

# Career path surveys of university graduates as the main source of knowledge on educational mismatch



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### Annotation

This article offers a systematic research of job placement conditions for university graduates in Poland, based on an analytical generalization of the results of pilot surveys of representatives of Cracow University of Technology, which have been systematically conducted by the university since 2006. Using relevant methodological tools, it provides an evaluation of the quality of teaching at the university, the characteristics of the employment of graduates, the time spent searching for employment and the specific features of the development of a professional career. It was established that the data collected and developed monitoring methodology can be used effectively for the research of existing deformations in the university education system as well as the scale and prime cause for the discrepancies between higher education institutes and the labour market.

Key words: conditions for the job placement of graduates, teaching efficiency, employers' competence expectations, structural deformations in higher education, labour market.

## Introduction

Higher education system in Poland as a part of educational system regulated by a unique law<sup>1</sup> had gained significant autonomy over the 1990s.<sup>2</sup> According to the aforementioned law, public and private higher education institutions are defined as self-governed establishments, which are allowed to offer independent study programs in a liberal fashion, with the role of the government being restricted to determinate organizational and competence frameworks (fields of study, standards etc.). As a consequence, the number of students and university graduates had increased significantly since the beginning of 1990s (Figure 1). As the share of students stood at just 9,8% of school-age population at the beginning of transformation process, this indicator had increased to 25,4% in the 1998/99 study year. The number of students has been stabilized at the level of 37–38% since then.

It has been widely accepted until recently that a higher scolarization ratio is almost automatically transformed into higher wages, lower unemployment and higher GDP growth rate<sup>3</sup>. However, there are more and more empirical evidences recently that an increase of expenditure on education, especially on the tertiary education, does not guarantee as high individual and public

<sup>1</sup> The Law on Higher Education was adopted on September 12, 1990, with amendment of July 27, 2005.

<sup>2</sup> Autonomy of higher education institutions is guaranteed by the Article 70 of the Constitution of Poland.

<sup>3</sup> Barro Robert. Economic growth in a cross section of countries // *Quarterly Journal of Economics*. — 1991. — Vol. 10. — No. 2. — P. 407-443; Krueger Alan and Lindahl Mikael. Education for Growth: Why and for Whom? // *Journal of Economic Literature*. — 2001. — Vol. 39. — No. 4. — P. 1101-1136; Lucas Robert. On the mechanics of economic development // *Journal of Monetary Economics*. — 1988. — Vol. 22. — No. 1. — P. 3-42; Sala-i-Martin Xavier. I Just Run Four Million Regressions // NBER Working Paper No. 6252. — Washington: National Bureau of Economic Research, 1997.

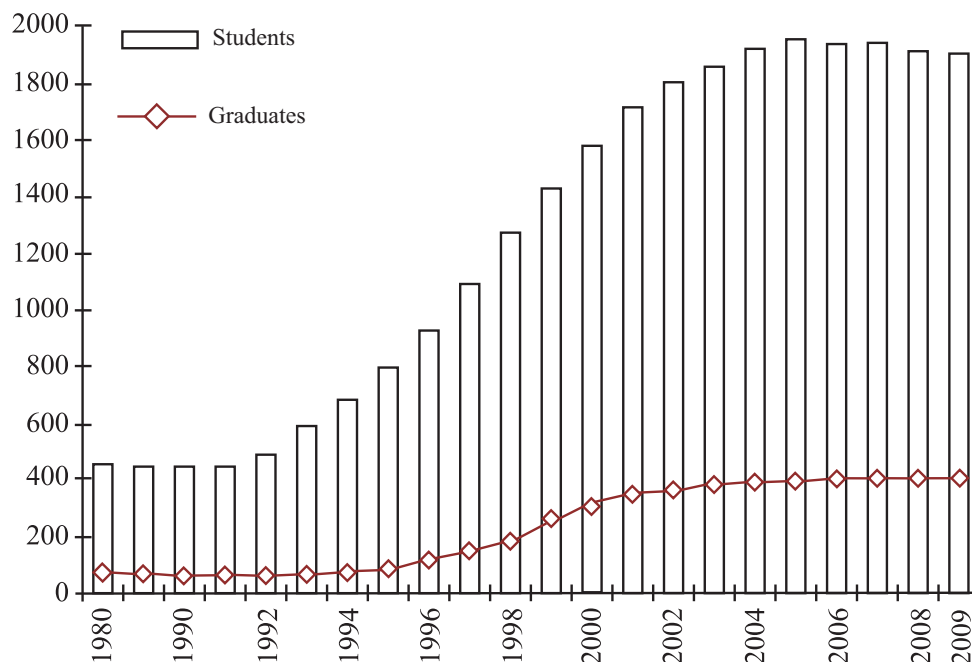


Figure 1. Poland: the number of students and university graduates, 1980–2009 (thousand persons)

Source: GUS.

returns as it is suggested by numerous theoretical models<sup>1</sup>. In the context of the new endogenous growth theories, there is an increased interest in many countries, including Poland, in the deepening mismatch between university education and labor market demand.

Career path surveys of university graduates are among the most reliable sources on structural<sup>2</sup> and competence<sup>3</sup> mismatches. Having been originated as individual university initiatives, this kind of surveys have been gradually transformed in many countries into systemic studies<sup>4</sup>, involving more and more institutions, and ultimately covering the whole country. Monitoring of the career path of graduates allows forecasting of the demand

for university-educated labor force across specific branches of the economy, and becomes more and more often the main argument behind deliberate government interventions aimed at steering future students towards specific educational institutions and fields of study, which provide with competences demanded on the labor market<sup>5</sup>. Published reports on the career path studies are the important source of knowledge about the competence level of university graduates for employers and make it easier to conduct university recruitment. Career path surveys have the microeconomic dimension as well, being used by higher education institutions for marketing purposes, besides of monitoring of the quality of teaching. Dissemination of information on the university graduates performance on the labor market, their workplace status, wage level and employment contracts (temporary or permanent) has an important impact not to be downplayed on the choice of the field of study by youngsters.

<sup>1</sup> Siwinska Joanna. Badanie roli edukacji w rozwoju gospodarczym // *Ekonomista*. — 2007. — Nr 5. — S. 675–690.

