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Review Article

Teaching Mathematically Gifted Students in Israel: The State of the Art

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Abstract

This chapter summarizing the situation of teaching mathematics to the gifted elementary- and high school student in Israel. It surveys the various frames of learning: formal learning in the regular and in the gifted class, and the learning of math in the enrichment programs for the gifted – both in the Hebrew an in the Arab sectors. The second part of this chapter summarizes all the existing non-formal programs – acceleration as well as enrichment – for the mathematically gifted child and adolescent. It includes descriptions of these programs, their target audience, the subject learnt in them and the level of studying, the prerequisites – if any, and the contribution to the students in terms of contents as well as certificates or diplomas. The third part of the chapter deals with the contradiction between the well-developed are of learning high level mathematics for gifted students on one side and the comparatively low achievements of Israeli best students in the International examinations- TIMSS and PISA – on the other.

Keywords
mathematically gifted, TIMSS, PISA, educational strategies for gifted

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Introduction

Mathematical giftedness in Israel has been nurtured in a variety of forms, many institutions and through several programs for many decades. The first special Program for highly able math students started in Israel in 1970, two years before the beginning of the systematic, official identification for giftedness by the Ministry of education. Prof. Amnon Jakimovski, in his capacity as the head of the math department, Tel Aviv University, initiated the establishment of the gifted children program, now called after the late Prof. Beno Arbel who headed it from 1985 until his early death in 2013. Other higher education institutions opened various acceleration programs, e.g. Bar Ilan University and the Technion, Israel Institute of Technology, and enrichment programs, e.g. the Weizmann Institute – math and science by mail and science summer camps – all of them are still active.

However, neither the gifted classes, functioning 6-days a week, nor the 39 enrichment programs for the gifted in the Hebrew sector have managed to build special tracks for the learning of mathematics. As have been already noted: "[…] there are no Israeli scholars specializing in curriculum for gifted students" (Vidergor & Eilam, 2010, p. 33). Thus, in spite of the fact that many teachers are obliged to teach gifted children in many dozens of elementary- and high school classes it is the task of every individual teacher to answer the needs of her or his students: there is no special mathematics curriculum for the gifted learning in a gifted elementary- or high school.

This situated is compensated by the fact that mathematically gifted students, learning either in special or regular classes, can find out-of-school ways for math learning. This is done, in many cases, with the encouragement of many teachers who understand that it is beyond their ability to nurture these students' crave for math, and even when these math teachers are able to do that their first priority is helping the les-gifted while following the obligatory curriculum. One common temporary solution, applied in some gifted classes, is that a young child learns math with students who are one- or two years older, but this solution cannot hold too long as in most often after a short time the younger child needs some more acceleration. Thus the substantial step many good teachers teaching in gifted classes prefer is directing mathematically gifted children join an out-of-school program, even when this means lessons-skipping (usually in elementary schools) or taking a few school-days off (when having to prepare for university exams, for example).

The enrichment programs for the gifted in the Hebrew sector hardly offer any math learning, but even when they do – in these courses there are no homework, examinations or home-learning. For most mathematically gifted children these courses do not give an answer to their needs. In the Arab sector, however, in order to satisfy the parents' demand math learning is an integral part of the curriculum,

which serves as means to help the students strive towards high academic degrees in the best research universities and high-prestige professions.

Method

As this study is descriptive, namely, describes the situation at a certain point in a certain place, the method used has been screening the data about teaching the mathematically gifted in Israel from all available resources, and describing it. This has been done in two stages: all existing gifted programs have been screened, those initiate by the Israeli Ministry of Education and those operating at Israeli universities, as well as the programs for gifted and talented students founded by non-profit organizations initiated for the learning of mathematics, and the non-government mathematics-for-the gifted programs. After this stage has been completed the second was googling "gifted mathematics Israel", which gave 1,750,000 results, and googling "gifted mathematics Israel journal article" with 976,000 results. The first 100 results in each of these searches has been carefully checked in order to be sure that no program has been missed, and for assuring that the work of the authors of these items are known to this article's author. The author had first taught the course "mathematics for the gifted" in Israel about 30 years ago, had been published in this field for over 20 years, and served as the Founder and Head of the Israeli Society for Research on and Promotion of Giftedness and Excellence between 2005-2007, and speaks with over 100 families with gifted children every year from all parts of Israel, as a counselor for the gifted and their families, so she gets frequent updates of each program available for the gifted in Israel in general and about programs for the mathematically gifted in particular.

