



"THE NEW STUDY PROGRAM IN THE SUBJECT OF SCIENCES – AS LEADING A CHANGE IN ACHIEVEMENTS AMONGST BOYS AND GIRLS IN JUNIOR HIGH SCHOOL, ESPECIALLY SCIENTIFIC TECHNOLOGICAL CLASS STUDENTS THE RESERVE OF ISRAEL."

Participation in conferences

Published by orly nissel, October 2014

As an educator who manages the science and arts department, and a science teacher for 30 years, as a science subject coordinator, as leading teachers and pupils in teaching of science, as coordinator and leading the reserve classes in three age-groups in Teddy Kolek Junior-High school in Jerusalem, as class teacher of the scientific technological reserve and science instructor in Junior High school in the Education Administration in Jerusalem, activist, partner and affecting in leading the positive change trends in increasing the choosing of scientific subjects in Junior-High and High schools amongst boys and with a gender emphasis regarding girls, in light of my extensive experience in the field, I decided to study and examine the effect of this move in the educational system while a gender emphasis.

INTRODUCTION

“Very few girls apply presently, to technological study courses, and not just in Israel, it is a huge human resource. I believe that a country that finds a way to introduce more girls to the high-tech industry would be the first one to have an economic breakthrough and would rapidly advance technological education within it. In a visit to a High-school where electronics department was opened, I asked one of the girls what field she would want to work in, in the future. Her answer was, “electronics engineer”. You don’t see that a lot. Those girls can be definitely educated for a technological future. The idea is to arouse curiosity in them from an early age, so that they find the magic and beauty in technological subjects” [5].

In 2009, a new study program was written in science [7]. The reasons for this are: appointment of a new Minister of Education, Gideon Saar, who has expressed a concern due to the “lost decade”, a technological development in the 21st century and creating a disconnection between pedagogy and technology, the deterioration of scores of Israeli pupils to last places in relation to the world and a reduction in the number of girls who apply to practicing technological fields. One of its targets is reinforcing the study of science for all, with a gender emphasis while reinforcing girls. For this purpose, a structured program was developed in the

Ministry of Education with targets and purposes, which impacts and outputs were examined in current study.

It is important for Israel to reinforce the teaching of science in order to qualify citizens, men and women, who are active and who contribute to the functioning of society in this field. High-tech industries in Israel are a growth locomotive of the economy and they lean first and foremost on quality personnel, men and women, in fields of science and technology. Improvement of quality of the human resource integrated in these sectors and its increase, serve both national and private interests. The state enjoys reinforcement of its economic strength and an individual who integrates in these sectors can expect a high income and the country enjoys the strengthening of its economic power. Israel might lose its relative advantage over time without a focused and planned handling in the early stages of education. For example, the rate of excelling Israeli pupils, girls and boys, in 8th grade, is at about 4% in math and 5% in science (2007). This is a very low rate in comparison to the leading countries from Eastern Asia with over 30% in math and around 20% in science [8].

These facts constituted the background for making a significant change in the rate of excelling pupils in fields of science and technology in Israel. In 2009, the Minister of Education initiated a strategic move for strengthening the studies of science and technology amongst pupils with an emphasis in strengthening girls. Additionally, a program was been formulated for enhancing science-technology excellence “the scientific-technological reserve” and in 2010 the designated classes were opened [1]. A “quality scientific-technological matriculation diploma” was defined and a model was designed for increasing the rate of excelling pupils, boys and girls, who graduate their High-school studies with such a matriculation diploma. The program was based on the premise that there is a greater potential of pupils, boys and girls, who excel in fields of science and technology than the rate of pupils who presently achieve a quality scientific-technological matriculation diploma. Without a guiding hand on part of the educational system, the potential of these pupils will not be realized. The educational system must improve the ability of isolation, guiding and retention of pupils with high potential while having a gender emphasis. The defined target as part of the reserve program is to triple the rate of pupils, which means to reach 20% excelling pupils, boys and girls, within nine years [8].

In the second international study (1980-1989), differences were found in Israel between the achievements of boys and girls in 8th grade, all in favor of boys. The conclusion was that in average, girls are less interested in science and particularly in physics. Girls have positive attitudes towards science but less understanding in the essence of science and willingness to specialize in these subjects. In last decades, there have been incessant discussions on the importance of increasing the inclusion of girls in natural sciences and creation of conditions and ways of learning that would draw in more girls to the studies and to their practice of science [11].

