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MATHEMATICALLY GIFTED STUDENTS: THEIR CHARACTERISTICS AND UNIQUE NEEDS

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Abstract:
The present study deals with the unique needs of mathematically gifted students. This topic is important because of the need to understand to depth the unique needs of these students, the learning characteristics tailored to them, as well as their preferences regarding learning and their relationships with other students and with their teachers. The main purpose of this study, as mentioned earlier, is to identify the unique needs of mathematics gifted students, measure their specific preferences in various aspects of learning, as well as about their relationships with their teachers and other students. This, in order to establish a broad and deep background to enable a unique reference to the population of gifted students and allow the construction of appropriate educational programs, care and interventions tailored to their needs, while integrating the educational staff at the school. The present study is a combined one, with a quantitative and qualitative measures, and has two hypotheses: gifted students' perceptions of the teachers will be different from the non-gifted students; differences will be found in the needs of gifted students compared to non-gifted students in unique learning programs at school. To examine the hypotheses 100 students were sampled, 50 gifted and 50 non-gifted students. The instruments included a questionnaire used before in this area of research, as well as an interview built for the purpose of the present study. The results showed that indeed there are differences between gifted students and non-gifted students in many ways and preferences, such as learning pace preference, preference for collaborative learning, curriculum content preference, preference for complexity and preference for type of interaction with the teacher. The findings are compatible with previous studies in the field and emphasize the importance of the reference for gifted students in a unique way.

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1. Introduction; Goals and Importance of the Research and its Contribution

Meeting the unique needs of the gifted students, and the construction of unique programs as well as nurturing the students' unique skills, became in the highlight of the Ministry of Education in recent years. Different studies use different definitions for giftedness. One of the main divisions of these approaches is the division and distinction between the quantitative approach and the qualitative approach. According to the quantitative approach, giftedness is defined by intelligence tests as a general intellectual ability. In comparison to this approach, the advocators of the qualitative approach emphasize the affiliation between the cognitive components and the social, environmental, and emotional components, and claim that the totality of the components sets the individual's function level and the affinity actualization quality between all of the components (Wargen, 2006). The Ministry of Education chose the quantitative definition, and it manages the diagnosis system in accordance to this approach, hence, the tests detecting gifted students check general intellectual skills and students with a high potential for intellectualism are selected, and they are directed to unique programs of care and enrichment compatible to their skills in this field (Wargen, 2006).

This research mainly treats the topic regarding the gifted and non-gifted students' perceptions of learning programs, ways of learning, and the teachers' attitudes. This, in order to gather information about the special needs of the gifted students, which is the main purpose of this research. The research focuses on mathematical giftedness and examines the unique needs of the mathematically gifted students.

In relation to the teachers' perceptions, it seems that the perceptions of the teachers and their interaction with the gifted students have a great affect over the students' experience, both in learning and from a personal aspect (2012 Wai, Makel, Putallaz), hence, it is important to know in what way the teachers' perceptions are reflected in the students' point of view and experience. Regarding the learning characteristics of gifted students, it is also important to note that, the learning characteristics relating to gifted students are unique and include additional aspects beyond the regular learning characteristics in educational settings, these unique characteristics includes, among others, learning in a different pace, further advanced materials, a higher level of analysis and higher scholastic requirements (Dori and Zohar, 2008).

In this view you, it can be seen that there is a special importance to the exploration of the field of giftedness, and specifically to the mathematical giftedness, a

field which relatively has been little explored in recent years. The main contribution expected from this research is identification and detection of the students' needs and understanding their experiences according to their testimonies as well as their feelings and personal experiences. This research may contribute to every educational intervention regarding the field of the gifted.

Hence, the main goal of this research is to identify the unique needs of the mathematically gifted students, to deeply understand the learning programs fitted to them, by examining the perception of the gifted and the non-gifted students. This is, in the purpose of basing an extended and in-depth background in order to enable a unique treatment to the gifted students' population and to enable construction of compatible teaching, nurturing and intervention programs, while combining the school's educational staff.

The significant of this research derived from its uniqueness and pioneer quality both in the national spectrum (in Israel) as well as the sectoral spectrum (the Arab), so there is nearly no extensive evaluation researches for nurture programs to gifted individuals in Israel. Shani (2008), notes two possible reasons for the low extent of research in the field of evaluating giftedness: First, there are almost no researchers who specialize in the field of giftedness, as it is indicated by the small amount of academic research papers on the subject, such as thesis and doctorate papers. A close and mutual connection between the gifted department and the academic institutions, between the research and actualizing practically, is one of the recommended directions for improving education for the gifted. Second, it seems that the way of operating the nurture programs makes the performance of extensive evaluation researches difficult. Hence, according to some of enrichment centers' managers whom I conversed with, enrichment programs for the gifted in enrichment centers, almost exclusively count on the center's manager's consideration, which changes from time to time. The selection of various courses is usually not subjected to regulated instructions of the department. Thus, this research is of a great significance.