<sup>2</sup> Structural mismatch is caused by the choice of irrelevant field of study by students, which does not match the structure of demand for university graduates on the labor market.

<sup>3</sup> Competential mismatch results from a low quality of education, regardless of the status of the field of study — either matched or mismatched, i.e. with the surplus of students.

<sup>4</sup> An extensive survey of the European experience could be found in *Analysis of Graduates' Career Path. Instrumental tools and methods in the EU Countries and Poland* (Analiza losow zawodowych absolwentow. Narzedzia i metody w krajach UE i Polsce / J. Zyra (red.). — Krakow: Politechnika Krakowska, 2007).

<sup>5</sup> Freeman James and Hirsch Barry. College majors and the knowledge content of jobs, *Economics of Education Review*. — 2008. — Vol. 27. — P. 517–535; Zietz Joachim and Joshi Prathibha. Academic choice behaviour of high school students: economic rationale and empirical evidence // *Economics of Education Review*. — 2005. — Vol. 24. — P. 297–308.

The goal of this paper is a presentation of the results of the pilot career path study of the graduates of Cracow University of Technology (CUT), which has been performed on a systematic basis since 2006. Organization and methodology issues are outlined in Section 1, with the selected results of the CUT graduates assessment of the study program, workplace conditions, an average time for the first job search and specific features of career path development being presented in the next two sections.

### Organization and methodology of the survey

Applied multiannual research activities by the Institute of Economy, Sociology and Philosophy (IESP) at CUT are centered around the project titled «Enhancement of contemporary education of an engineer, manager and leader in the humanistic and economic aspects». The research is focused on the utilization of academic knowledge by university graduates on the labor market. As a consequence of the IESP research activities, the CUT had pioneered among the technical universities in Poland monitoring of the career path of its graduates after six months on graduation (starting in 2006) and after five years on graduation. These activities have benefited substantially from participation of IESP in the international research project financed by the European Union «HEGESCO – Higher Education as Generator of Strategic Competences». Starting in 2011, career path surveys of graduates with three years job experience have been started.

A specialized unit for study of education and labor market effects has been functioning at IESP since 2008, conducting research activities across three separate fields:

1) study of career path of graduates after 6 months, 3 and 5 years after graduation, which are focused on the field of study match, degree of the utilization of competences (acquired and developed during the study period), preconditions for job promotion, as well as specific features of the «competence gap»;

2) analysis of the competence expectations by employers, comparison of study effects on particular fields of study and educational levels with the labor market expectations;

3) analysis of educational strategies by higher education institutions aimed at better compliance with the labor market requirements, such as identification of the effective methods of teaching, effective cooperation with the business environment, and elimination of harmful barriers between higher education institution and labor market.

A pioneering study of the career path of the CUT graduates from the 2005/2006 academic year after six months from graduation had been initiated and conducted by IESP in cooperation with the Careers Service within the scope of the ZPORR Project, financed by the European Union and Polish government under the auspices of the European Cohesion Fund<sup>1</sup>. Conditions for the labor market entry and job satisfaction for 787 graduates (56% of all graduates of the 2005/2006 academic year) had been studied. Telephone survey combined with preparation of the answer sheet by a canvasser had proved to be the most effective way of conducting a survey, with 81% of answers received. The group of five canvassers under supervision of assistant of the project coordinator conducted surveys mainly during evening time (between 19 and 22.30 o'clock) and afternoon time (from 13.30 to 15.00 o'clock). All activities had been completed by funding of the project at 200 000 PLN.

Subsequent surveys of graduates had been realized by IESP independently by financing through individual research funds and partial support from the CUT leadership which provided with a paid managerial position. Main research instrument, i.e. survey sheet disseminated by email, has been modified over the research study period. Specifically, several positions have been added to the survey sheet of 2010 such as:

- opinion regarding the study program;
- time for starting the job search;
- education level which is the most adequate for the current job position.

At the same time the question on the employment during the study period has been eliminated from the answer sheet, as part-time employment for students is monitored by the Careers Service.

On the initial step of the survey, organizers faced several law and organizational obstacles, as misinterpretation of the law on personal data security led to concerns of a few departments regarding the use of e-mail addresses, telephone numbers or mailing addresses for the research purposes. Another setback was the lack of department databases containing addresses of graduates. However, university departments and the institution on the whole got much better

<sup>1</sup> Methodology and results of our research activities are summarized and published in the monograph titled *First steps on the labor market: the study of career path of the graduates by the Cracow University of Technology, research tools, methodology and results for the pilot survey for the year 2005/06* (Zyra, J. Pierwsze kroki na rynku pracy. Badanie losow zawodowych absolwentow Politechniki Krakowskiej, narzedzia badawcze, metodologia i wyniki badania pilotazowego rocznika 2005/06. — Krakow: Politechnika Krakowska, 2007).

prepared for career path surveys over last few years. Among documents for students of the last year of study, agreement for participation in the career path survey is included. If agreed, student provides with his/her e-mail address and cell-phone number. For initial preparation of the database with addresses of graduates, cooperation with administration of departments is of high importance. Unambiguously, direct contact of organizers of the survey with graduates during the solemn ceremony of diploma awarding which used to be organized at the department level makes start of the survey procedure more efficient.

## Information collected from graduates over the 2006–2010 period (after six months from graduation)

Survey data allowed for analysis of the quality of study programs and career path patterns of the CUT graduates just after graduation.

### The study program

— More than 60% of graduates declare that they would repeat their choice of the educational institution and field of study (Figure 2), and 40% of 2010 graduates consider that their study had high public status and the study program was highly demanding in the intellectual sense, contributing to the development of either professional or general competences with wide spectrum of possible use. Studies at CUT are viewed as a solid foundation for future personal career, development of professional competences, and finding a job. For 65% of graduates in 2010, obtaining the master degree is very useful for current professional duties in the workplace.

— As much as 50% of graduates have started improvement of their competences, such as knowledge and professional skills, IT, communication and language skills, during the study period (Figure 3). Main motivation for taking training programs was better adaptation for the labor market demand as well as personal interest. Vast majority of graduates reveal their interest in continuation of postgraduate studies.