Mathematics for the gifted in elementary- and high school

Mathematically gifted students in the regular classroom

One of the characteristics of the regular Israeli classroom is the focus on the low-level, "weak" students (e.g. Arcavi, & Mandel-Levy, 2014; Benny & Blonder, 2016). According to Aharoni (2002), "A recurring complaint from secondary school teachers is that students arrive from elementary school with very scarce knowledge of fractions". It is not difficult to understand that when one third of math teachers fail in the 4 elementary subjects: numbers and integrals, fractions, percentages, and elementary geometry, and when the average grade the teachers taking this exam after an in-service training course was but 73.8 [of 100, the equivalent of the American "C"] (Volmer, 2011); it is beyond the ability of these teachers to support their mathematically gifted students.

In high school the situation in not any better. Arlozorov (2011) has summarized the opinion of 15 mathematics professors, including the head of mathematics departments of all 7 Israeli universities, regarding the level of high

school teachers: according to these professors, "the professional knowledge of the math teachers is shocking", and "academic staff members of all universities complain that students starting their higher education in math, science and engineering are less prepared than in the past. This goes along with the warning tendency of increasing shortage of suitable mathematics teachers". These professors claim that while formally teachers who prepare students for the matriculation examinations must have an MA/MSc degree in the subject matter they teach, only 22% of the math teachers under the age of 45 have graduated from any math department, namely, they do not have even elementary mathematics education.

Needless to elaborate that under such circumstances, a mathematically gifted student learning in a regular classroom hardly has any prospects of being nurtured either in elementary school or in high school.

Mathematically gifted students in the gifted classroom

While differences in the education and knowledge of math teachers teaching in regular classes does not differ substantially between elementary- and high school, mathematically gifted students learning in special classes are much more nurtured, in general, even if the math education of their teachers is not always satisfying. The main reasons for this situation are:

- The general academic level of the teachers of the gifted. Teaching in a gifted class in Israel does not require a higher degree than teaching in a regular class, and the only formal requirement is completing a gifted 2- or 3-year in-service training course, which has no actual influence on the professional level of the teacher (Vidergor, 2010). However, even in countries where there is no formal gifted education the section of teachers is very strict so that only a small percent of the potential candidates are accepted to pre-service programs for teaching, and thus "natural selection" directs many high ability, highly professional young people to be teachers in mixed classes that suit gifted students as well (Tirri & Kuusisto, 2013), as well as teachers with advanced academic degrees (ibid). One such math teacher in an entire school can substantially change the motivation, the enjoyment and thus the advancement of math among the mathematically gifted in the whole school.
- The understanding of the teachers of the gifted that their students have cognitive needs that need to be fulfilled. Attitude towards the gifted has proven to be a most important component of success in teaching the gifted. It was first studied by Peachman (1942), intensively studied by Françoys Gagné, one of the leading researchers of gifted education for over a decade (e.g. Gagné 1983; Gagné & Nadeau, 1985; Gagné, & Bégin, 1994a, b), well into the 20th century (e.g. Lassig, 2009; McCoach, & Siegle, 2007; Tirri et al., 2002)

and in the current decade (e.g. Öztürk, & Fıçıcı, 2014, Perković Krijan, & Borić, 2015). Prospects are good that a teacher of the gifted will be more attentive to the cognitive needs of her or his students. When more attentive he or she can either match the teaching pace and level to the mathematically gifted or help them find alternative ways to do that.

- The comparative flexibility in the gifted class that allows grade-skipping in one or more subjects. Math teachers of the gifted – especially the more experienced – are well aware of the fact that the differences among the achievement and understanding level among their students are huge. Thus in many cases they recommend – at least allow the more advanced students to learn in a higher level grade. Subject grade-skipping is a well-known practice in gifted education in general and for the mathematically gifted in particular. However, this practice serves, in most cases, as a transitory one because more often sooner than later the highly gifted need further advancement that cannot be provided in school.
- The encouragement students get from some school principals familiar with the need of their mathematically gifted students. This encouragement is expressed in a variety of ways, for example: by allowing the students skip classes and sometimes even whole school-days in order to participate in one of the university math programs for young students; the willingness of principals to operate the weekly classes of the Open University inside their schools in order to facilitate transportation problems of their gifted students, the honor mathematically gifted students are awarded when winning medals or prizes in national and international competitions, contests, and Olympiads.

