Imparting Emotional Skills in Programs for Outstanding Students

Effective Research for Impact (ERI)

Many students can succeed in the excellence tracks, but for various reasons, they do not choose to study in them, or they drop out along the way. Some of this relates to emotional reasons which are tied to the students' mental resilience. Lack of such resilience can occur in both strong and competitive environments but is more prevalent in weaker environments with a dearth of options and encouragement for success. We sought to examine which social-emotional skills students with potential need to help them develop mental resilience, to allow them to choose and persevere in excellence tracks.

We turned to Effective Research for Impact (ERI), an organization that promotes social impact by harnessing research for the practical needs of social action. We asked them to conduct research that includes a research literature review examining which social-emotional skills are important to promote in programs of excellence in science. We also asked the researchers to identify science programs from around the world with proven best practices for imparting selected social and emotional skills to excelling students. We wished to know how these programs impart these skills, how they measure them, and whether there are common principles for action from which we can learn.

Main findings

1. From the list of skills required for outstanding students, five social-emotional skills were selected that are relevant to choosing excellence tracks and reducing dropout rates: perseverance, coping with heavy workloads and failure, self-efficacy and envisioning the future (with an emphasis on female students and disadvantage sectors), self-management (with an emphasis on time management and self-responsibility), and self-motivation (i.e., motivation and curiosity).
2. The ability to persevere develops best indirectly through experiential learning, utilizing a combination of ongoing experiences and long-term projects.
3. Envisioning the future is attained by the modelling of successful graduates who come from backgrounds similar to those of the students.
4. Motivation develops first and foremost indirectly, through experiences that arouse interest and success. Interest is created through a combination of exposure to current scientific topics alongside significant sensory experiences in laboratories using the latest research tools, or through simulations of virtual and augmented reality. Success is experienced through overcoming a challenging task tailored to the target audience, such as a project-related research assignment.
5. Self-efficacy is instilled by trying out modified tasks and experiencing non-trivial successes.
6. Curiosity can develop along two paths. The indirect route creates interest through exposure to topics and practical experiences, while the direct route fosters curiosity through focused training in the technique of asking questions, implemented in dedicated programs or within subject areas.

7. Self-management and time management can be instilled through direct practice. Since these skills occur in a context of concrete tasks, they can be integrated within a framework of lessons in science-technology subject areas.
8. The ability to cope with experiences of overload and failure, as well as perfectionism (at minor and medium levels), is imparted through specific practices based on psychological literature and research, such as CBT (Cognitive Behavioral Therapy) and CBM (Cognitive Behavior Modification).
9. Limited programs that focus on separated practices are suitable for the formal education system, while holistic programs that include diverse components are less appropriate.
10. It is particularly important to expose youth from under-represented populations to role models and practical experience that enable them to imagine themselves in an experience of success. The use of digital techniques can help make quality education available, especially in geographic peripheries of Israel.
11. Among the ten programs selected for the research, there was one program in which students acquired skills independently through the use of video clips and exercises for coping with anxiety and failure; two programs were taught exclusively by school teachers and focused on time management skills and the technique of asking questions to stimulate interest and curiosity; three programs were transmitted by combined teams of professionals (from academia, industry, and others) and teachers, addressing envisioning the future, developing curiosity and motivation; and, in four programs, the program staff was external, focusing on perseverance, time management, perfectionism, and motivation.