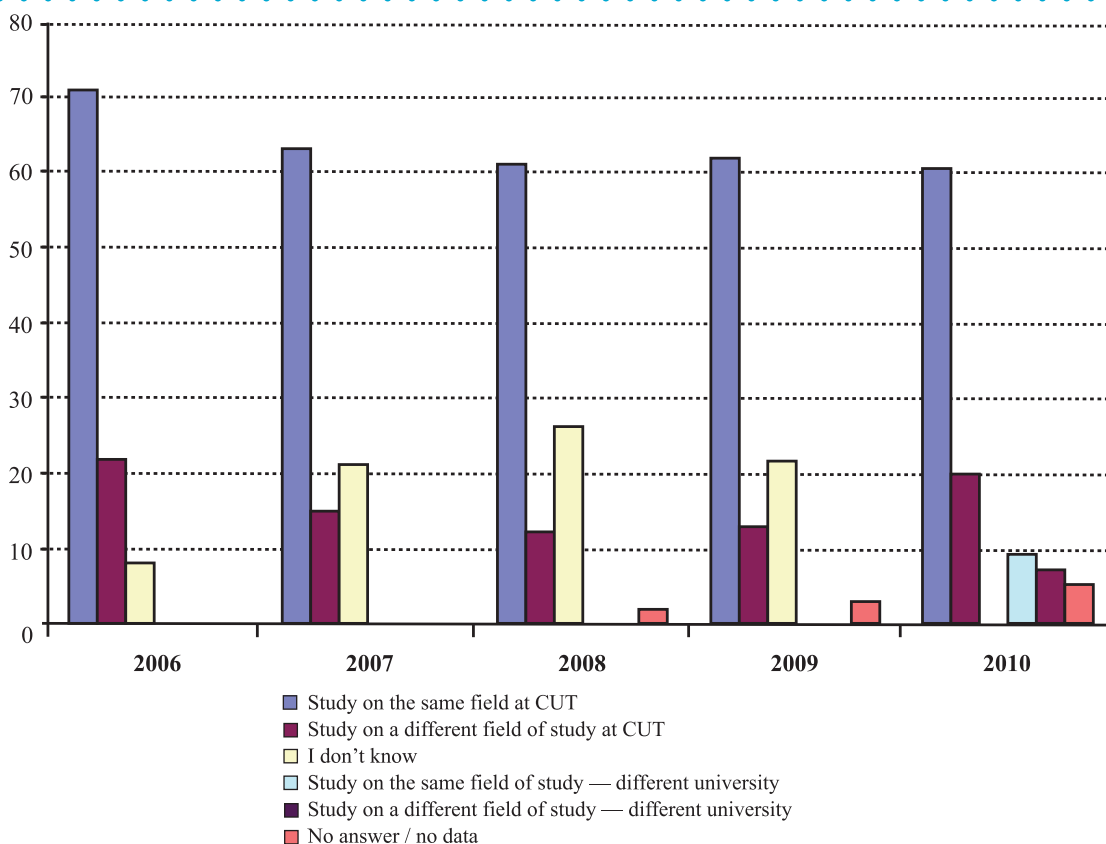


Figure 2. Response on the question regarding the renewal of the educational institution and the field of study by the graduates over the 2006–2010 period (% of surveyed)

Source: author's calculations.

**Employment**

— Six months after graduation, 80% of respondents declare a full match between their study and job requirements, with the field of study being an important factor behind obtaining a job. Almost 90% of employed graduates have signed their contracts even before graduation of just after it. Majority of the graduates are employed by domestic and international small and medium enterprises (SMEs), while about 35% are employed by large corporations. According to graduates, main barriers for obtaining a permanent employment are non-attractive job offers on the labor market in respect to wage level and career prospects. Almost 33% of respondents treat their first job as a base for career development and a source of skills improvement. About 30% of graduates are going to stay with their employer for a longer span of time.

— Knowledge and professional skills, interpersonal communication skills, team management, general knowledge and language proficiency (in English) are considered as most frequently used competencies in the workplace (Figure 4).

— About 60% of employed graduates are considering an establishment of their own private firm in the future (Figure 5). As revealed by the study, decision on setting up a firm just after graduation is undertaken quite rarely. As of 2010, just over 10% of respondents have such intentions. What is important, in the majority of instances the profile of a firm is relevant to education obtained. Personal ambitions, higher earnings and family traditions are mentioned as main motivations for starting a private firm.

— Based on the results of our studies over a five-year period, it is observed that graduates more and more often reject the first job offer on the basis of too low wage and lack of career opportunities.

