Mean	SD
D2: TR_Pretest	22	25	99	73,14	26,908
D2: TR_Posttest	22	35	99	77,27	20,721
D2: TA_Pretest	22	20	99	75,41	28,418
D2: TA_Posttest	22	20	99	72,00	29,510
D2: O_Pretest	22	4	99	65,41	29,431
D2: O_Posttest	22	8	99	47,50	30,144
D2: C_Pretest	22	10	99	48,73	28,904
D2: C_Posttest	22	10	90	35,45	24,295
D2: CON_Pretest	22	3	99	47,95	30,195
D2: CON_Posttest	22	15	99	73,55	29,046
D2: TOTAL Pretest	22	25	99	72,05	27,945
D2: TOTAL_Posttest	22	25	99	72,23	26,237

Note: TR (total of processed elements, reliable measure of a normal distribution of attention, both selective and sustained, processing speed, amount of work done and motivation. E (errors of the sum of mistakes marked for the irrelevant stimuli), E% (percentage of errors and number of elements processed). TOT (total of processed elements – errors). TA (total correct answers), CON (concentration derived from the amount of omissions highlighting the irrelevant elements correctly marked). TOTAL: index of total effectiveness of the test.

The descriptive data in the D2 test show an increased level of the TR variables (Total answers), CON (Concentration), a decrease for TA (Total of correct answers), O (Omissions) and C (Commissions of number of irrelevant elements) and are maintained for the TOTAL (index of the total effectiveness on the test).

Table 2. Descriptive Statistics for CREA Test

	N	Min	Max	Mean	SD
CREA_Pretest	23	10	99	52,70	24,917
CREA_Posttest	23	30	99	71,78	20,798

The increase on the level of performance on the CREA test is considerable, with an average increase of almost 20 points and a higher homogeneity of the scores that is reflected in the distribution of the typical deviation of 4 points.

Table 3 Descriptive Statistics on PIC Test

	N	Min	Max	Mean	SD
CREA GRAL_Pretest	23	30	95	57,39	18,942
CREA GRAL_Posttest	23	40	95	69,35	16,328
CREA NARR_Pretest	23	20	90	54,78	19,913
CREA NARR_Posttest	23	20	95	61,52	19,155
FLUENCY_Pretest	23	4	97	57,22	25,719
FLUENCY_Posttest	23	20	99	59,04	23,229
FLEXIB_Pretest	23	10	95	49,57	28,281
FLEXIB_Posttest	23	15	95	54,35	25,598
ORIGINAL_Pretest	23	10	95	58,48	23,327
ORIGINAL_Posttest	23	30	99	73,61	17,911
CREA GRAF_Pretest	23	4	99	68,52	32,943
CREA GRAF_Posttest	23	50	99	84,30	16,168
ORIGINALID_Pretest	23	15	99	60,61	25,350
ORIGINALID_Posttest	23	25	99	71,43	22,049
ELABORAT_Pretest	23	10	99	68,57	32,221
ELABORAT_Posttest	23	20	99	82,09	22,415
SOMBR COL_Pretest	23	25	99	64,35	30,559
SOMBR COL_Posttest	23	10	99	72,83	29,500
TITULO_Pretest	23	30	98	78,13	21,199
TITULO_Posttest	23	20	99	72,57	31,156
DETAILS_Pretest	23	48	99	85,43	11,893
DETAILS_Posttest	23	60	99	95,00	8,453

The descriptive data of the PIC test show an increase for all the dimensions, both before and after the program, except for “Title” that decreases, given that it is an aspect not included in the working plan. The highest increase occurred for “Originality” and “Graphic creativity” (approximately 15 points)

Table 4. Descriptive Statistics for EVHACOSPI Test

	N	Min	Max	Mean	SD
1.ID EX PRO_Pretest	24	2,00	3,00	2,5833	,50361
1.ID EX PRO_Posttest	27	2,00	3,00	2,8519	,36201
2.DESCR PRO_Pretest	24	,00	3,00	2,2083	,77903
2.DESCR PRO_Posttest	27	1,00	3,00	2,7037	,54171
3. IDEN PRO_Pretest	24	1,00	3,00	2,1250	,74089
3. IDEN PRO_Posttest	27	2,00	3,00	2,8148	,39585

4.GEN ALTER_Pretest	24	1,00	5,00	2,2750	,93682
4.GEN ALTER_Posttest	27	1,66	5,00	2,8063	,98270
5. ANT CONS_Pretest	24	,66	4,00	2,1221	,79212
5. ANT CONS_Posttest	27	1,66	4,00	2,8381	,71317
6. DECISION_Pretest	24	,00	3,00	1,9583	,95458
6. DECISION_Posttest	27	1,00	3,00	2,7407	,52569

Finally, for the EVHACOSPI test we observed an increase in the scores for all the dimensions, particularly in the skills for the anticipation of possible consequences and decision-making. The descriptive study shows changes between the pre and post-test for most of the variables. However, the reduced size of the sample and the nature of some of the tests applied require the use of statistical tests to guarantee that the differences found are significant in a sample of high capacity students. Thus, as well as analyzing the differences between the pre and post-test we tested the strength of the test applied.