In the new study program in science, an integration was done in three fields: philosophy provides the instruction, psychology provides the basic principles of learning and technology provides the means for realization [9]. Following the change in the program and improvement of achievements, the number of parents and pupils, boys and girls, who arrive to Junior-High

school and are interested in the course of study in the scientific and technological reserve, which allows for a matriculation to those excelling in these fields, has increased. The program encompasses 7th to 12th grades. Presently, 229 6-year schools are participating with more than 10,000 pupils, boys and girls, from Junior-High schools – Jews, Muslims and Christians (2013) [2, 3]. Investment in the program is quite high [12]. Starting from 7th grade, study hours were added and study programs were implemented in physics, computer science and math [10, p. 6].

Participation in conferences -

The conference will be held in the framework of the project TWIST -Towards Women in Science & Technology, the European Union, to encourage girls to choose from in the sciences and technology, in which a partner Bloomfield Science Museum Jerusalem along with other science museums in Europe and European organizations more. Goal of the project to increase among teenagers, their parents and teachers awareness of the importance of proper representation of women in science and technology.

The purpose of current study was an examination of the correlation between the new science study program and attitudes and achievements in science amongst pupils in the technological science reserve class in 7th, 8th and 9th grade in Junior-High school, while relating to gender and understanding the factors that influence study and up to the choosing of science subjects as enhanced subjects in High school.

The research is based on a scientific technological reserve class. The class is comprised of excellent pupils (excelling and gifted together) and integrated boys and girls. . There are classes that the gender gap is in favor of girls but in most classes there is a numeral gender gap in favor of boys. In current study, a significance has been found in high incidence of 95-100% amongst pupils for the existence of classes of this type, that include boys and girls together. The hypothesis of the researcher was that there would be preference amongst girls for studying in classes of a female model in which there is a representation of girls only. The hypothesis was based on the article of Hanson (1996); the reasons for this gender preference are: good functioning of girls in this situation, girls succeed better when there is an encouraging atmosphere in class, there is a constructive feedback, all express their opinion when the teacher evaluates the scientific ability of girls as that of boys. There is a low incidence for a class of a female model and therefore, the hypothesis in current study has been refuted. Girls prefer to study in an integrated class with boys and to gain full support on the part of the teacher as if there are only girls in the class without boys. Due to the desire of girls to study in integrated classes and due to a study gender difficulty amongst girls with boys such as understanding of

contents and processes in a profound manner, the recommendation is to establish a nuclear home class and from it the girls would go to lessons in subjects under discussion the likes of physics. At the end of the lessons, the girls would return to the home class and thus would continue to study in the integrated class according to their wishes, with boys.

According to current study, for girls it important that a teachers has characteristics of good communication skills and of interpersonal relation while for boys it is important that a teacher emphasizes commitment to teaching and promoting motivation (4,5). The research findings have revealed a strong correlation between the activity of a teacher according to gender needs and between choosing of study subjects as enhanced in High school with an emphasis of the subject of physics. The clearer is a teacher in his speech, the more he uses several strategies and tactics adjusted in terms of gender so that learning is significant and the teacher is considered an excelling and qualified for teaching in the designated class. An excelling teacher enhances motivation amongst learners. In current study, it has been revealed that not every teacher who teaches in a designated class is considered to be excelling (4,5).

Conference Invitation-Science and Technology for boys only ?!

Teachers Symposium Bloomfield Science Museum Jerusalem topic:

Gender equality in the classroom that encourages girls and boys in science and technology
Are girls are emotional and irrational and therefore not appropriate to do science?

Is science and technology subjects suitable only for boys?

Scores in Metzav science and technology in the 5th classroom, there is a small gap in favor of girls, but in the 8th grade there was no difference at all between the genders. Scientific trends in post-primary schools, the percentage of outstanding girls from all girls are relatively high percentage of children who excel. Although this number is much smaller than the number of boys enrolled in these trends. The question why only a few girls choose to study physics, computer science and technological subjects?

In our view - and many studies support this - the answer to these questions is clear: Girls can also, of course, appropriate, but there is need to change the social consciousness that allows them to maximize their capabilities.

Educational staff at the school - teachers / consultants / managers / influential in the future careers of students and professional students so it is important to raise the awareness of all staff teaching the issue of gender equality in school.

The conference will be held at the Science Museum in Jerusalem, 4/7/2012, at 09: 30-14: 30.

The program includes:

- "coffee scientist" - brief meetings over coffee and cake, with scientists and researchers from academia.
- Talk with TWISTY - witty virtual character confronts visitors with their prejudices on issues of women and science.
- Explore science with reference to the groundbreaking discoveries of women.
- Panel discussion on "Gender Equality in the classroom that encourages girls and boys in science and technology"
- Performance and thought-provoking satire on gender and science incubator theater performing team "slaughtered cow", "How do scientists need for coffee?"

To register: <http://www.mada.org.il/twist/harshama>.