2. Giftedness, what is it exactly?

The concept of giftedness is perceived as a concept that articulates the highest level of intelligence determined by IQ tests. However, it is actually a much wider concept, which refers to an alignment which is both cognitive and emotional, that includes unique developmental aspects, as well as familial and social aspects (Tamir, 2012). David (1997 A) noted that gifted students are children with special abilities, characteristics and learning needs that are different from those of normal students. New and wide definitions for giftedness were later suggested, that include more diverse aspects of function, among these definitions, Guilford's definition (1956) elaborated and included another dimension of giftedness; creativity.

Guilford distinguished between two thinking modes: a focused thinking and a logical and oriented thinking, measured by intelligence tests and divergent thinking-problem solution as a process of fluency of ideas, flexible and original thinking. Additionally, one of the liberal definitions is that of Witty (1958). His definition is the most inclusive and diffusive definition, according to which, a gifted child who excels in every human activity. In the seventies, Marland (1972) suggested an extended definition that includes six elements: General intellectual ability, a specific academic ability, creative thinking, leadership, ability in arts and a psycho-motoric ability. According to him, the gifted child can excel in one field or more, not necessarily in all of them. This definition was accepted by American Ministry of Education and passed legally by the congress.

Numerous theories in the research field about giftedness try to find other factors beyond cognitive ability. According to these theories, the interaction between different factors, rather than the factors themselves, is what would lead to the actualization of the giftedness. According to Renzulli's (1987) definition, giftedness is a product of interaction between three clusters of qualities: 1. A high cognitive ability 2. Persistency in tasks ability 3. Creativity. Renzulli (2004) also believe that if the gifted individual will have the following qualities, his or her chances to actualize their giftedness will increase and they will become great creators who contribute to society: optimism, humanism, being attracted to a subject or self-discipline, mental and physical strengths, a vision and a sense of mission.

The researchers Nancy Robinson and her partners (Reis, Neihart, Robinson & Moon, 2002), describe in their book's preface *The Social and Emotional Development of Gifted Children, What Do We Know?* In what way gifted individuals are a heterogenic group that comes from all ethnic, socio-economical groups, and from every nation, and in what way they have different character qualities in temperament, the ability to dare, internalization and externalization inclinations etc. on the other, the starting point in the integrative and a little inclusive understanding of these children, is in the understanding of the existence of asynchronous in the gifted child's development, which is based on the accelerated development of certain abilities in comparison to a "normal and average" development of his or her other abilities. This situation produces dynamic complexity, in which the accelerated abilities constitute a source for general admiration of the child on the one, but on the other, they might create a wide internal gap between the "good" parts, those admired, and the "not as good" parts recognized by him and his environment.

Many parents of gifted children describe the different development process characterizes these children right from the start, as well as their outstanding abilities and skills (Marland, 1972). Many of them present outstanding language skills in a very early age, including; fast speech development, usage of a rich vocabulary, a clear and focused expressiveness, asking "smart" questions including a personal view,

conclusions etc., as well as children whom taught themselves to read different languages, or those who deal with arithmetical challenges relatively more difficult for their age group, such as complex addition and subtraction exercises (counting thousands) in kindergarten, or acquiring deep general knowledge in unique content fields such as: dinosaurs, the solar system, different countries and vehicles (Tamir, 2012).

Thus, the developmental image created, which characterizes many of these children, is of a rapid development in any cognitive field, mostly lingual or digital, next to a similar development in other fields, that is experienced as inferior in comparison to other great functions. It means that in gifted children, there is a gap between a particular mental ability that develops very rapidly, relatively to the chronological age, and the emotional development and/or other qualities the develop averagely. This gap is a manifestation of the non-synchronization development, which reflects the incompatibility condition in the intra-personal level as well as in the interpersonal level – in comparison to other children (Tamir, 2012).

Indeed, from a young age, the gifted child learns that he is being treated differently due to his high capabilities, though often, he receives conflicting and confusing messages regarding what is expected of him as a gifted child. Many parental and social expectations are related to the assumption that intelligence is static and the child is expected to maintain a succession of successes (Cross, 2011). Hence, at the intra-level the gifted child learns from a young age that there are "parts" of him that receive great appreciation from society (parents, the nanny, the kindergarten teacher, let alone grandma and grandpa…) evaluation that is expressed by admiration and pride.

The early systematic researches about gifted children started in the early 20's, in parallel to IQ tests (Knudson, 2006). The first main research was conducted by Tharman between 1921-1960. In that research, about 1000 gifted children in the ages of 2-13 whom their IQ level, according to Stanford's intelligence test was 140 up, got tested. These children were tested by a large number of physiological, cognitive, and social parameters. The purpose of this extensive research, as well as other studies conducted in this field in the recent decades, was to test unique characteristics of gifted children, who were not tested extensively earlier (Bloom, 1983). In our research, as mentioned in the introduction, the focus is on mathematically gifted children. Hence, in the next section we treat this specific field.

3. The gifted and the excelling

One of the most important distinctions in this context is the theoretical – empirical distinction and that of the school system between the gifted and the excelling. The approach used by the Israeli school system today, when it wishes to detect gifted and excelling children, is the quantitative approach, according to which; gifted and excelling

children are measured by the same sequence, when the difference between the groups derived from the percentage which they belong to. This approach is different from the qualitative approach, according to which, as been said; gifted children present characteristics that are qualitatively different from those of the normal students (Rogers, 1986; Nevo 1997). Deciding on the differentiating sectional point is actually arbitrary and the majority of the essential characteristics are mostly not counted on, and thus, the quantitative definition, as much as it is deriving from applicable needs of a large system, it does not succeed in pointing out the essential differences between the groups, as it can be seen in a large number of researches. For instance, the groups are differentiated to a great extent in the aspects of; motivation, fields of interest, intellectual creativity and achievements in school.