Mathematical giftedness in the enrichment programs for the gifted

In the school year 2016/7 no less than 56 enrichment centers for the gifted have been operating in Israel. The learning of mathematics in the regular and the gifted classroom is obligatory as one of the "core subjects" (2016). In spite of the fact that according to the Outline of the curriculum for gifted students learning in special centers (2009), which stresses the learning of mathematics as one of the obligatory, core subjects in most centers for gifted and excellent students this recommendation is not applied; mathematics is not taught in most morning- or afternoon enrichment programs in the Hebrew sector.

Mathematics learning in the enrichment programs in the Hebrew Sector

Of the 39 enrichment centers in the Hebrew sector, only 19 have supplied information about the contents of the programs they offer (List of the enrichment centers, 2016). Of these 19 programs aimed both for gifted and excellent students, only a few offer some mathematics courses. In the few programs that offer math

learning all courses are one-semester 75-90 minute long and many are elective. All other programs do not supply information about math courses.

One of all these programs, located at the "gifted school", Center of Excellence (2016), Dimona, is exceptional. It offers math courses to ALL kindergarten grade 12 students wishing to learn mathematics by better teachers, in a positive environment, without having to "pass" any entrance examinations. In addition, there is a substantial fee reduction to students of math [and English], which encourage many parents to have their children participate.

Gifted learners of mathematics in the Arab sector

Arabs consist of about 20% of the Israeli population (CBS, 2016, table 2.2). A vast majority of Arab students – at all grade levels – learn in a separate educational system; this includes compulsory school and enrichment for the gifted programs. Some main differences in education for the gifted exist between the Hebrew and the Arab systems, especially in the learning of mathematics in particular.

Quite a common means for Arab parents – Muslim as well as Christian – to encourage the learning of mathematics among their high ability children is send them to private, Christian schools. These schools have a long history of excellence, and their graduates have had, for many decades, the highest achievement in the Israeli matriculation examination (David, 2014a, b). In spite of the fact that Christians consist less than 2% of the Israeli population, and only about 10% of the Arabs in Israel, their rate in the highest-level professions, positions and appointments, e.g. judges in general and supreme court judges in particular, university professors, etc. – is substantial.

The average achievements of Israeli male students are masked by the low achievements of female students in the Hebrew sector. For example: while in 2015 the mean score of 90th percentile boys in mathematics has been 614, about the OECD average, that of 90th percentile girls have only been 589, much lower than the OECD average (ibid, table 1.5.8a). This is not the case in the Arab sector. Girls achieve in most cases higher than boys, and they participate in high level learning of math – as well as of science – more than boys (see, for example, David, 2014a).

While there are still no special classes for the gifted in Arab elementary schools,[2] there are no less than 17 enrichment centers in the Arab sector (List of the enrichment centers, 2016). One of the main solutions of Arab parents to the problem of low achievements in the Arab sector in Israel (e.g. David, 2008b) is demanding that mathematics – as well as English, Hebrew and in some cases also

[2] On May 3, 2015, the Israeli Ministry of education has announced the opening the first class for gifted Arab children in Haifa (The first class for the gifted in the [Arab] sector, 2015). This class did not open either in the 2015/6 or in the 2016/7 schoolyear (Special classes in elementary schools, 2016).

Arabic – is taught in these centers (David, 2017). While in the Hebrew sector students who participate in a gifted enrichment program hardly learn there math, and in many cases misses math classes in their regular classroom, Arab student attend the enrichment centers in most cases during the weekend, so they do not miss their regular classes, and also get additional high level math classes in order to help them achieve highly (David, 2014a).