Pretest-Posttest Comparisons

In order to study the effect of the manipulation used with gifted students and compare the hypotheses raised, a comparison was made between the related groups. This comparison was conducted using two different statistical tests. The T test for Student for those dependent variables with a normal distribution (D2, CREA and PIC) and the W test for Wilcoxon for variables that do not fulfil this assumption (EVHACOSPI). The comparisons conducted through the T test estimate the significance of the difference between the pretest and posttest means. In contrast, the W test is based on ranges, but the interpretation is similar to a mean difference, that is, a larger range is equivalent to a greater level in this measurement of the variable. To confirm the differences between the pretest and posttest scores, the probability associated with the T statistic for Student and W for Wilcoxon must be less than 0,05 and in order to improve the identification, we have indicated in bold those that are significant.

Table 5. Pretest-Posttest Comparisons for D2 Test

		Dif. Means	ET. Dif. Means	T	GL	P	D Cohen
Pair 1	D2: TR_Pre - D2: TR_Post	-4,136	2,3	-1,798	21	0,087	
Pair 2	D2: TA_Pre - D2: TA_Post	3,409	4,409	0,773	21	0,448	
Pair 3	D2: O_Pre- D2: O_Post	17,909	7,411	2,417	21	**0,025**	**0,515**
Pair 4	D2: C_Pre - D2: C_Post	13,273	4,483	2,961	21	**0,007**	**0,631**

Pair 5	D2: CON_Pre - D2: CON_Post	-25,591	6,313	-4,053	21	**0,001**	**0,865**
Pair 6	D2: TOTAL_Pre - D2: TOTAL_Post	-0,182	3,967	-0,046	21	0,964	

In the D2 test, the dimensions with significant differences between pretest and posttest are O, C and CON. The positive differences, as it is the case of O and C indicate a decrease on the posttest scores. For the O, the size of the effect is 0.515 and the power is 0.635, thus, it would be necessary to increase the size of the sample to 35 participants to obtain a power effect of 0.8. The difference in the variable C has an effect size of 0.631 and statistical power of 0.806, thus 22 participants in the sample are sufficient to have a significant effect on at least 80% of the times. The variable CON shows a significant increase on the posttest of (T=6,313; p=0,001), with a big effect size(d=0.865) and statistical power of 0.971, thus in this case the size of the simple allows us to identify the effect of the treatment.

Table 6. Pretest-Posttest Comparisons for CREA Test

		Dif. Means	ET. Dif. Means	T	GL	P	D Cohen
Pair 1	CREA_Pre - CREA_Post	-19,087	2,773	-6,884	22	**0,000**	**1,435**

The students displayed a significant increase of 19 points on the CREA test score, the size of the effect being1435 with a power value of 1, the maximum possible.

Table 7. Pretest-Posttest Comparisons for PIC Test

		Diff. Means	ET. Dif. Means	T	GL	P	D Cohen
Pair 1	CREA GRAL_Pre - CREA GRAL_Post	-11,957	3,44	-3,476	22	**0,002**	0,725
Pair 2	CREA NARR_Pre - CREA NARR_Post	-6,739	3,153	-2,137	22	**0,044**	0,446
Pair 3	FLUIDEZ_Pre- FLUIDEZ_Post	-1,826	3,572	-0,511	22	0,614	
Pair 4	FLEXIB_Pre - FLEXIB_Post	-4,783	3,604	-1,327	22	0,198	
Pair 5	ORIGINAL_Pre- ORIGINAL_Post	-15,13	4,314	-3,507	22	**0,002**	0,731
Pair 6	CREA GRAF_Pre - CREA GRAF_Post	-15,783	5,893	-2,678	22	**0,014**	0,558
Pair 7	ORIGINALITY_Pre - ORIGINALITY_Post	-10,826	3,398	-3,186	22	**0,004**	0,664
Pair 8	ELABORAT_Pre - ELABORAT_Post	-13,522	5,674	-2,383	22	**0,026**	0,497
Pair 9	SOMBR COL_Pre - SOMBR	-8,478	3,748	-2,262	22	**0,034**	0,471