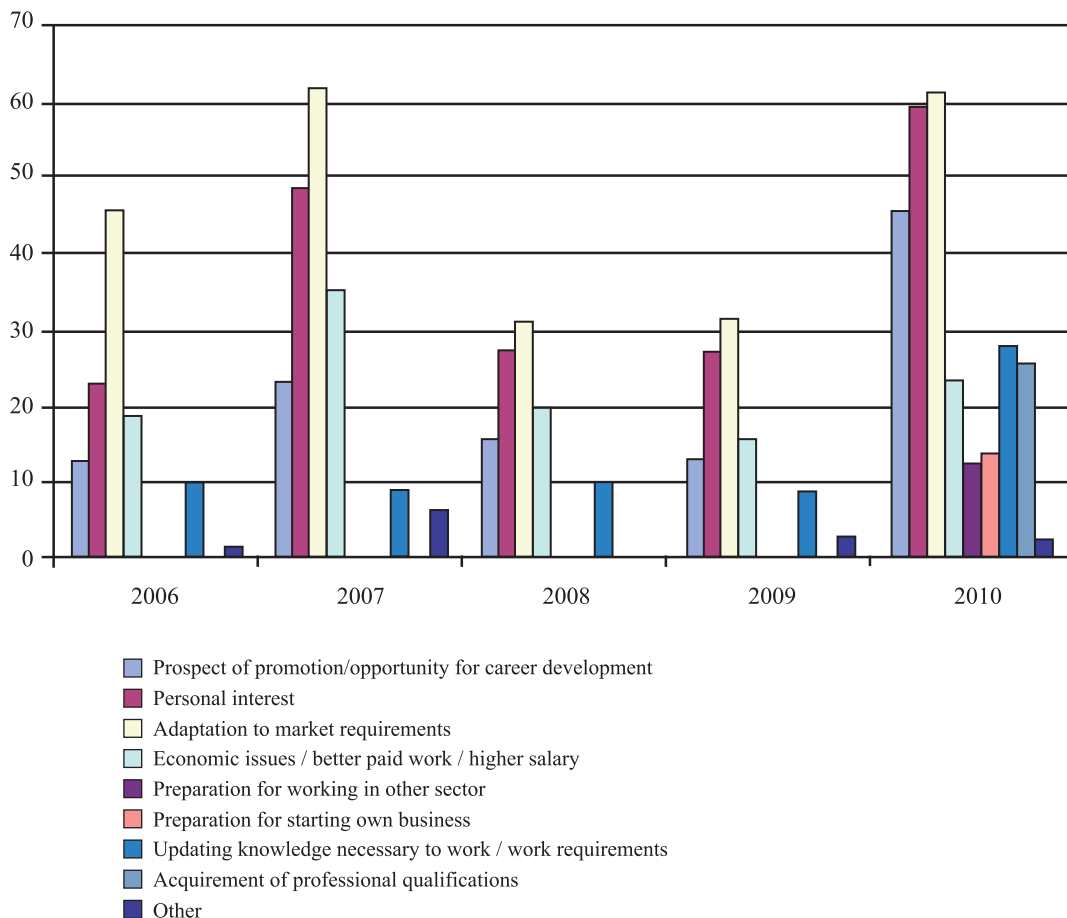


Figure 3. Most frequent explanations for participation in extra courses and training programs by graduates over the 2006–2010 period (% of surveyed)

Source: author’s calculations.

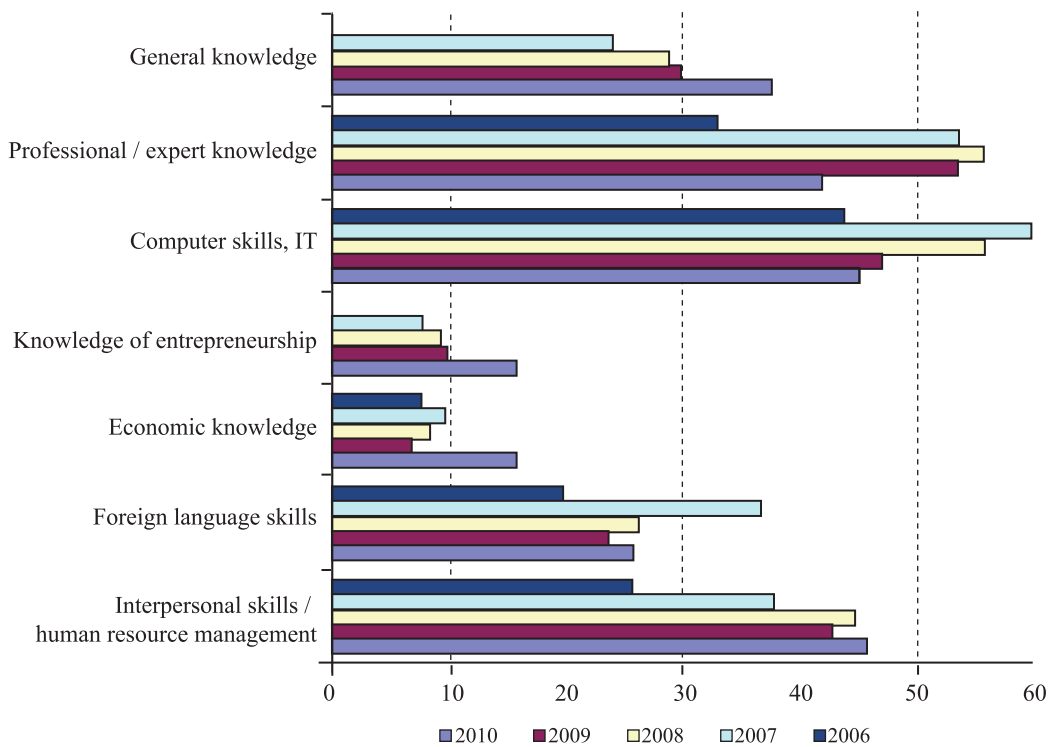


Figure 4. Most frequent competences indicated by graduates over the 2006–2010 period (% of surveyed)

Source: author's calculations.

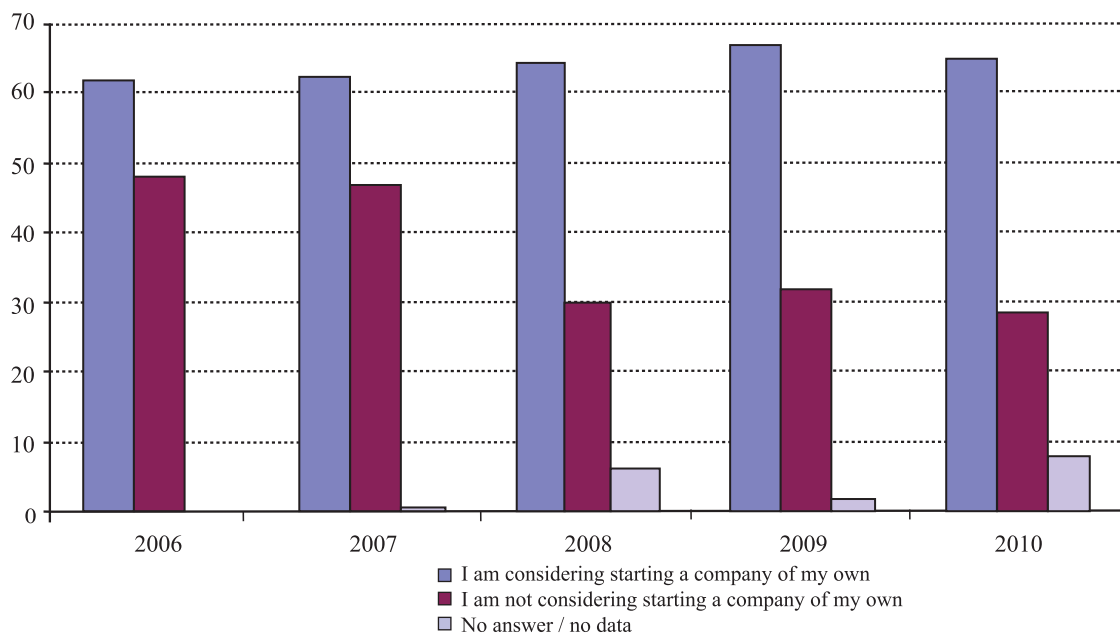


Figure 5. Percentage of graduates over the 2006–2010 period that consider setting up their own firm in the future (% of surveyed)

Source: author's calculations.