One of the results of learning high level mathematics in ALL Arab enrichment programs –13 of which are located in the northern part of Israel and in Haifa (List of the enrichment centers, 2016) – is the high percentage of Arabs learning in the Technion, Israel Institute of Technology and one the world famous institutes of its kind. The Technion is the only higher institution in Israel – except for Arab teachers' colleges – with 20% of Arab first degree students. Furthermore: 45% of the Technion students are females – a much higher percent than in the Hebrew sector and the highest level among all similar institutions in the Middle East (Lavie, 2016). This can also be due to the fact that most Christian schools in Israel – where at least half of the population is Muslim – is located in Haifa and Nazareth (David, 2014a). These excellent schools whose students do not take the Israeli ministry of education giftedness tests and do not participate in the gifted programs focus on the learning of mathematics, science and languages. The high level of math learning, starting in grade 1 and sometimes even in kindergarten, is the basis for the high achievement level of Christian Arabs in Israel, and of Muslim Arabs who learn in Christian, private schools.

Mathematically Gifted Students: Out of School Programs

While the learning of mathematics in the Israeli regular or the gifted classroom does not give a satisfying answer for the needs of the mathematically gifted students, there are many out of schools programs that do. Several of them are considered enrichment and others- acceleration programs. The two most demanding acceleration programs for mathematically gifted students, whose graduates start their academic track while still in school are The Program for Youth Talented in Mathematics (2016) and The Beno Arbel Program for Outstanding Mathematics Students (2016).

The Program for Youth Talented in Mathematics (2016), located at the Bar Ilan University was initiated 1982; In the 2016/7 school year it included about 6000 grade 6-10 students from all over Israel. The program offers three tracks: Math enrichment; math acceleration, where the students take the challenging matriculation math exam in grade 10 rather than at the end of grade 12; and academic education for 16-year olds. Many students, especially the more gifted, start the program in grade 5; others skip one year of the enrichment track and start the acceleration one in grade 7; in 2015 at least two grade 6 students started it. This

means that if they were successful they would be able to take the highest level math matriculation exam at eh end of grade 8, at the age of 14: four years before their peers.[3]

Math enrichment for grade 6-7 students is offered in 30 centers; the second stage – math acceleration – is taught in most of these centers and the last stage, the academic track, takes place at the Bar Ilan University, Ramat Gan. The students are taught in small classes, fast pace in accordance with the students' ability and a unique learning and social experience. The three aims of the programs are: Nurturing mathematical excellence and math thinking abilities while empowering talented students; Enrichment of math knowledge in a variety of aspects beyond the learnt material in formal education; Advancing talented students towards the spearhead of the Israeli academia.

***The Beno Arbel Program for Outstanding Mathematics Students* (2016)**

Formerly the Mathematics Acceleration Program, Tel Aviv University (David, 2008a), the program is aimed for mathematically precocious 13-15- year-old students in Tel Aviv and its adjoining cities. During one school year, eligible students are exposed to subjects such as set theory or basic calculus, and then start their mathematical education as first-year university students while still in high-school. Many of these students receive their Bachelor degree – some even their Master's – before their 19th birthday. This program is recognized as the best one in Israel. Its graduates prove outstanding in all national and international competitions and Olympiads.[4]

There are also various programs both in Hebrew and Arabic for youth interested in mathematics.

***The Students' Unit: Davidson Institute of Science Education* (2016)**

The Davidson Institute which is a part of Weizmann Institute of Science offers math and science by mail courses and science summer camps. One can join "the math and/science online activity" at any time, and work according to their own personal progress. This program is offered in three grade-levels: for grade 3-4-, 5-6, and 7-9-students. The subjects vary from one year to the next; Weizmann Institute scientists are involved in preparing the digital books with puzzles, experiments and magic tricks, videos and weekly challenges in Hebrew, English or Arabic. Each student can join this program as an individual, as a part of a small group of at least 5 students; a school with more than 60 participants is eligible to free in-service training from the Davidson Institute's math team. ALL materials, including the "letter to the parents", as well as the instruction, are available in Hebrew and Arabic. The program is defined as "approved by the ministry of education". "The

[3] As a counselor of gifted children I have been exposed to this data but I cannot reveal any further details about these two students.

[4] On the participation and achievement of Israeli students in international math Olympiads see David (2017).

Weizmann science summer camps" offer "a month of research, science and fun for high school graduates from all over the world". Every summer about 80 highly talented, recent high-school graduates from around the world participate in this month-long English program which involves intensive lab work, lectures, tours and social activities. Projects are offered in a variety of fields including mathematical and computer sciences.