	COL_Post						
Pair 10	TITULO_Pre - TITULO_Post	5,565	6,226	0,894	22	0,381	
Pair 11	DETAILS_Pre - DETAILS_Post	-9,565	1,892	-5,055	22	**0,000**	1,05

On all the dimensions of the PIC test, with the exception of Fluency, flexibility and title (due to the lack of time spent working on creative tasks), there are significant differences between pretest and posttest. In this case, all of them are in favor of the posttest, although with different magnitude. The greatest of these differences can be observed in DETAIL variable, with a score over 1, and its statistical power reaches the maximum value (B=0.998). The differences found for the CREA_GENERAL, ORIGINAL and ORIGINALIDAD also have an acceptable statistical power, above 0.8 in all the cases. However, in order to assure the changes produced by the treatment in the variables CREA_NARRATIVE (B=0.553), CREA_GRAFIC (B=0.725), ELABORATION (B=0.625) and SOM_COL (B00.579) it would be necessary to increase the size of the sample.

Due to the lack of normality of the data distribution and the small sample size, in order to compare the pre and posttest results for the variables in the EVHACOSPI we used the s no parametric W of Wilcoxon, which compares ranges instead of mean scores. A range is the product of the transformation of the scores of the variable to carry out a no parametric analysis. It involves sorting the values from the smallest to the biggest, and the smallest value would get the range 1 and so on. After this step, the ranges are compared between the pre and posttest. There are three different possibilities:

- Negative ranges (N.R.): the scores in the pretest is higher than for the posttest.
- Positive Ranges (N.R.): the scores in the pretest are lower than for the posttest.
- Tied (T): the scores are equal both in the pretest and the posttest.

Table 8. Pretest-Posttest Comparisons for EVHACOSPI Test

		N	Average Range	Z	P	D Cohen
1.ID EX PRO_Post - 1.ID EX PRO_Pre	Negative Ranges	0	,00	-2,449	**0,014**	**0,607**
	Positive Ranges	6	3,50			
	Ties	18				

	Total	24				
2.DESCR PRO_Post - 2.DESCR PRO_Pre	Negative Ranges	3	6,50	-2,45	**0,01**	**0,559**
	Positive Ranges	12	8,38			
	Ties	9				
	Total	24				
3. IDEN PRO_Post - 3. IDEN PRO_Pre	Negative Ranges	2	8,50	-3,26	**0,00**	**0,875**
	Positive Ranges	16	9,63			
	Ties	6				
	Total	24				
4.GEN ALTER_Post - 4.GEN ALTER_Pre	Negative Ranges	3	12,83	-2,28	**0,02**	**0,468**
	Positive Ranges	16	9,47			
	Ties	5				
	Total	24				
5. ANT CONS_Post - 5. ANT CONS_Pre	Negative Ranges	0	,00	-3,64	**0,00**	**0,712**
	Positive Ranges	17	9,00			
	Ties	7				
	Total	24				
6. DECISION_Post - 6. DECISION MAKING_Pre	Negative Ranges	1	12,50	-2,95	**0,00**	**0,793**
	Positive Ranges	15	8,23			
	Ties	8				
	Total	24				

We found statistically significant differences between the scores in the pretest and the posttest for all the variables in the EVHACOSPI test, and there is an increase in the scores for the posttest for the majority of the participants in the sample. The analysis of the size of the effect shows that the difference occurs for the variable IDEN_PRO (d=0.875) and the contrast reaches a statistical power of 0.979. Thus, we can suggest that the differences would occur almost in 100% of the times. For the variables ANT_COMS and TOMA_DEC it is similar, the statistical power reaches scores over 0.9. However, for the variables ID_ES and DESCR_PROP it would be necessary to increase the size of the sample in order to confirm the differences found, although the values are near to the acceptable values (B=0.793 and B=0.725). Finally, the variable GEN_ALTER shows the lowest effect size (d=0.468) and its statistical power is 0.572. Thus, it would be necessary to include at least 40 cases to confirm the differences found between the pretest and the posttest.

Discussion

The results confirm the hypotheses tested and are in accordance with prior research on attention, creativity, and interpersonal conflict resolution.

