



## **Ilan Ramon Center Activities**

### **Executive Summary**

February 2014

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#### **Program Description**

The Ilan Ramon Center (IRC) works to advance science and technology education in the southern region. It is supported by the Ministry of Education, the Municipality of Be'er Sheva, Ben-Gurion University of the Negev, Rashi Foundation and Beit Yatziv. IRC operates 12 programs that introduce school students to physics, provide enrichment and nurture excellence in this field. It allows students of all ages and backgrounds to access up-to-date knowledge and sophisticated physical facilities, along with instruction and guidance from professional counselors and advisors.

#### **Purpose of the Study**

To examine the effectiveness of the programs offered at IRC, and the extent to which the interventions lead to the desired outputs and results; to provide formative information that could help improve the implementation of the programs and make it more efficient.

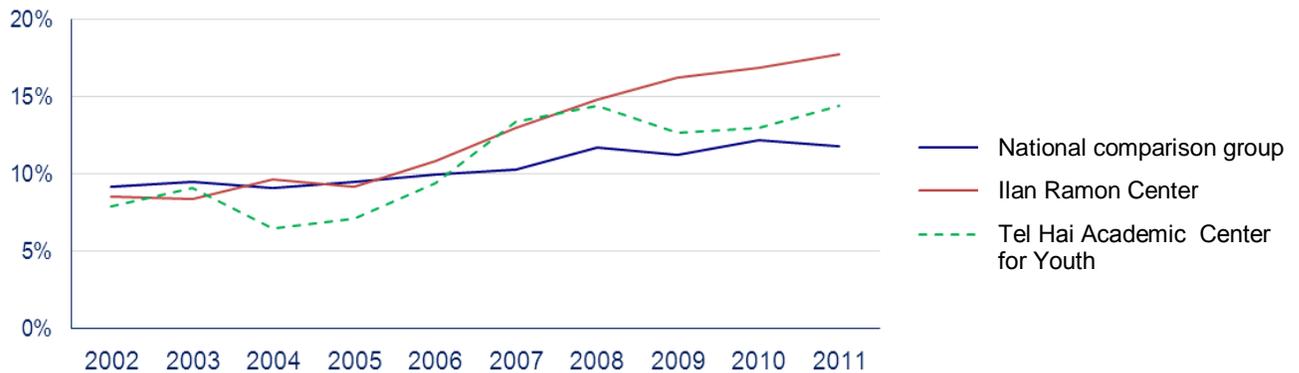
#### **Methodology**

The evaluation was based both on hard data (from the Ministry of Education and IRC) and on questionnaires and focus groups of students. The matriculation results of schools that participate in IRC programs were compared with a nationwide comparison group. The questionnaires were given via to students at the beginning and at the end of the program, and to teachers and instructors.

#### **Main Findings**

- In the schools taking part in the program there was a sharp increase in the rate of students taking Physics matriculation – from 8-11% before the program began (2002-2006) to 18% in 2011. In the comparison group, the rate across the same period remained stable at 12%. It must be emphasized that the increase in the number of Physics students did not come at the expense of the quality of their grades.

### Percentage of students taking Physics matriculation out of all 12<sup>th</sup> grade students



- IRC had a clear impact on the grades in the intensive-level matriculation. Until 2006, before the program began, the percentage of excellent students in Physics (grade of 85 or above) averaged at 36%, and this figure rose to 42% after the program began. During the same period, the comparison's group average of excellent students fell from 48% to 46%.
- In schools with IRC intervention, dozens of students submitted final research projects; in 2011 for example there were 52 such students. In contrast, among the comparison group there have been only a small number of students in this category over the years.
- Around 75% of students felt that the studies at IRC contributed to deepening of their knowledge of Physics in particular and of science in general. Some 62% said that the studies helped them understand topics that they had not understood in other ways – this comment was especially noted among students who wrote final research papers.
- Around 60% felt that they had improved their skills in conducting experiments independently, in researching science topics and in writing a research paper. This was particularly noticeable among students who wrote final research papers.
- Most students were pleased that they had decided to write a final research paper and felt that it contributed to an in-depth understanding of the topic they were working on. In particular, the contribution of the final research paper was noted in acquiring skills for independent learning, in the process of writing the paper, and in the paper's level. Around 70% of instructors thought that by writing the final research paper, students gained in-depth understanding of the topic and acquired new knowledge in the field. They also thought that the involvement of students in experiments was high and that the papers were of a high level. Only 43% thought the students learned to work independently.
- 60% of instructors thought that students are highly motivated. However, less than half thought that the students invest "over and above" in order to succeed, and the same rate thought that the program accepts students who are not suitable. These findings raise the need to examine the recruitment methods and the selection process in order to make the program focus its efforts on students who are the most suitable.

- The programs aiming to expose younger students to Physics had some 2,500 participants in 2013-4. Two-thirds of 5th grade students showed an interest in science and nearly 40% said that they take part in science activities. One-third hope to work in a science-related field in the future; these rates did not rise as a result of their participation in the program. Around two-thirds were satisfied with the instructors and the atmosphere of the program.
- The list of students taking part in the program is finalized only at a late stage of the activity. This does not allow the program managers to follow up on the number of participants, how many drop out and when, and causes various administrative problems.

### **Conclusions and Recommendations**

The central aim of the IRC is to increase the number of students taking Physics matriculation in general and in particular at the intensive level, and to raise the number of students who excel in Physics. The findings indicate that it succeeds in doing so while keeping the grades high, in both the Jewish and the non-Jewish sectors. Nevertheless, the rise in the number of Physics matriculation students occurs less at the intensive level, which has stayed steady at 9-10% for a number of years. Furthermore, the rate of excellent students in the southern region is still significantly lower than in the other regions.

An issue that must be addressed is the standard of the students that are accepted to the programs. There needs to be a serious discussion about how to improve the program's outreach strategy so as to recruit students with high potential while filtering out unsuitable students. Focusing on the high-potential students will be a more efficient use of IRC's resources.

Both the students and their school teachers believe that the level of research papers that they prepare with the assistance of the instructors is high. At the same time, there seems to be over-involvement on the part of the instructors. IRC should put more emphasis on developing skills for independent research and study; and the instructors should be trained to work in a differential manner with students, according to their different needs.