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Attracting Students to Science, Technology and Engineering Higher Education

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The benefits of science, technology, engineering and mathematics (STEM) to society are widely recognised, since, to remain competitive in the global economy and maintain the level of innovation, the education system must provide an ever expanding and highly talented pool of STEM professionals (see [1] and [2]). However, the number of science and technology graduates is not increasing fast enough to keep up with demand from industry and academia [3] and therefore, recruiting students to STEM programmes is seen as a major problem in most European countries [4].

The ATTRACT research project "Enhance the Attractiveness of Studies in Science and Technology", has emerged to meet these challenges and it aims at increasing the knowledge of different aspects of student recruitment to STEM education and understanding how students' retention in these areas can be improved (see [5] for detailed information about the project). This paper reports on first-hand Instituto Superior Técnico (IST) results, as part of WP7 research, which chiefly focuses on how to attract students to STEM programmes.

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The study involved the comparison of 583 secondary students and 1796 IST freshmen students' background and perceptions on three key areas: parental background, motivation to undertake a university programme and perceptions of engineering studies and profession. In addition, it was compared how those students perceive other professions in terms of difficulty of the profession, effort required to undertake the programme, pay level and employers' recognition, since knowing how these perceptions diverge may shed some light on new approaches to attract students to STEM programmes.

Key findings from the two surveys reveal that typically, engineering students are more likely to have at least one of the parents who have studied engineering or teaching. Notice however that IST students might not distinguish clearly between an engineering background and a teaching background when parents teach at an engineering institution. Either way, this could provide an exposure to engineering that could influence students' career path [6].

In most aspects both secondary and IST students have similar reasons to choose the programmes and universities. However, engineers' importance to the country development is perceived differently, while most of the engineering students believe that engineers play a very important role in country's development (72%), only around 30% of the secondary students seem to share this view. Moreover, IST freshmen perceive engineering as being much more difficult to perform, as well as requiring much more effort to undertake the programme, than secondary students. Likewise, they believe that the pay level and the employers' recognition are better than secondary students do.

Results and outputs among secondary and freshmen students point out that there is a misalignment between their perceptions. A strategy to recruit more students to the engineering field should benefit from an alignment of secondary students perceptions. This paper brings contributions relevant at different levels, namely to academic discussion on the topic, to higher education organization management and also to help guiding policy making and design of specific public policies aimed at attracting more students to STEM programmes. ■

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