### Information collected from graduates after 5 years from graduation

First study of the career path of CUT graduates after five years from graduation had been conducted among persons graduated in 2003. Obtained information allows for:

- Identification of conditions for entering the labor market by university graduates.
- Definition of the professional status of graduates on graduation.
- Explanation of the career path of university graduates.
- Assessment of firms which employ graduates in the context of innovative processes.
- Analysis of current employment situation by graduates.
- Assessment of the level of acquired competences and those ones used in the workplace.
- Assessment of the level of satisfaction from university studies.

It was extremely difficult to contact graduates of the year 2003. Based on the information obtained in the departments, 1481 answer sheets were disseminated by mail. Simultaneously, answer sheets were sent to graduates through Nasza Klasa and GoldenLine. Finally, 111 answer sheets were received.

#### Study

– From the vantage point of five years in professional activities, 83% of respondents declared that they would have chosen CUT again as their higher education institution, with 66% of respondents confirming their choice of the field of study. According to the graduates, their study had served as a proper basis for personal development and prepared for fast on-the-job training and acquiring professional competences necessary for performing of their duties. University study had created a very useful platform for the career path.

– Based on the scale from 1 to 5, *Automatic Control Engineering and Robotics* as well as *Electrotechnics* had the most demanding study programs, with *Electrotechnics* and *Environmental Engineering* having the most universal profile of the study (Figure 6). According to the survey results, *Construction and Engineering Structures* and *Transport* carries out the highest level of academic prestige. The lowest scores have been given to the flexibility of the choice of academic subjects in such departments, as *Automatic Control Engineering and Robotics*, *Mechanics and Machine Design*. Employers in the fields of *Construction and Engineering Structures* and *Environmental Engineering* have the best knowledge on the study program.

– During their period of study, graduates tended to obtaining very good marks (60%), but only a half of them had been preparing for classes in the range that exceeded examination requirements. Lectures, focus on theory and paradigms, problem-oriented studies, projects, written tasks are among the most memorized methods of teaching during the period of study. Participation in the research projects at the university had been rather marginal.

#### Employment — First job

– Immediately after graduation, 78% of graduates had signed their employment contracts, with 23% of them continuing the job obtained during the study period. Strategy of the first job search had been highly diversified, as 68% of graduates started looking for a job at the end of study program and just before the diploma qualification, and 25% of them contacted with employers during the study period. 70% of respondents had found employment in less than two months, and 32% of graduates in less than one month. Contact with the employer on one's own was the most effective method of the first job search (32%). The first job contract for 55% of graduates had been temporary, but in 40% of cases it was permanent. Any additional on-the-job training was not necessary for 75% of the graduates. A match of the first job with the field of study is reported by 56% of respondents, and for 13% of them it was a related field of study. Recently, employment on the first workplace is continued by a half of the graduates surveyed.

– Self-employment is practiced by 8% of graduates.

– Among graduates that never been employed since graduation, more than a half of them have not been interested in obtaining a job. Those of graduates who looked for a job have found a workplace in less than six months in 76% of cases (Figure 7).

#### Employment — Status in the workplace

– About 1% of respondents are not looking for a job, with 21% of all those who are employed being on maternity leave or taking care of a family member.

– In respect to the first job, there is an increase by 10% of the group of graduates that are employed in line with their field of study (up to 67%). On the other hand, there is a decrease down to 8% of graduates with job offers matched to related fields of study.

– Above 70% of graduates are employed not in accordance to their first job. Nobody have duties below qualification level, or being underutilized in the workplace.

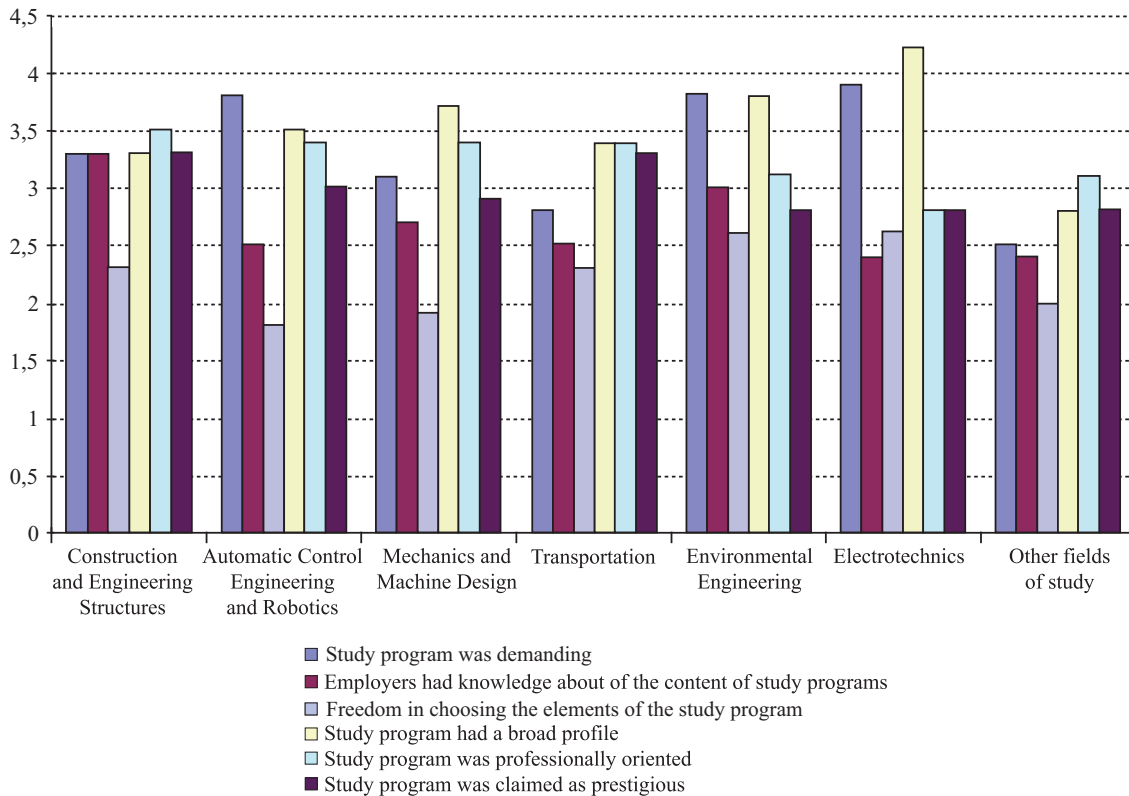


Figure 6. Opinion of the respondents graduated five years ago on their studies (scale from 1 to 7)