***The Joseph Meyerhoff Youth Center for Advanced Studies* (YCAS) (2016)** at the Hebrew University, has been active for the past 30 years, specializing in academic education for youth of all sectors in the Israeli society. Activities at YCAS include extracurricular courses that take place after school, morning seminars for organized classes and school groups and also holiday and summer camps. Collaborating with social organizations, private funds and commercial companies, YCAS also produces specific science-oriented projects and events for children, youth and families. YCAS staff includes Hebrew University students, both undergraduate and graduate, who incorporate the knowledge and experience they bring from their studies and research into their instruction.

***Noam Center: Mathematics for Talented Youth at the Technion* (2016)**
The Noam Center (2016) is in charge of four different mathematics programs aimed primarily for high school students. "From a High School to the Technion" enables grade 10-12 students excelling in math to take courses at the Technion towards a BSc degree; The two-week Math Summer Camp (2016) combines a study of number theory and the RSA encryption system with various fun activities; the Grossman Math Olympiad for high school students and soldiers doing a compulsory military service, and the The Math Riddles course in the Technion Math Department (2016) dealing with mathematical problems and puzzles coming from a variety of math areas.

Odyssey: Future scientists and inventors of Israel (2016)
The Dov Lautman Unit for Science Oriented Youth (2016) was the first higher education institution that adopted this program in 2009; today its partners are also the Hebrew University of Jerusalem, the Technion, the Ben Gurion University of the Negev and the Tel Chai academic college, as well as 8 additional institutions.

This program develops and nurtures grade 9-12 highly motivated students with extraordinary abilities and scientific aptitude in three tracks: physics, biomed and cyber (Future scientists and inventors, 2015). In both the cyber an the physics tracks many mathematically gifted students materialize their abilities in mathematics; the cyber track includes courses such as discrete mathematics and linear algebra, in addition to extended introduction to computers sciences, programming 1, several programming languages, communication nets, data

structures, etc. The physics track includes also mathematics courses as well as courses such as special relativity, considered an applied math course.

High level math program operated by non-profit organizations in certain schools

The MOFET Association (2016). The Amuta Jerusalem was founded in 1992, by parents of elementary-school children belonging to the massive immigration wave of about 700,000 Jews from the Ex-USSR countries to Israel. Its aim was to challenge high level children-repatriates adjust to the Israeli system of education. In its current form The MOFET Association (ibid) includes many Israeli-born students; it has spread its unique math and science classes to about 20,000 grade 7-12 students in ~120 educational institutions belonging to all Israeli sectors. It also offers physics, computer science and English high level classes and personal empowerment for the students, their parents, and their teachers. In addition to its whole-year extra-curricular math and science activities the MOFET Association is in charge of a yearly Olympiads in mathematics and physics for high school students. It also offers training for math teachers which include access to the relevant materials in the math department web, and a monthly "Math riddle" – a challenging, multi-stage problem.

The MOFET program has been recognized by the department of education as an acceleration school-program, and as such outstanding participating students are allowed to take the highest 5-point level matriculation math examinations I the middle of the 11th grade instead of at the end of grade 12. Mathematics teachers of the MOFET program take part in a summer continuing education program which includes advanced math problems and preparing students to the math Olympiad, and subjects related to didactics of mathematics.

Summary and an open question: **What has gone wrong?**

As there are so many good programs for mathematically gifted and talented students in Israel, it should have been expected that in spite of the continuous deteriorating achievements of Israeli students in the international studies (e.g. David, 2014b, 2015), the rate of top students, especially those defined as gifted or talented but also all those participating every year in the various mathematics programs will be high. Unfortunately this is not the case.

When we look at the rate of "level 6" students, who have achieved higher than 669.3 points at the PISA 2015 examination, Israel is behind the OECD average (OECD, 2016, table 1.5.1a). This means that when the PISA sample included the relative rate of students considered "gifted" or "excellent" by the Israeli ministry of education 5% of the population who was entitled to gifted education, only 1.9% reached the "level 6", top achievement math level.