Renzulli (1986) differentiated between two kinds of gifted performance; schoolhouse giftedness; characterized by how easy it is to the student to acquire knowledge and a learning and testing skill, and it is largely evident by high grades in school's tests. In comparison, creative-productive giftedness includes creation of ideas and new products that are influential in a certain field of knowledge. This differentiation is parallel, in my view, to the distinction between the gifted and the excelling when the excelling manifest schoolhouse giftedness, whereas the gifted are more characterized by creative-productive giftedness. Similarly, Simonton (1996) differentiated between students who "receive expertise" and dominate very well in a certain field, acquire skills and work in accordance to the field's rules, however they do not go beyond that, in comparison to students who do not only dominate a certain field and know its rules but rather they can also break the rules or create new ones; "creative expertise". Here as well, the first group of students is compatible to the wide spread concept of excelling students, while the students who are perceived as creative experts, match to the gifted students' characteristics. Both groups of students share similar characteristics of intellectual abilities, but still, from the thinking mode aspect, there are significant differences.

The excelling present, for instance, a conventional approach to do tasks, whereas the gifted present a creative-unique approach (Dai & Feldhusen, 1999). Hong and Aqui (2004) claims that the gifted from a "schooling aspect" (similarly to our definition of the "excelling"), and the creative gifted students (meaning our definition of gifted) differentiate from each other significantly in aspects such as cognitive and motivation characteristics deriving from the kind and the level of the interest, and from the curiosity they have for their environment. Finally, Hong and Milgram (1996) treated to four differentiated central kinds of giftedness: general intellectual ability ("gifted"); and academic ability ("excelling"); general cognitive creativity, a creative talent in a specific field. The different capabilities are not necessarily related to one another and actually they are not measured in similar ways. The distinction between the two groups should affect the indicators of the detection as well as on the indicators of the nurturing

programs. Indicators of nurturing the excelling students can be principally one dimensional (promoting and measuring achievements), while the indicators for nurturing the gifted, that this review particularly focuses on, are obligated to be multi-dimensional and to include wider aspects of intellectual capability and potential realization.

4. Mathematically Gifted Students: characteristics and needs

Mathematical giftedness has many definitions (David, 1997B). If it is about the early childhood, defined in literature as pre-school ages, then most of the children whom are conventionally defined as mathematically gifted, were not officially diagnosed. Nonetheless, a toddler of eighteen months who announces aloud when inside an elevator each floor it gets close to, a two-year-old who counts to 20 and up with no error, a three-year-old who understands the meaning of deduction, a four-year-old who understands the meaning of a negative number, are not imaginary kids. From here it seems, that at least in early age the importance of an "operative definition" when it comes to mathematical giftedness is not great (Clark, 2008). Though, what is important is that the understanding of the phenomenon by educators, parents and mental health caretakers as well as its identification will allow to provide help and support to the child and to his or her family when the child is not in a familial and social surrounding that enables an appropriate treatment to his or her special needs (David, 2009).

Indications to mathematical giftedness, includes among others; an extraordinary curiosity for numbers and mathematical information, a capability to understand and implement mathematical concepts quickly, a distinctively high ability to recognize patterns and abstract thinking, flexibility and creativity in strategies for problem solution, an ability to move mathematical concept to an unfamiliar situation, as well as tenacity in solving challenging problems (Stepanek, 1999). Bicknell and Holton (2009) noted that mathematical giftedness can be manifested in three ways: The first is the analytic mode; mathematically gifted students who expert in it tend to think abstractly easily. They figure out problems by using logic and thought. The second is the geometric mode; these gifted students will prefer to use sketches and visual aids to figure problems. The third is the harmonic mode, which presents the gifted students who are capable to use both ways mentioned above, the analytic and the geometric.

It is also important to mention the gender issue regarding the mathematically gifted females. The question arises: why everything is in masculine form? Well, because the absolute majority of the mathematically gifted are boys. Hence, the acceleration programs of Johns Hopkins University contained 16 times more boys than girls, regarding children younger than 13 who have scored 700+ in the American SAT's mathematical section (Benbow, Lubinski, Shea & Eftekhari-Sanjani, 2000). The image concerning the situation in Israel is substantially different (David, 1997A, 1997B, 2005),

in Israel there are significantly larger differences between genders in mathematical achievements when it comes to the population as a whole (David, 2001, 2002).

After generally attending to giftedness and to mathematical giftedness specifically, it is important to understand how to detect the gifted, what are the criterions and what stages the students need to pass in order to be detected as gifted. This will be the focus in the following chapter.

5. Questions and Assumptions of the Research

In light of the literature review presented in the chapter above, and in view of the research's goals, two main questions that this research inquires to answer arise:

1. What are the unique needs of gifted students?
2. Are there any differences between the needs of the gifted students and the non-gifted students in relation to unique learning programs at school, and if there are, what are they?