Attention

In this study, the first hypothesis to be addressed was as follows: (1) There will be a significant difference in the form of an increase of attention after performing the High Achiever programs, because the intellectual, creativity and cooperation abilities may provide the appropriate setting for stimulating learning based on their particular needs (Jiménez, 2000). The results after performing the High Achiever programs revealed significant differences in attention in terms of the total number of answers attempted, productivity, total number of correct answers, in commissions or commission errors, related to inhibitory control, in concentration and in the total of the sample and they are in accord the results of other studies, such as those of Shi, Tao, Chen, Cheng, Wang, Zhang (2013) and Jiménez (2000), who state that gifted students maintain better concentration throughout the learning process and improve when provided with a learning setting that meets their particular needs. The results of significant improvement in attention through the completion of the High Achiever programs furthermore demonstrate that erroneous diagnostics could be avoided in those cases where attention-deficit and hyperactivity behaviors could be confused with giftedness (Lawler, 2000). This could jeopardize the progress of these types of students in educational centers because this could lead to improper treatment. This possibility is reflected in the studies that have demonstrated how in those cases when the subject seems to be hyperactive and is actually gifted (Moon, Zentall, Grskovic, Hall, Starmont & Spurgin, 2001) the diagnosis of this giftedness may be delayed (Moon, 2002), and the educational needs of these subjects may not be addressed accordingly.

Creativity

The second hypothesis concentrates on the fact that creativity will increase significantly after completing the High Achiever programs. The results appear to confirm this hypothesis, since significant differences were observed in *general creativity, graphical creativity in originality, creation, color shades and details.* These results are compatible with those generated from studies conducted on creativity that indicate the need for a stimulating environment in which to develop creative potential (Lubart, et al., 2003). Furthermore, clear improvements were obtained in fluency and flexibility of narrative creativity, even though no significant differences were obtained. This may be due to the fact that creativity occurs in some specific, but not all, fields (Gardner, 1983). The significant improvement in creativity may reflect the existing relationship between creativity and what was performed in school and

the need to include the development of creative abilities in the educational setting (Dillon, 2006).

Interpersonal Conflict Resolution

The results of the study confirm the hypothesis of significant differences of improvement in interpersonal problem resolution after completing the High Achiever Project programs (hypothesis 3), in *Problem Identification, Problem Situation Definition, Alternative Thinking (fluency and range), Thinking in order to anticipate consequences and Decision-making*. Cooperative learning, incorporated in the Cooperation Program, improves both participation among the students and interaction between groups in the class (Higgins el al., 2011), and consequently, interpersonal conflict resolution abilities will be developed after completing the cooperative activities programs of the Higher Achiever Project. Furthermore, students respond better to pedagogical methods that respect their preferred learning style (Lee & Li, 2008; Zhang, 2008) along with those methods that enhance the school setting for gifted students (Coleman, 2003), or by applying the enrichment programs or regrouping to include creativity (Lautrey, 2004), since creative programs provide a better overall environment (Sternberg, 2003).

It is important, furthermore, to highlight the importance of teachers receiving the training required for dealing with gifted students, with a clear conception of creativity and sufficient preparation for fully taking advantage of the creative opportunities in the classroom (Newton & Newton, 2010); otherwise it may be difficult to apply the creative activity (Salk, 2004). Thus, the study plan for future teachers should include technical training and the practice required for addressing gifted students at the educational level (Csiekszentmihalyi & Wolfe, 2004).

Conclusions

The objective of this research was to provide a project for gifted students, via enrichment programs that can be performed at the school level, through the application of the High Achiever Project. The three hypotheses in relation to improved attention, creativity and interpersonal problem resolution were confirmed and the methodology used from the quasi-experimental design, through the application of pretest and posttest, have proven to be adequate and lead to the following conclusions.

1) This study clearly demonstrates that gifted students that performed the High Achiever Project programs showed significant improvements in attention, creativity and interpersonal conflict resolution.

2) Improved attention in these types of students improves satisfactory diagnoses and avoids the confusion that may occur related to attention-deficit and hyperactivity issues, although it would also be necessary to take into account other variables that influence the hyperactive students.

3) Creativity and cooperation programs favor the classroom environment to provide the educational responses demanded by gifted students.

In summary, we can conclude that the intervention program at the *expanded curriculum* level can be implemented in order to exercise higher intellectual abilities. *Creativity Programs* (which take into account the interests of students with multiple intelligences and are related to the school curriculum) include tasks related to the creative process phases including Increased awareness, incubation, insight, and verification. These programs, along with the *Social and Cooperation Ability Programs*, may all address the needs of Gifted Students at the educational level.

Limitations

This study has some limitations, such as the size of the sample. At the international level, it is believed that approximately 2.5% of students can be classified as gifted, which makes it more difficult to obtain a larger sample. In our case, we started the study with 42 students, which fell to 30, with our final simple being composed of 22 cases.

We could not work with a control group. Educational centers provided the application of tests and collaborated with the research, but it was only possible to secure the involvement of six educational centers for implementing all of the phases included in the pretest test application, the application of the programs for six months and the application of the posttest tests. An educational center applied the pretest and posttest tests without applying the intervention programs and we could thus not use the data because they were not appropriate for comparison with the experimental group.