In the conference, a fact was addressed that teachers treat differently boys and girls studying in a class. This stems from overt and overt stereotypes that characterize our society. For this purpose, it is proposed to video record a lesson and thus it will be made possible to examine the way of teaching of a teacher and his treating of boys and girls equally. New recommendations were given in the conference, for improvement of rate of equality in class and increasing of awareness with a purpose of encouraging boys and girls towards fields of science and technology. Examples for ideas from a lecture by Dr. Ronit Ashkenazi [6]: 1) Encouraging pupils for study enhancement in mathematics and science. 2) Encouraging of girls for using technological equipment in practical activities and experiences. They often prefer passive learning. 3) Encouraging of girls for scientific activities outside the study framework. Girls tend to take part in extracurricular activities not related to science. 4) To integrate in teaching meetings with female scientists who practice fields "considered to be male". The girls will identify with successful women. This will consolidate their self-confidence and thus they will realize that they are not alone in a "male" environment. 5) Reducing the dimension of time in exams. Studies show that boys answer faster. Prolonging the time of exams will allow more girls to succeed. 6) It is recommended to operate a class in small groups. Girls operate better when they are in groups of girls. 7) Before each lesson it is recommended to give a general review of the material to be studied. Girls produce learning from a big scene rather than from isolated details. 8) Wait 4-5 seconds before choosing a pupil to answer a question. Girls tend to wait until the answers are phrased fully before they raise their hand, while boys tend to raise

their hand immediately and then to phrase an answer. 9) To relate learning to life, this is easier to girls.

In summary, it is very difficult to shatter stereotypes in a society on the subject of women and science. The key to a change is in an integration of many factors together which operate differently than the usual. In changing the gender tendencies, the things that can together be of assistance are: awareness of the teacher, way of teaching and the rate of a teacher's equalitarian treatment in class, the relation of pupils, counselors in school and parents. It is of importance that parents encourage and expect from girls as they do from boys in choosing and succeeding in the scientific subjects as a future occupation.



The Second conference - space to encourage education and science education

The conference held during this week indicating the ten years shuttle disaster Columbia space.

Invitation-Teachers and coordinators from scientific and technological reserve program, earlier this month, sent an invitation to the conference to encourage education and space science studies conducted by the Foundation in collaboration with the Pedagogical Secretariat Ramon and Director of Science and Technology.

We consider your participation at the conference of great importance and leverage exposure options to encourage science education with activities related to space and aviation.

The conference will be at 28 January 2013, from 15: 00-20: 00
in Israel Museum, Tel Aviv.

Were quick to sign up and ensure your place at the conference

Regards, Shoshi Cohen- Supervises the teaching of Science in Israel.

The conference program- 15: 30-15: 45 Gathering, an achievements exhibition tour and refreshments. 15: 30-15: 45 Greetings. 15: 45-16: 15 Ms. Foundation President Rona Ramon. 16: 15-16: 45 Break rich food. 16: 45-17: 15-Mr Molly Eden president of Intel Israel. 17: 15-17: 45 Mr. Leland Halloween astronaut Ilan Ramon's friend, the head of NASA Education. 18: 15-19: 50 presenting educational projects in the field of space TED format, construction of nano satellite signal Ramon, dissertations on the subject of space, Ramon Spacelab scientific leadership .19: 50-20: 00 Summary Mr. Ariel Brickman Foundation CEO Ramon. 20 :00-20 30 Exciting planetarium show.

About the Ramon Foundation –

Family Ramon has been struck twice by devastating tragedies. Her husband , Ilan , died in the Columbia shuttle accidents in 2003. In 2009 her son ' Asaf' a fighter pilot, was killed in the line of duty. After the Columbia accident, Rona Ramon supported and initiated programs which emphasize 'self-fulfillment' social responsibility and excellence among Israel's youth' as a way to honor Ilan's vision of our nation's future.

Rona Ramon continued doing so after Asaf death' deciding to unite all the projects commemorating ILAN AND ASAF under one organization- The Ramon Foundation. The mission is to influence and inspire the young people to develop character of leadership' social responsibility and personal integrity. The Foundations goals-

- 1.To encourage personal excellence and community involvement.
- 2.To promote groundbreaking excellence in academic achievement among Israeli youth.
- 3.To support STEM(Science, Technology, Engineering and Math) Education.

This conference related the research because of the emphasis on The achievement level of Israeli pupils in the fields of science and technology has long-term implications, as high-tech industries, which constitute an economic growth, are based first-of-all on quality personnel in these fields. For years the educational system has not dealt with the question of how to increase the rate of excelling pupils and the number of girls in the fields of science and technology, out of an assumption that excelling is expression of natural talent. These facts have created a need for significant increase in the rates of excelling pupils – boys and girls alike, in a program developed, by the name of “scientific technological excelling reserve”, while defining of a quality scientific matriculation certificate. In schools integrating this program, two study groups have been opened – in 7th grade and 10th grade, in order to have a continuous excelling

course. Schools that have recruited a large number of girls received additional funds.