Based on these questions it may be assumed that:

1. Differences would be found between the needs of the gifted students and the non-gifted regarding unique learning programs at school.
2. The gifted students' perceptions of the teachers will be different than those of the non-gifted students.

6. Methodology

6.1 The research's population and a sample

The research's population are gifted students who study in middle-schools. This research sampled 100 students who were detected as having a high level of intelligence by accomplishing high scores in intelligence tests and they are defined as gifted students in accordance to the definition of the Israeli Ministry of Education, in contrast and for a comparison, a control group of 100 normal non-gifted students has been made.

6.2 Tools of the Research

This research used a structured questionnaire and a composed interview for gathering the data.

6.2.1 The students' preferences questionnaire: for examining the students' preferences regarding the school contents, learning methods and learning relations, the students' preferences questionnaire has been used, which was also used in Kanevsky's (2011) research about diagnosing the gifted students' needs. In that research, it seems that the questionnaire is a reliable and a valid tool for measuring students' preferences

regarding their learning. The questionnaire contains a variety of phrases that refer to each of the following categories: content, learning program, learning pace, cooperative learning, type of activities, teacher-student relationship, the teaching program in the school. The questionnaire includes phrases that the students need to note if they agree or disagree with the phrase. For validating the questionnaire in the chosen population, a preliminary pilot study has been held in which the questionnaires were given to 10 gifted and normal students. The pilot research checked the extent of the compatibility of the students' answers to the research literature in the field. It was found that the phrases indeed check what they are meant to check and the findings of the students' answers are compatible to the literature in the field. In addition, the questionnaire was presented to educators who practice teaching and educating gifted students, and these valuators pointed out and noted the compatibility of the tool to the research's goals as well as to the world of content of the inquired issue.

6.2.2 The students' perceptions interview: In addition to the questionnaire, a semi-structured interview was constructed in order to gather more experiential and subjective data from the students. The interview included nine items that collected personal information about the students, information about their learning characteristics, the problems they counter, and their perception regarding the evaluation they receive.

6.3 Examining the assumptions and the findings

Since the current research is a combined research, with both quantitative and qualitative research tools, the method of analysis will combine the findings that came up from the quantitative and from the qualitative analysis, and the findings will be presented in accordance to the research's assumptions:

A. Examining the first assumption of the research

The first assumption of the research referred to the differences between gifted and non-gifted students regarding their needs for the process of learning and this is while gathering information in relation to their preferences regarding the different aspects of the learning field. According to which: **differences will be found between the needs of gifted students and non-gifted students regarding their preferences of unique learning characteristics at school.** The findings of the questionnaire will be presented below as divided to subfields of the students' preferences regarding the variety of the characteristics connected to learning and relationships within the educational framework.

Table 1: Comparison between gifted and non-gifted in accordance to their learning pace preferences

I like	Answer	Segmentation (%)		χ^2
		Gifted (100)	**Non-Gifted (100)**	
To do a task with a partner of my choice	Agree Disagree	85% 15%	80% 20%	0.866
To do a task with a partner that learn at the same speed as mine	Agree Disagree	25% 75%	65% 35%	32.30***
To do a task with a partner that learns much more quickly than me	Agree Disagree	17% 83%	78% 22%	74.60***
To sit in the corner away from everyone and do the tasks	Agree Disagree	21% 79%	73% 27%	54.30***

***p<0.001

Inspection of the table above indicates that 85% of the gifted students and 80% of the normal students, report on their preference to learn with students on the same pace as them, without a distinct difference between the groups (χ^2 = 0.866,N.S). Seems that there is a distinct difference between the gifted students (25%) and the normal students (65%) that agree on the extent of difficulty and time duration when learning a new term (χ^2 =32.30,p<0.001). Thus most of the gifted students report that they do not need a long time to think on a new term that is difficult to understand; moreover, only 17% of the gifted students in comparison to 78% of the normal students agree about the need to make a lot of practice in order to understand a new and difficult term, with a distinctive difference between the groups (χ^2 = =74.60,p<0.001), gifted student do not need a lot of practice. Finally, 21% of the gifted students in comparison to 73% of the normal students expressed agreement on the preference of thinking a long time on ideas before beginning to work on a certain task, with a distinctive difference between the groups (χ^2 = 54.30, p<0.001), meaning, gifted students do not need a long time to think about ideas before they begin to work on a certain task.

Table 2: Comparison between gifted and non-gifted students in accordance to their preferences regarding cooperative learning

I like	Answer	Segmentation (%)		χ^2
		Gifted (100)	Non-Gifted (100)	
To do a task with a partner of my choice	Agree Disagree	68% 32%	56% 44%	3.06
To do a task with a partner that learn at the same speed as mine	Agree Disagree	88% 12%	61% 39%	19.20***
To do a task with a partner that learns much more quickly than me	Agree Disagree	24% 76%	18% 82%	1.08
To sit in the corner away from everyone and do the tasks	Agree Disagree	76% 24%	59% 41%	6.59***

p<0.01,*p<0.001

The table above shows that there is not a distinctive difference between the gifted students and the normal students regarding the preference to do a task with a partner of his choice. Though there was a difference regarding the preference to do a task with a partner that learns at the same speed of the students, hence, the gifted students rated their agreement (88%) to this saying higher than non-gifted students (61%) with a distinct difference between them (χ^2 =19.20,p< 0.001). Furthermore, no distinctive difference has been found regarding the students' preference to study with a partner that learns faster than them. But a distinctive difference has been found in their wish to sit in the corner and to do tasks (χ^2 =6.59,p< 0.01) , gifted students are more agreeable to sitting in the corner away from everyone and to do the task.