This result has a special importance regarding gifted education in Israel in general and mathematical giftedness in particular. Mathematical giftedness is nurtured in Israel in a variety of ways, resulting in highly achieving students at all levels, students who have good prospects to materialize Israel's scientific and technological future advancement. However, the potential number of these excellent student seems to be much higher than the actual one, as is demonstrated in ALL latest international examinations. Thus the main question still remains unanswered: how come that in spite of the comprehensive gifted education system in Israel, it fails to "produce" enough high level students, while in most other OECD countries, without any education for the gifted system or with a much smaller system it succeeds.

References

Aharoni, R. (2002). The Proposed Math Curriculum For Elementary Schools In Israel: A Critical Summary. Retrieved from http://www2.math.technion.ac.il/~ra/ra-curr2000.html

Arcavi, A. & Mandel-Levy, N. (Eds.) (2014). Education for All and for Each and Every One in the Israeli Education System. Status report and recommendations. Report of the Committee on An Education System for All and for Each and Every One. Translated from Hebrew by Judy Eichenholz. The initiative for applied educational research. Jerusalem: The Israel Academy for Sciences and Humanities. Retrieved from: http://education.academy.ac.il/Admin/Data/Publications/education-for-all-eng.pdf

Arlozorov, M. (31/10/2011). The situation of high school math teacher is shocking (in Hebrew). Retrieved from: http://www.themarker.com/career/1.1535488

The Beno Arbel Program for Outstanding Mathematics Students (2016) (in Hebrew). Retrieved from https://exact-sciences.tau.ac.il/beno-arbel-home

Benny, N., & Blonder, R. (2016). Factors That Promote/Inhibit Teaching Gifted Students in a Regular Class: Results from a Professional Development Program for Chemistry Teachers. Article ID 2742905. Education Research International. Retrieved from: http://dx.doi.org/10.1155/2016/2742905

CBS, Central bureau of Statistics, 2016. Retrieved from: http://www.cbs.gov.il/reader/?MIval=shnaton%2Fshnatonh_new.htm&CYear=2016&Vol=67&CSubject=2

The "core subjects" (2016). Retrieved from the Israeli Ministry of Education web: http://edu.gov.il/owlHeb/Tichon/MiktuotTchumiLimud/core-subjects/Pages/core-subjects.aspx (in Hebrew).

David, H. (2008a). Mathematical Giftedness: The Mathematics Acceleration Program at the Tel Aviv University. *Gifted Education Press*, 22(3), 4-9.

David, H. (2008b). Educational gaps between Jews and Arabs in Israel. *Al-Nibras*, *Articles in Education, Science & Society, 4*, 35-53.

David, H. (2014a). *The gifted Arab child in Israel*. Saarbruecken, Germany: Lambert Academic Publishing.

David, H. (2014b). Israel's Achievements in Mathematics in the Last International Examinations: Part I: The TIMSS 2011. *Journal of the Education of the Young Scientist and Giftedness, 2*(1), 11-17.

David, H. (2015). The PISA Results in mathematics and science: A comparison between Israel and Turkey. *Journal for the Education of the Young Scientist and Giftedness, 3*(1), 22-28.

David, H. (2017). Gifted Education in the Middle East. In: S. Pfeiffer, E. Shaunessy-Dedrick & M. Foley Nicpon (Eds.), *APA Handbook of Giftedness and Talent*. Washington, DC: APA Books

Davidson Institute of Science Education (2016) (in Hebrew). Retrieved from http://www.weizmann.ac.il/pages/telem-students-unit

The first class for the gifted in the [Arab] sector (2015). Retrieved from http://www.newshaifakrayot.net/2015/05/03

Future scientists and inventors (2016). Retrieved from: https://noar.tau.ac.il/future-scientists

Gagné, F. (1983). Perceptions of programs for gifted children: Agreement on principles, but disagreement over modalities. *British Columbia Journal of Special Education, 7*, 113-127.

Gagné, F., & Bégin, J. (1994a). Predictors of a general attitude toward gifted education. Journal for the Education of the Gifted, 18, 74-86.

Gagné, F., & Bégin. J. (1994b). Predictors of attitude toward giftedness: A review of the literature and a blueprint for future research. Journal for the Education of the Gifted, 17, 161-179.

Gagne, F., & Nadeau, L. (1985). Dimensions of attitudes towards giftedness. In A. H. Roldan (Ed.), Gifted and talented children, youth, and adults: Their social perspective and culture (pp. 148-170). Monroe, NJ: Trillium.