Quantitative targets have been set for this project, as well as additional resources and focused actions.

The state of Israel has strived for years to maintain its relative advantage in the fields of science and technology. This is a purpose stated in the Industry Research and Development Encouragement Law, 1984. This is about an investment of Billions of NIS in research and development of the highest in the world. Notwithstanding, Israel might lose its relative advantage over time, without focused and planned handling of the stages of education. These facts have constituted a background to the need to make a significant change in the rate of excelling pupils in fields of science and technology in Israel. The program bases on an estimation that there is a greater potential of excelling pupils in the fields of science and technology, while giving attention to gender, from the rate of pupils that reach a quality scientific technological matriculation certificate. Without a guiding hand on the part of the educational system, the potential of these pupils would not be realized.

For this purpose, a program has been developed in the Ministry of Education, which is structured and having targets and purpose, which outcomes can be measured in a several years. The initiator of the idea is Dr. Ofer Rimon, Head of Science and Technology Administration in the Ministry of Education. Intel company and the Ministry of Education declared on mutual action programs for the advancement of technological education in Israel. This declaration was made in the visit of the CEO and president of Intel international, Paul Otellini in Israel (November 1, 2012). In order to promote education in Israel, the Ministry of Education has invested 260 million NIS and the high-tech company of Intel about 20 million NIS (5 million\$). It is a long-term investment in order to develop the high-tech industry that constitutes a vital ingredient in the economy of the state of Israel. The program of “reserve for scientific technological leadership” is a prestigious excellence breakthrough program for the promotion of the future of pupils. This course exposes pupils to advanced subjects from the field of science and technology and paves the way to being part of the future leadership generation.

The Research and conference talking about outstanding student and the importance of investment in the future generation of the country in the field of science and technology.

The Ramon Foundation slogan- To Dare, To Drive, To Inspire, To Realize The Dream!

www.ramonfoundation.Org.il



BIBLIOGRAPHY

1. Nissel O. Observation through a prism in science teaching in Junior High School "Scientific technological leadership reserve" classes with relation to gender, boys, girls, terms of acceptance, 2014.
2. www.gov.uk-2012
3. Beller M. Israeli achievements in an international view, the TIMSS tests, National Authority for Measurement and Evaluation in Education, 2012 (http://cms.education.gov.il/educationcms/units/rama/mivchanimbenleumiyim/timss_pirls_2011.htm)
4. Hativa N. Is there a patent for achieving excelling in teaching? Teaching in high education. In: Tel-Aviv University, "At the top", 2003, vol. 2, table 1, 2, 3.
5. Hativa N. To words a conceptual framework of dimensions of effective instruction: The role of high-intermediate & low instructional education & faculty development, 1999.
6. Ashkenazi R. Why and how? Report of Ministry of Education, Israel, 2007 (<http://clickit3.ort.org.il/Apps/WW/Page.aspx?ws=079d6399-6890-487a-8ed7-acec521c892f&page=a4ff8380-1ea7-4473-9eca-70814dce55e3&box=fec6497-6076-4f85-9196-599299c63e3f&pstate=item&item=78589ae4-488f-4d15-b153-ed8a5bef1eb9>).

7. Ministry of Education. Master documents, the teaching of science and technology, 2009.
8. Rimon O., Romanov, D. Treading on diamonds – Israel's unrealized potential of excellence. Working paper series, Ministry of Education, Chief Scientist, 2012, vol. 67. p. 1-2 ,5-7 ,9, 22-23, 24, 26-27 (www.cbs.gov.il).
9. Salomon G. Innovative, from constructive learning environment, 1997, p.1. (<http://www.levinsky.macam98.ac.il/2k1/products/razioria.htm>)
10. Shleicher A. Pedagogy in the information (report) assembly Brands, O. 2011, p.19-21.
11. Tamir P. 1988, p.160 (http://www.google.co.il/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CCAQFjAB&url=http%3A%2F%2Fwww.education.gov.il%2Ftochniyot_limudim%2Fdownload%2Fhalacha%2F13.8.rtf&ei=BD_uU6zYKfGA7Qa7zYG4DQ&usg=AFQjCNFhZGZ_FV_D83KonQr2BOhHmId1IQ&sig2=799HlnS3GtxrLuLGDpU4QQ)
12. www.technion.ac.il , 18.7.2012
(<http://www.intel.co.il/content/www/il/he/newsroom/news/2012/mobilizing-scientific-leadership-training-program.html>)
(<http://cms.education.gov.il/EducationCMS/Units/MadaTech/HinucMadaTech/MeidaPirsUmim/Matkshoret.htm>, 1.11.2012, p.1).