Source: author's calculations.

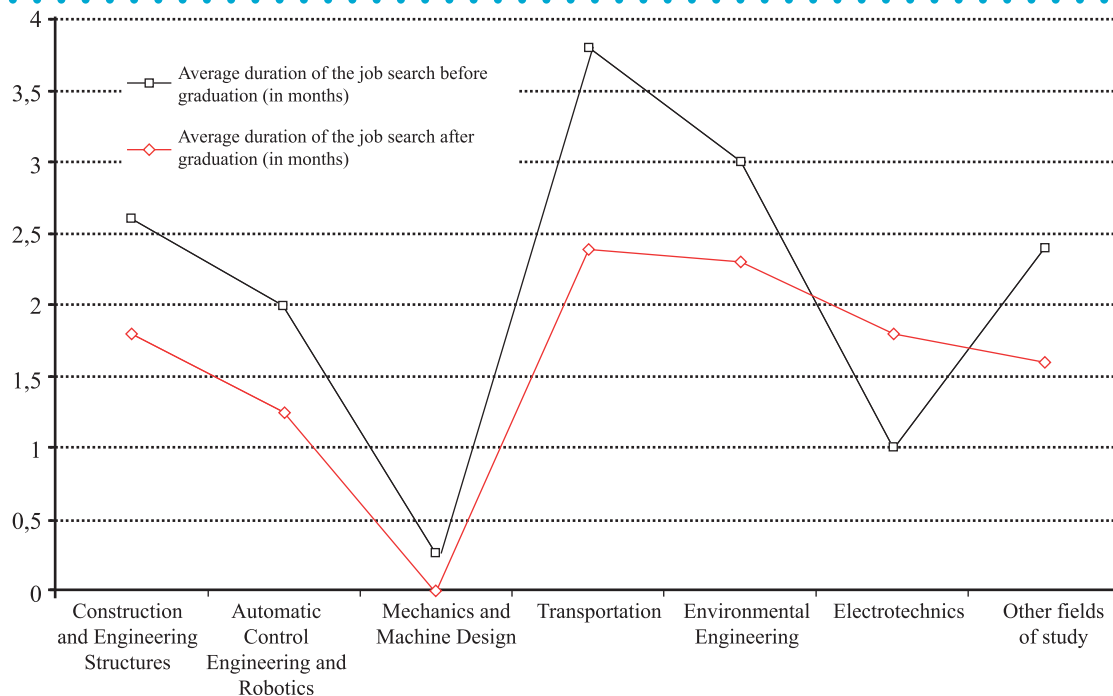


Figure 7. An average time for the first job search by graduates from the year of 2003

Source: author's calculations.



– Graduates are employed mainly by private SMEs (69%). Among employers, firms with international activities dominate (44%). As competition in the sectors where graduates are employed is considered to be strong and very strong (for 65% of firms), many of enterprises seek their competitive advantage in innovativeness of products, technologies and processes.

– Current occupation brings about a lot of job satisfaction for 78% of graduates, being employed on workplaces with high responsibility. For 94% of graduates, mistakes on the job have serious consequences for the firm. 55% of graduates are in top managerial positions at different levels (most frequently in firms with employment up to 10 persons), being responsible for supervision of other employees. 18% of graduates are responsible for strategic decisions of the firm (Figure 8). The highest level of self-reliance and independence in establishing personal goals and approaches for task performance is revealed by graduates from *Automatic Control Engineering and Robotics* and *Electrotechnics*.

– High level of utilization of acquired competences in their professional life is declared by 67% of graduates. Main mismatches between the competences of CUT graduates and employers include ability to work under pressure, ability

mobilize others for the task, effective time management, report presenting. Among competences not fully utilized on the workplace, IT knowledge and skills, ability of fast search of necessary information, knowledge of multiculturality, ability to communicate across cultural groups, fluency in foreign language are identified.

– According to 48% of graduates, from 3 to 5 years of work experience are needed in order to achieve appropriate level of qualification at the workplace. The fastest improvement in the level of professional knowledge is achieved by graduates from *Automatic Control Engineering and Robotics* — after three years, but for graduates from *Electrotechnics, Environment Engineering, Transport, Mechanics and Machine Design* necessary time span increases to 3,5–4 years, and for graduates from *Construction and Engineering Structures* up to 4,5 years.

– 38% of respondents declared monthly earnings at the level at least 4000 PLN (Figure 11). Graduates from *Automatic Control Engineering and Robotics* and *Construction and Engineering Structures* reported the highest wages at 4150 PLN;

– Over four weeks preceding the survey, 15% of respondents have undertaken attempts in order to change the job or have been waiting for the answers of earlier job applications.