Table 3: Comparison between gifted and non-gifted in accordance to their preferences of the school program

I like	Answer	Segmentation (%)		χ^2
		Gifted (100)	Non-Gifted (100)	
To do a task with a partner of my choice	Agree Disagree	91% 9%	24% 76%	91.80***
To do a task with a partner that learn at the same speed as mine	Agree Disagree	89% 11%	83% 17%	1.50
To do a task with a partner that learns much more quickly than me	Agree Disagree	99% 1%	63% 37%	42.10***
To sit in the corner away from everyone and do the tasks	Agree Disagree	19% 81%	73% 27%	58.70***

***p<0.01

Tablet 3 indicates that there is a distinct difference between gifted students (91%) that prefer to learn new subjects that are not included in the school program whereas non-gifted students (24%) much less (χ^2 = 91.80,p<0.001). In addition, there is a distinct difference how the gifted students prefer much better (99%) in comparison to normal students (63%) regarding the understanding of how and why things happen (χ^2 =42.10,p<0.001). Regarding teaching the material from a book there is a distinct difference between gifted students (19%) in comparison to normal students (73%) in relation to their level of agreement to this characteristic of learning (χ^2 =58.70,p<0.001). There was no difference between the groups regarding their preference in relation to the combination of computers and technology within the school program.

Table 4: Comparison between gifted and non-gifted in accordance to their preferences regarding solving complicated problems

I like	Answer	Segmentation (%)		χ^2
		Gifted (100)	Non-Gifted (100)	
To do a task with a partner of my choice	Agree Disagree	84% 16%	3% 97%	120.00***
To do a task with a partner that learn at the same speed as mine	Agree Disagree	91% 9%	63% 37%	22.10***
To do a task with a partner that learns much more quickly than me	Agree Disagree	69% 31%	53% 47%	5.38
To sit in the corner away from everyone and do the tasks	Agree Disagree	78% 22%	39% 61%	31.30***

***p<0.01

Inspection of table 4 reveals a wide gap between the two groups regarding the preference to find different solutions to difficult problems, thus 84% of the gifted students prefer to find different solutions to difficult problems while only 7% of the normal students prefer it, hence, it is a distinctive difference (χ^2 = 120.00,p<0.001). Another difference has been found between the gifted students (91%) in comparison to the normal (63%) regarding the preference to learn how to solve one problem in various ways **(**χ^2 = 22.10,p<0.001). Moreover, a distinct difference has been found between the students regarding the preference to discover independently explanations to misunderstandings, so that gifted students presented much more agreement (78%) than normal – non-gifted students (39%) (χ^2 =31.30,p< 0.001). Regarding the preference to

solving problems that are solved in various ways, a difference was not found between the groups.

In conclusion, the first research assumption was largely validated. The findings show that differences have been found between the gifted students and the non-gifted students in most preferences regarding the examined learning characteristics.

B. Examining the second research assumption

The second research assumption referred to the differences between gifted students and non-gifted students in all that is related to their perceptions regarding the interaction between them and their teachers and the teachers' attitude towards them. According to which: **The gifted students' perceptions regarding the teachers would differ from those of the non-gifted students.**

Table 5: Comparison between gifted and non-gifted in accordance to their preferences to the sort of the interaction between them and the teacher

I like	Answer	Segmentation (%)		χ^2
		Gifted (100)	Non-Gifted (100)	
To do a task with a partner of my choice	Agree Disagree	58% 42%	47% 53%	2.43
To do a task with a partner that learn at the same speed as mine	Agree Disagree	37% 63%	59% 41%	22.10***
To do a task with a partner that learns much more quickly than me	Agree Disagree	41% 56%	34% 66%	1.05
To sit in the corner away from everyone and do the tasks	Agree Disagree	83% 17%	39% 61%	31.30***

***p<0.01

Table 5 is indicating that there is a distinctive difference in the gifted students' preference (37%) to discover explanations to things they do not understand by the teacher's help in comparison to normal students (59%), thus, non-gifted students expressed a much higher preference to use the teacher's help in order to reveal explanations to misunderstandings (χ^2 =9.70,p<0.01). Another distinctive difference was found regarding the preference that the teacher will allow the students to explore and follow on an interesting idea, so that gifted students preferred this sort of teacher's attention better (83%) in comparison to non-gifted students (39%) (χ^2 =40.70,p<0.001). a difference was not found between the gifted students and the non-gifted students in their agreement regarding the teacher's effort to understand them, or regarding the wish to receive the teacher's encouragement to conceive a new idea. In conclusion, the second assumption was validated only partially. It seems that the more important part

to the students in their relationship with the teacher is the ability to explore and discover explanations.