Prospective

The study conducted provides a starting point for continuing to contribute resources, application programs, and educational practice for gifted students. Future work could take the form of studies that focus on applying the High Achiever Project to cooperative groups, enrichment of activities with instruments and technology programs, incorporation of specific subjects to the study plans for training teachers and professors and proposals for parent counseling. In summary, this study provides new channels and programs for addressing the needs of gifted students at the educational level, and contributes to improving the quality of education in order to develop the full potential of students in the actual school setting.

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ANEX I

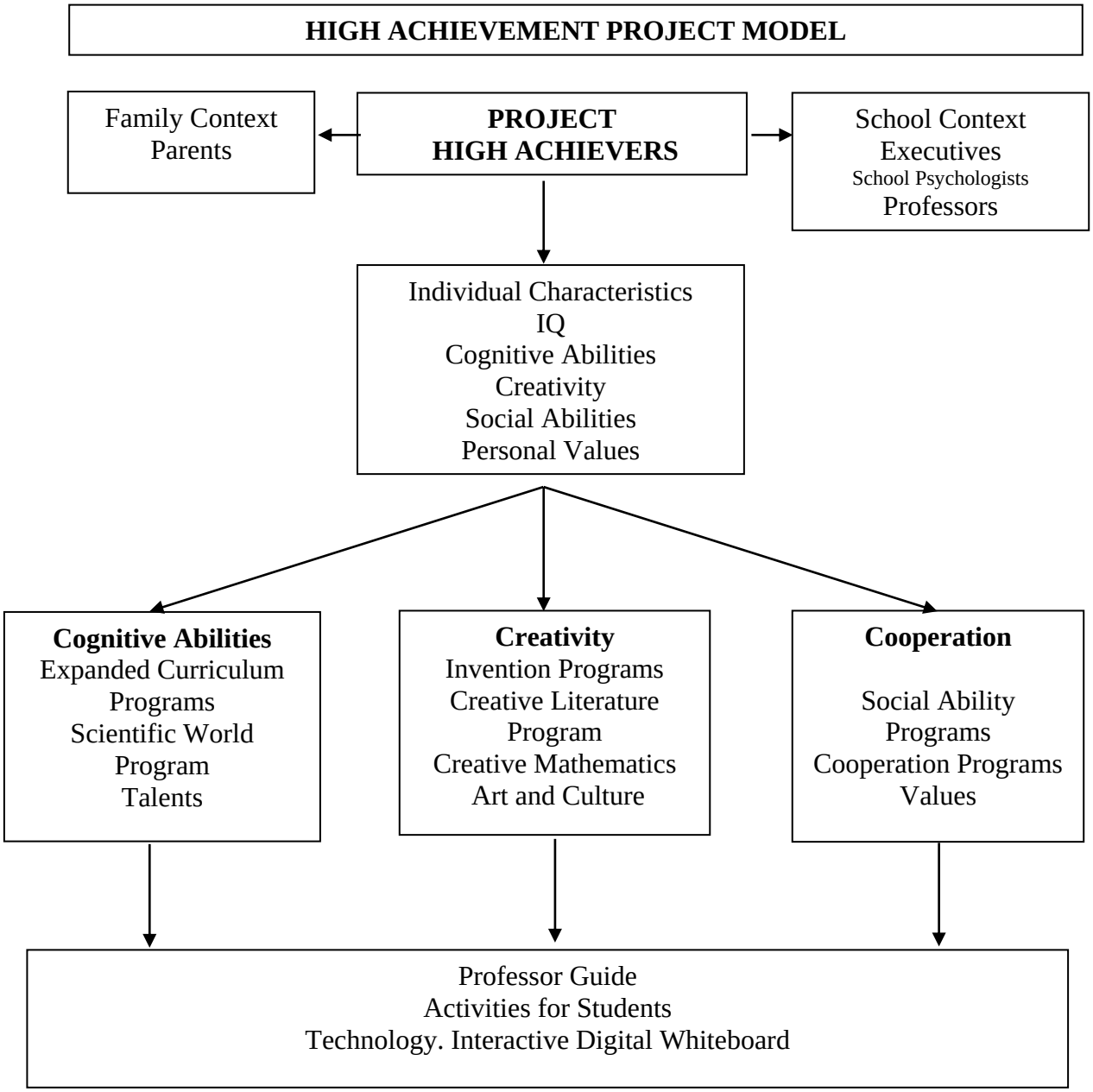

Figure 1. High achievement Project model