The gifted school, Center of Excellence, Dimona (2016). Retrieved from: http://di.sisma.org.il/mehonanim/Pages/home.aspx

Grossman Math Olympiad (2016). Retrieved from: http://noam-math.net.technion.ac.il/en/grossman-math-olympiad

The Joseph Meyerhoff Youth Center for Advanced Studies (YCAS) in the Hebrew University (2016). Retrieved from: http://nsmada.huji.ac.il/About_Us

Lassig, C.J. (2009). Teachers' attitudes towards the gifted: The importance of professional development and school culture. *Australasian Journal of Gifted Education*, *18*(2), 32-42.

Lavie, P. (18.04.16). Minorities at the Technion: The reality version. Retrieved from http://www.ynet.co.il/articles/0,7340,L-4793206,00.html

List of the enrichment centers (11/11/2016). Retrieved from: http://cms.education.gov.il/EducationCMS/Units/Gifted/amudim/ReshimatMerkazeMechunanim.htm

Math Riddles Course (2016). Retrieved from: http://noam-math.net.technion.ac.il/en/math-riddles-course

Math Summer Camp (2016). http://noam-math.net.technion.ac.il/en/math-summer-camp

McCoach, D.B., & Siegle, D. (2007). What Predicts Teachers' Attitudes Toward the Gifted? *Gifted Child Quarterly, 51*(3), 246-254.

The MOFET Association (2016). Retrieved from http://www.reshetmofet.org/iw

Noam Center: Mathematics for talented Youth at the Technion (2016). Retrieved from http://www.math.technion.ac.il/Noam/noam-en1.html

OECD (2016), *PISA 2015 Results (Volume I): Excellence and Equity in Education,* PISA, OECD Publishing, Paris. Retrieved from: http://dx.doi.org/10.1787/9789264266490-en

Outline of the curriculum for gifted students learning in special centers (2009). Recommendations of the steering committee, 2009. The state of Israel, The Ministry of education, The department of gifted and excellent students. Retrieved from: http://gifted.cet.ac.il/ShowItem.aspx?ItemID=c0ffbd36-3220-4913-a613-61a7d778137e&lang=HEB

Öztürk, M.A., & Fıçıcı,A. (2014). The Development of the Educators' Attitudes toward Gifted Education Scale. *International Online Journal of Educational Sciences, 6* (2), 349-360.

Retrieved on 10 February 2019 from: https://pdfs.semanticscholar.org/1fd6/8fdd15130278a1fc75278f7640f3a0e040b5.pdf

Peachman, M. C. (1942). Attitudes: their significance in education for the gifted. *Journal of Educational Psychology, 33*(3), 183-198.

Perković Krijan, I., & Borić, E. (2015). Teachers' Attitudes towards Gifted Students and Differences in Attitudes Regarding the Years of Teaching. *Croatian Journal of Education, 17*(1), 165-178.

The Program for Youth Talented in Mathematics (2016) (in Hebrew). Retrieved from https://www.yuni.co.il

Special classes in elementary schools (2016) (in Hebrew). Retrieved from http://cms.education.gov.il/EducationCMS/Units/Gifted/amudim/ReshimatKitotIchudiyotYsodi.htm

Technion Youth Activities Unit (2016). http://www.noar.technion.ac.il

Tirri, K., & Kuusisto, E. (2013). How Finland Serves Gifted and Talented Pupils? Journal for the Education of the Gifted, 36(1), 84-96.

Tirri, K.A., Tallent-Runnels, M.K., Adams, A.M., Yuen, M., & Lau, P.S.Y. (2002). Cross-Cultural Predictors of Teachers' Attitudes toward Gifted Education: Finland, Hong Kong, and the United States. *Journal for the Education of the Gifted, 26*(2), 112-131.

Vidergor, H.E. (2010). Teachers of the gifted in Israel: Cognitive aspects of the training program. Ph.D. thesis, University of Haifa, Haifa, Israel (Hebrew).

Vidergor, H.E., & Eilam, B. (2010). Curriculum transformation: The Israeli teacher certification in gifted education. *Gifted and Talented International, 25*(2), 29-51.

Volmer, T. (21/6/2011). One third of math teachers failed in math. Retrieved from: http://www.ynet.co.il/articles/0,7340,L-4084982,00.html