C. Qualitative analysis of the research interviews

In addition to the questionnaire passed between 100 students, as mentioned, 10 students were randomly selected with whom in-depth interviews were held. In this section these interviews' findings will be presented, when half of the students were gifted and the other half were not gifted. The findings will be presented as divided to categories according to themes, and to gifted and non-gifted. The analysis is accompanied by examples of quotes from the interviews with the students.

Table 6: Qualitative analysis to the research's interviews

Category	Normal (non-gifted) students	Gifted Students	Integration
Personal details	Five gifted students from 8th grade, 2 girls and 3 boys	Five non-gifted students – normal from 8th grade, 3 girls and 2 boys	
Doing tasks in accordance to the teacher's demands	Normal students talked about doing what is required of them by the teacher. But in contrast to gifted students, normal students mentioned that in many cases they are not able to do what is required and need help "I am willing to do what is required but not always can."	Gifted students talked about a high capability and willingness to do the tasks required of them. Beyond that, regarding their self-capability, all of them noted that they can do more than what is required "I have high levels of abilities and I can do difficult tasks" "I am expecting to be subjected to high demands from the teacher"	Seems that there is a difference between gifted students and non-gifted regarding doing the tasks' requirements according to the teacher's instructions. Both in term of the ability to perform as well as the willingness to do so
Doing task with others	All of the gifted students expressed a preference to work alone "I rather working by myself because working with others holds me back" "I don't have the patient to wait for the other I rather to work alone"	Among the normal students the opinions are divided; 2 of them expressed a neutral stand regarding working with others, while the three remained expressed a preference to work with others "working with others can be interesting and even helpful"	It seems that there is a significant between the two groups regarding the willingness to do a task with others. The gifted students rather to study alone than with others, in contrast to normal students.

Disturbance when learning with others	What disturbed the gifted students in group work is when there are students who work slower and cannot keep up with them. Additionally, three of the gifted students expressed lack of content to explain things to others in the group because it detains the work. "working with other slows me down and can detain my work pace"	What disturbed to the normal students was in a case in which there is someone that is faster than them and working in a quicker pace and then they get frustrated, lose their thinking mode, and cannot work properly.	Regarding the reason that learning with others disturb or do not disturb to students, it was found that both groups notes the pace issue as something that interrupts to the group learning, but in two different aspects. So that gifted students mentioned the working pace in groups as holding them back and slows down their operation. While normal students noted that a too fast pace of one of the team members can be frustrating
Learning problem solving	When countering a problem, the gifted students talked about the preference to try to look for the solution by themselves by independent learning. One of the examples is solving by turning to the library to search for books in a particular subject the student countered while doing the problem, reading and finding a solution.	In contrast to the gifted, the normal students expressed a preference to receive help from the teacher or the parent, some of them have mentioned to get help from a friend "I always ask for help"	Regarding the preference to the way of dealing with a mathematic problem, the students from both groups report on different ways. Gifted students prefer to solve the problem alone while normal students prefer to ask for help and get it from the teacher, the parent or a friend.
A failed attempt in solving a problem	Gifted students noted that the few times in which they relinquish are when they are facing a difficult problem and fail to solve it. But a few of them mentioned that when they try to learn adult learning material they sometimes counter problems of a very high level, they try to solve and cope with it but without success.	One of the examples is when during a group activity all of the students were in an average level and only one of them was in a high level. The normal students in the low level expressed frustration and inability to cope with the gap between the levels which lead to a single solution and to a failure, from their part, in being a part of the group and solving the problem.	The students of both groups note events accompanied by a failure in solving problems. But the students' answers indicate that the gifted students expressed higher motivation to overcome difficulty before giving up.

Preparing for exams	All of the gifted students stressed that they go over the material only a little because they grasp everything in class and in the rest of the time the solve questions and practice the test's material, even in combination of questions of a higher level compatible to higher grades. They also noted that their learning is independent and they don't need help.	Normal students expressed a need for help while preparing for tests, from the teacher or a parent or sometimes from friends. In addition, they also noted that they have a need to go over the material a few times and only then practice exercises.	It seems that there is a difference between the systems for preparing for exams between the groups. In comparison to normal students, gifted students less tend to go over and over the material, and more tend to solve exercises. Moreover. Gifted students noted more willingness to learn independently without receiving or asking for help, in comparison to normal students.
Dealing with peculiar and disliked subjects	Gifted students expressed their curiosity to learn peculiar subjects however they did not prefer to learn disliked subjects, but rather to study new subjects that they are interested in more deeply.	Normal students expressed lack of favorability to learn subjects that they dislike and are peculiar to them and preferred to focus on subjects they are familiar with and to study them well.	Differently than normal students, gifted students expressed willingness to learn peculiar subjects. But similarly, to normal students gifted students expressed unwillingness to learn disliked subjects as well.
Evaluation as a reflection of knowledge	All of the gifted students talked about a lot of appreciation towards them but sometimes also a lack of appreciation when they to go too much further in a subject that the rest of the class is not interested in. moreover, sometimes there is a lack of appreciation when the teacher does not address to all of the knowledge they have but only to some of it.	Normal students felt appreciated most of the time by the teachers, and that the teachers do address their knowledge. though they also mentioned that sometimes the teachers do not address to the additional material the bring from home and they rather to hear only about things related to the material taught in class.	Both groups noted they receive a lot of appreciation from the teachers. However, both normal and gifted students express lack of content with teachers; evaluation of a new material the bring or their will to go deep in a certain subject.