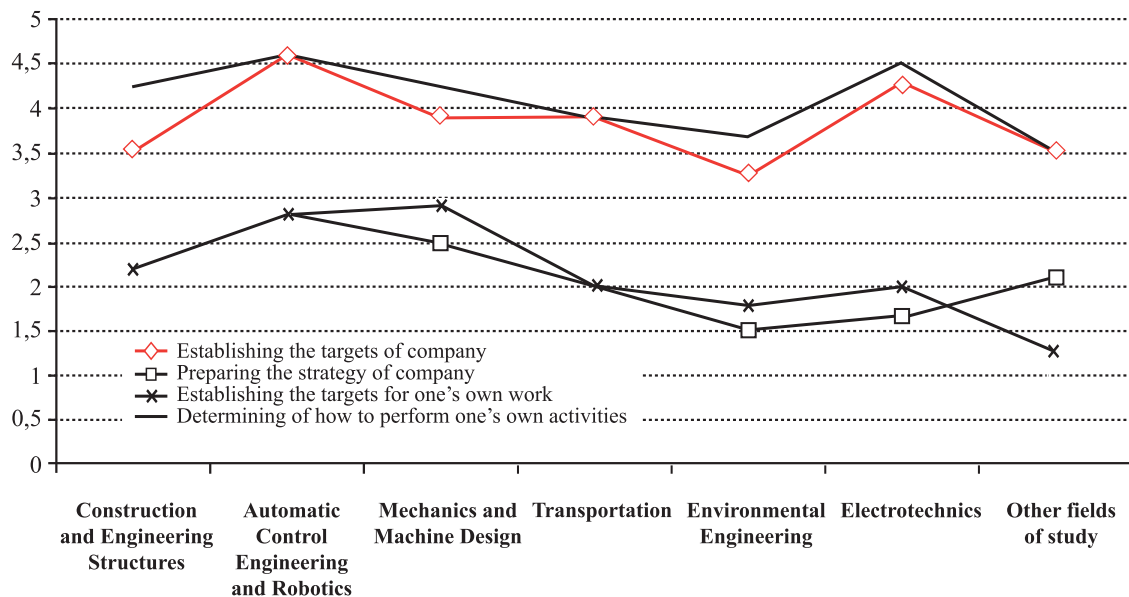


Figure 8. Opinion of graduates on the tasks performed at the current workplace (scale from 1 to 5, N=109)

Source: author's calculations.

# STRATEGIC DEVELOPMENT OF UNIVERSITIES

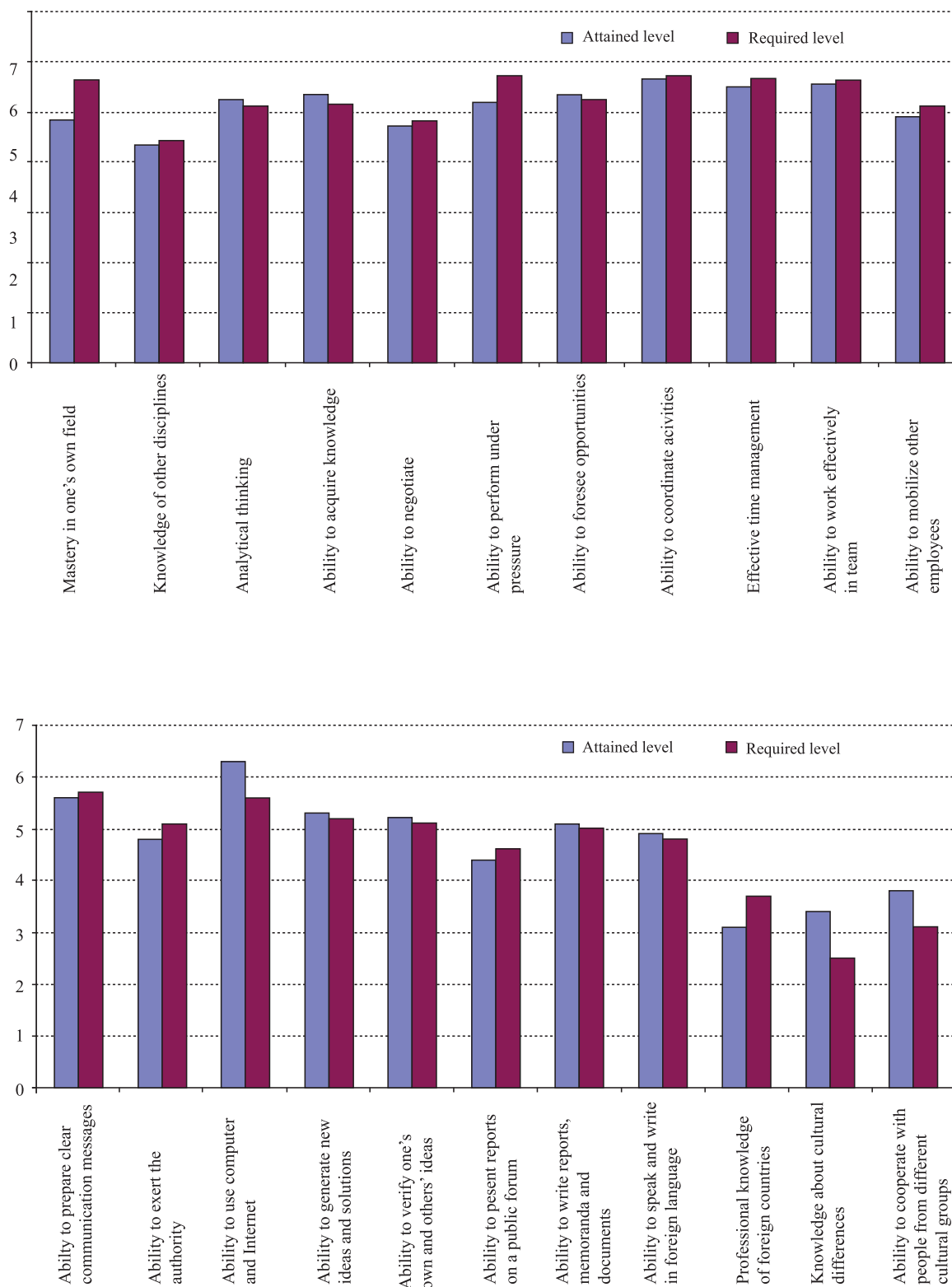
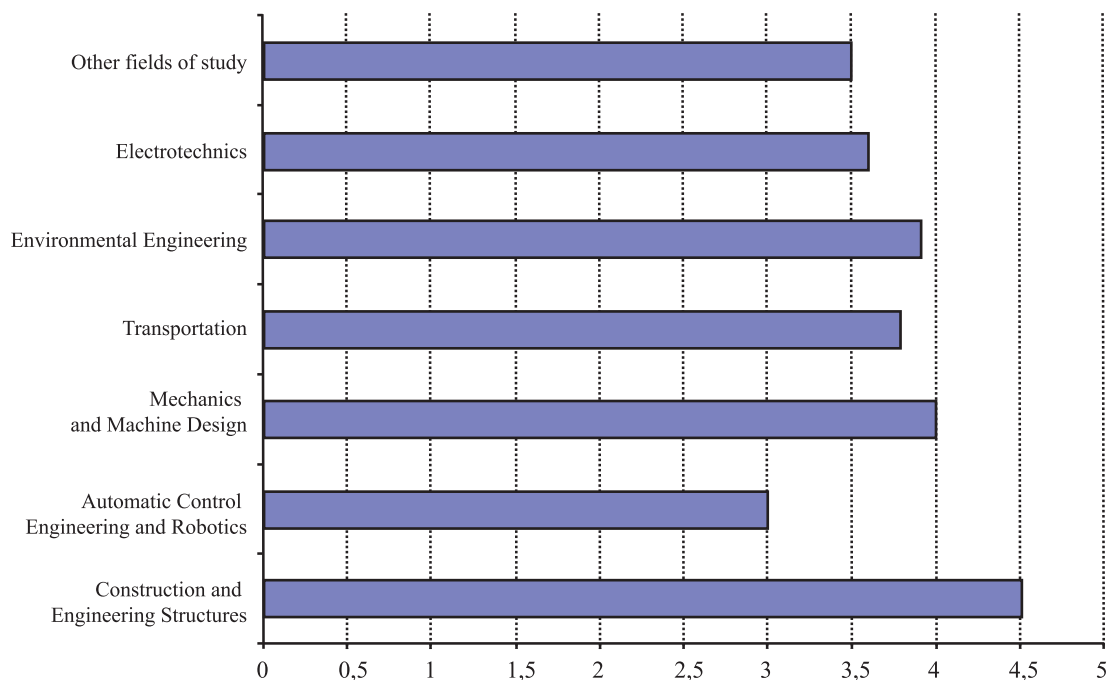


