

Technical University of Košice

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Conclusions from the analysis before

Based on the ANALYSIS BEFORE, the conclusions for “Lessons Learned” can be summarized in three areas. The first area concerns national findings where the following should be considered:

- 1 Employers (especially in the automotive industry and in the IT sector in Košice) have been complaining about the lack of skilled labour for several years. Industry 4.0 has brought and continues to bring increased demands for the introduction of new technologies, on the one hand, and the changed requirements for graduates on the other.
- 2 Unfavourable demographic development is also associated with a decline in the number of 19-year-olds admitted to universities. Since 2010, the number of 19-year-olds has dropped by more than 26%, but the number of first-grade admissions to tertiary education has fallen by more than 39% over the same period. For the years 2007–2017, the number of public higher education students decreased by almost 39%, while in the case of private universities the decrease was 56%.

- 3 Most public university students in the first two stages study in social sciences, teaching and services.
- 4 In natural and technical sciences, graduates are highly sought in the labour market, about 25% students study in these fields, which is almost about five percentage points less than the EU average. It is even less on average in V4 countries (by almost three percentage points).

The second area of findings from ANALYSIS BEFORE focused on the Faculty of Electrical Engineering and Informatics (FEI) at the Technical University of Košice.

In 2015, the Department of Computers and Informatics launched the project “Live IT Projects” as an effort to introduce dual education. The project is designed for fourth-year students and is the largest event of its kind in Slovakia. The event links several universities and companies with active student participation throughout the semester. The number of companies and students involved is increasing from year to year. 14 companies and 116 students participated in the 2015/16 academic year, while 21 companies and 171 students participated in the 2018/19 academic year. 30 mentors from universities and the IT companies involved provided expert assistance to

gain practical experience not only in technology and programming, but also in teamwork, project management and agile software development.

FEI has long-term cooperation based on the dual education principles with the company T-Systems.

Finally, the conclusions of the Analysis before for the second faculty involved in EDU-LAB, the Faculty of Manufacturing Technologies in Prešov (FVT) will be presented. The faculty has long-term cooperation with enterprises, which is constantly expanding.

Nowadays, students of the 2nd year of engineering degree can participate in SPICE (Student Program of Integrated Company Education), a joint project of the Automotive Industry Association of the Slovak Republic, the national development project AZU.sk, industrial enterprises, and especially technical college students. The aim of the program is to enable students to work on their diploma project through practical experience. In addition, often after graduation, a graduate remains in the company to work. The involvement of students in the program is gradually increasing.

Conclusions from the analysis after

As part of the ANALYSIS AFTER, stakeholders (companies, students involved in project SPICE and FVT) were asked to provide feedback on the experience gained in participating in the project.

From the part of employers, 25 companies (20 involved in the SPICE project and five with whom the FVT is interested in working in the future) answered the questionnaire. The most interesting findings were:

- In addition to SPICE, the companies most often cooperate in solving year-long student projects, final theses (diplomas and in one case there is also co-operation in dissertations), fifteen responses related to the concluded contract with FVT on economic co-operation; enterprises allow excursions in their production facilities; but there is also cooperation on various national projects and three companies provide selected lectures within a particular subject.
- Enterprises in collaboration with FVT most appreciate getting new insights and bold, innovative ideas in solving problems, as well as the enthusiasm and flexibility of young people.

On the other hand, SPICE students appreciated the following the most:

- The possibility to work in real conditions on real problems of selected companies
- Experiencing that they can take responsibility for the tasks assigned to them and that they have the the ability to be creative and flexible in thinking and acting
- Ability to identify and solve problems

However, students also gave the faculty significant feedback by answering the question concerning identifying the greatest differences between the level of competences required by businesses and the level of competence development they had achieved through the FVT. The most frequently mentioned were:

- Knowledge and ability to communicate in a foreign language (especially at a technical level)
- Ability to work in an intercultural/international environment
- Ability to take responsibility
- Ability to identify and solve problems

Lessons learned and recommendations

Dual learning brings with it a number of challenges that need to be responsibly approached and which must be solved. The EDU-LAB project has shown that other technical faculties in Slovakia as well as other

countries are working on very similar issues that TUKE is working on with the two faculties involved in EDU-LAB. It is difficult to briefly describe the most serious problems that are waiting for a solution in the near future. Some of the most serious problems are the following:

- the need to invest effectively in high quality, modernized and reformed education and training;
- promote lifelong learning opportunities for all and at all levels of education and training, in particular by increasing the attractiveness and relevance of vocational education and training;
- adapt to new requirements and trends in order to ensure better matching between graduates' skills and labour market needs;
- the way of administration and implementation in the dual education system should be as simple as possible and use clear administrative procedures so that no concerned sides have to deal with unproportional burdens;
- improve the system of dual education based on international examples in order to increase cooperation between schools and SMEs. Large businesses would have a chance to make more use of the corporate school system;
- pay increased attention to the creation and strengthening of soft skills and language skills

Further steps

TUKE is working on establishing the accreditation of professionally oriented study programs, the Faculty of Manufacturing Technologies in Prešov is preparing the accreditation of three such programs (Automotive Production Technologies, Computer Aided Manufacturing Technologies and Manufacturing Management). FVT has decided to create accredited vocational programs in order to support the linking of higher education with the needs of the labour market, through the support of the creation of professionally oriented bachelor study programs in accordance with the Criteria for Accreditation of Professional Oriented Bachelor Study Programs of Higher Education and Support of Solvency Capabilities.