The findings that arise from the interviews with the gifted and normal students indicate differences mostly in the ability and self-capability to do the requirements and the task

asked by the teacher and by his or her instructions; it seems that there is a difference in the self-capability regarding the execution as well as the willingness to do so. The gifted students expressed a lack of readiness to work cooperatively and peer learning, thus all of the gifted students showed a preference to work alone, student A said: "*I rather study by myself because working with others holds me back*", another student marked: "*I don't have the patient to weight for the other, I rather work alone*", in contrast, normal students were divided in their opinions and preferences, so some of them expressed willingness and readiness to work cooperatively and to cooperate with others, a normal student say: "*working with others can be interesting and even helpful*", and others expressed reluctance to do so. Regarding a disturbance when learning cooperatively, gifted students complain about the others' slow pace claiming that slowness holds them back; a gifted student claimed: "*working with others can slow me down and detain my working pace*". The opposite is true regarding the normal students who noted that the thing which usually disturbs them is a fast working pace of a member in the group, a normal student claims: "*It is hard for me to work with someone with a faster working pace than mine, I fail to follow, and sometimes lose my interest in learning and cooperating with the rest of the group*".

When countering a problem in school the gifted students talked about a preference to try and look for the solution by themselves via independent learning. One of the instances is solving by turning to the library to search for books about a certain subject in which the student has trouble with, reading them and finding a solution. In contrast to the gifted students, the non-gifted group of students preferred to get help from the teacher or a parent, some have noted on receiving help from a friend, a normal student marks: "*I ask for help all the time"* the gifted students mostly try to cope with problems and make several attempts in order to accomplish their task, but normal students feel frustration and inability to cope with the gap between the levels which eventually lead to a singular solution and to a failure, from their part, in being a part of the group as well as in solving the problem. Another difference stood up in relation to "*preparation to tests*", it seems that there is a difference between the groups when it comes to the methods of preparing to tests. In comparison to non-gifted students, gifted students do not tend to go over and over the material but rather to solve more exercises. In addition, gifted students noted more about willingness to learn independently and to not ask for help, as opposed to non-gifted students.

Regarding the "*coping with peculiar and disliked subjects*", gifted students demonstrated curiosity to learn peculiar subjects but did not preferred to learn disliked subjects, they rather to go really deep into new subjects they are interested in, a gifted student pointed out: "*I really fond of school challenges, I want to know many new things*". In contrast, non-gifted students expressed a lack of preference in learning unfamiliar or disliked subjects and preferred to focus on subjects familiar to them and to study them well, for instance student A claimed: "*I only deal with tasks given by the teacher, I do not favor to look for new information that is not relevant to the classes*".

Both of the students' groups note that they receive great appreciation from the teachers. But nonetheless, gifted students as well as non-gifted students express discontent with the teachers' evaluation of new materials they bring or regarding their willingness to go deep into a certain subject.

7. Conclusion of the findings

An integration between the quantitative and qualitative findings, indicates the unique needs and different preferences of the gifted students in comparison to normal (non-gifted) students. The gifted students expressed different preferences regarding; the school program, the type of problems and solutions, learning with or without others, a different treatment by the teacher. Some of their answers also indicate that the gifted students prefer singular learning, with a possibility to receive challenging problems and to solve it by themselves in their own ways. They also expressed a need to receive an evaluation from the teacher that is suitable to their needs – a unique and customized evaluation.

8. Discussion

The goal of this paper is to check for differences between the needs of the gifted students and the non-gifted students, to identify these differences and to understand them. This examination is of a significant theoretical contribution to the corpus of the field of giftedness, as well as practical, in relation to constructing school programs and educational interventions in all that is related to gifted students. Similar studies in the field of giftedness (David, 1997A, for instance) showed that gifted students have unique abilities, characteristics, and educational needs that are different from those of normal students that are not gifted. In this chapter of the discussion a reference to the findings presented in the previous chapter will be done, in accordance to the research's inquiries and assumptions that were presented in the previous chapters, and this will be done while attempting to explain them and to combine the former researches' findings and theories in the field in order to check the compatibility between this current research's findings and earlier findings. As presented in the literature review chapter, two assumptions were assumed in this research. The first is about the differences between gifted students and non-gifted students in relation to their needs in all that concerns the school programs and educational preferences. From the raised findings regarding the differences in the perception of needs among gifted students and non-gifted students, it may be concluded that the gifted group rather to learn with students who learn at a similar pace as them, an accelerated pace that is compatible to their ability to produce knowledge in great quantities and efficiently. The research explored the relations of the students detected as gifted toward cooperative learning and has found a connection

between the partner and the students' enthusiasm to learn cooperatively, meaning, gifted students enjoy solving certain problems cooperatively only if the partner is of their choice and learns at the pace as them.

The findings are compatible to Kanevsky's research (2011), which emphasized that gifted students require an option to work independently, acceleration, and learning with those who have similar capabilities and compatible learning pace. The findings emphasize the need to establish unique frameworks for gifted students (Worgen, 2006) that include students with the same learning level, the same need to learn certain contents, the same pace of progress, and to work cooperatively with other students of the same level.

This research's findings show that even when the gifted person is of a quick thought and understands new ideas and concepts effortlessly. These findings seem to show that the mentioned characteristics of the gifted student help him or her to deal with complex problems, which is manifested by gap between the findings of the gifted and those of the normal students regarding their preference to develop solutions to difficult and complex problems that are solved in different ways, hence, I've concluded that the learning preferences of the students detected as gifted are different from those of the students who were not detected as gifted and they were differentiated in ways that are compatible with the cognitive characteristics.

In accordance to these findings, David (1997A) discussed the uniqueness of a school program of gifted students, their will to solve complex problems. In addition, he discussed the need to provide these students with suitable conditions to their cognitive growth, to evoke interest by providing several problems in a level that is compatible to theirs and even higher, and to intrigue several problems related to different aspects of the student's life, challenge and self-realization. In this context, Kanevsky (2011) also discussed the need of the gifted students for a daily challenge in the field they are gifted in.

Thus, in my research I've concluded that gifted students have unique needs and they need to be provided steadily with a school program that is compatible to the gifted student's accelerated learning pace, content of the school program that is compatible to his cognitive level and to provide him with an opportunity to connect and learn with capable students in order to challenge their potential. These findings are compatible with previous researches' findings in the field that have shown that gifted have higher cognitive level than others in the same age group, they can be more persisted in doing tasks and are more capable to creativity than others (Renzulli, 1987).

Findings of researches addressing to gifted students' needs are compatible to this research as well, Kanevsky's for instance, which shows that gifted students have unique learning needs that include; opportunity to work independently, accelerated pace, constantly provided with challenging problems, and learning with students who share similar abilities as theirs. In relation to working pace, Winebrenner (2000) has shown

that gifted students are accustomed to finish the tasks quickly and are objected to working in a manner that slows them down. This finding is also found in this research when the gifted students reported the wish to work in rapid pace and without delays. Also in this context, several of researchers (Shviv, 1999, for instance) have reported the need of these school programs to gifted students will be distinguished than those of the non-gifted students. This uniqueness includes; providing challenging materials, a possibility to a critical, analytical, and creative thinking. Additionally, the need to provide a database and an option to work in a pace that is comfortable to them when exercising complex problems. Thus, this research's findings are compatible with the theories emphasized in the literature regarding the gifted students' needs and abilities in educational frameworks. These abilities and characteristics of the gifted can explain the differences in their preferences regarding educational contents, learning methods, and types of interaction.

The second research assumption referred to the students' perceptions of their interaction with their teachers, as well as the teachers' attitude towards them. In this context, it was assumed that there will be differences between the gifted students' perceptions and the non-gifted perceptions. The findings regarding the teacher-student interaction provide information that the gifted prefers a teacher who encourages positively and takes the student's thoughts and comments under consideration; these characteristics increase the student's interest in the studied content. This finding is also compatible with findings raised in other researches such as that of Makel, Putallaz ans Wai (2012), which tested the connection between the students-teacher interaction and the gifted students' approaches towards learning. In the same research, as it was found in this research as well, it seems that there is a connection between the teacher's behavior and the student's perception of the learning experience. Gifted students searched for teachers with a supportive and friendly approach that encourages positivity and enjoyment when learning a subject. Shviv (1999) also mentioned that the teacher's treatment influences the student's wish to learn a certain subject, so there is a special importance to the investigation of the student-teacher interaction as well as the students' perceptions of this interaction.

Beyond examining the research's assumptions, it is very important to note that the giftedness subject is a subject that was greatly dealt and discussed within the school system. Kanevsky (2011), for example, mentioned the importance of combining interests and preferences of the gifted students regarding the school program in order to produce maximum efficiency and progress in the field they are gifted in. in addition, combination of the students' preferences sends a message of the teacher's caring attention and his interest in the students and their needs. Hence, in order for the school program to be efficient in educating the gifted, a unique compatibility is required between the school program and the gifted students' needs who have the ability to learn new material in lesser time than others in their age group, as well as perceiving

and abstracting complex ideas and concepts easily, in comparison to their colleagues. They are passionately interested in specific subjects and continue further until they feel satisfied when achieving learning that is compatible to their abilities, and are capable to operate in various levels of simultaneous concentration so it is possible to follow activities in the classroom without focusing on them (Krofnik- Gottlieb and Idrgor, 2012).

Finally, from a personal stand point, this paper fascinated me, highly enriching by both gathering, writing and reading materials, and collecting data and orientating in the field with the students and hearing their stand points and experiences they decide to share. This paper has greatly contributed to my knowledge both theoretically and practically. Via this paper I could go deep into a subject that interesting me greatly and the knowledge I've acquired can assist me with my future practices. Moreover, I could practically experience the gifted students and their experiences as it is manifested in the field, and to learn through the paper the ways to deal with gifted students and their unique needs.

The research's findings inform about the unique needs of the gifted students, thus, it is highly recommended that teachers who educate gifted students will be exposed to the information about these students' unique requirements and preferences. Adjusting the school program of different subjects to the students' preferences is recommended as well. One of the main recommendations of this research is; inserting a change in the ways of evaluating the gifted students, it is important to combine alternative methods and evaluation tools that will assess the diversity of the gifted students' abilities and skills.

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