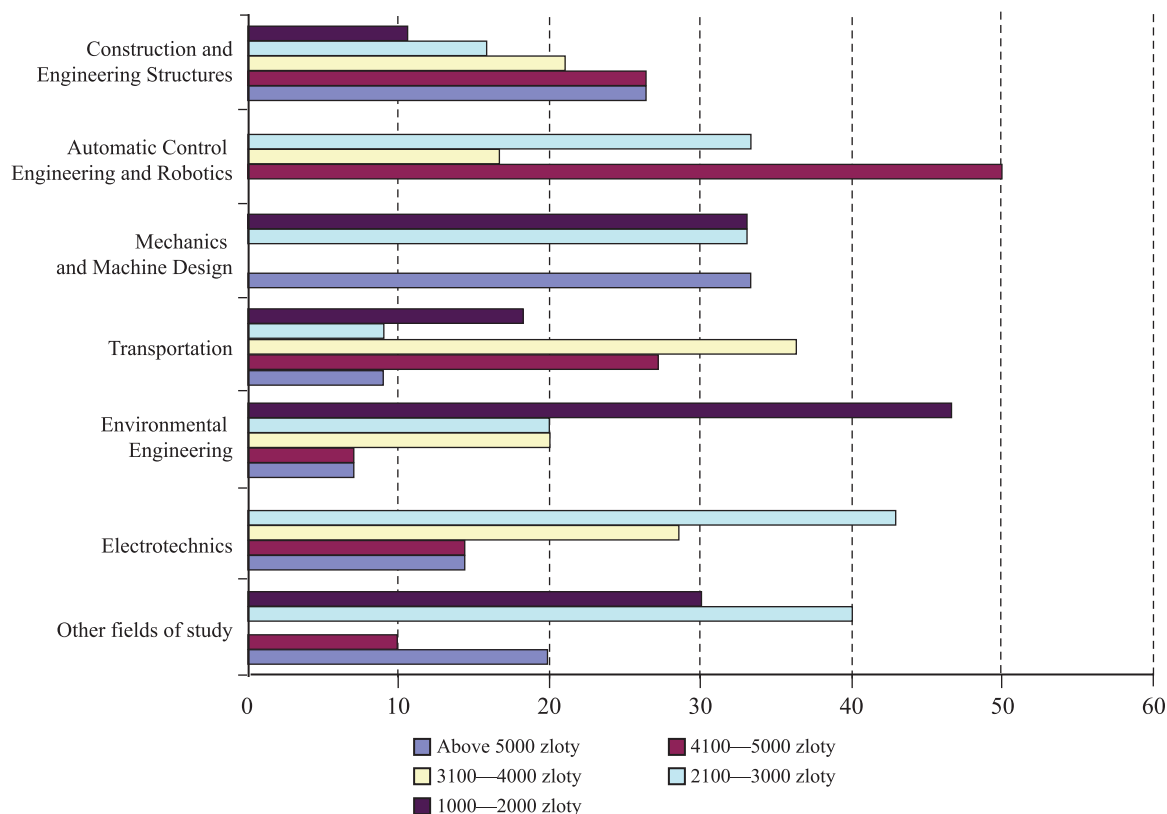
Figure 9. Structure of mismatch between acquired and utilized competences on the workplace for graduates from the year 2003 (scale from 1 to 7, N=109)

Source: author's calculations.



**Figure 10.** An average time span for achieving an appropriate level of qualification at the workplace according to graduates from the year of 2003 (in years)

Source: author's calculations.



**Figure 11.** Monthly earnings on the main workplace after five years from graduation in 2003

Source: author's calculations.

## Concluding remarks

As early as in 2006, CUT by its initiative on the monitoring of the career path of its graduates had preceded requirement of Article 13a of the Law on Higher Education from 2011 that «Higher education institution monitors the career path of its graduates in order to match fields of study and academic programs with the demand on labor market, in particular after three and five years from graduation.» As a consequence of the IESIF research activities, a lot of valuable information has been collected on the labor market requirements for specific competences, on the level of employers' satisfaction from the employment of CUT graduates, on the utilization during a job of competences acquired during academic studies, on the time span necessary to achieve a proper level of expert knowledge on the workplace, as well as about the level of graduates' satisfaction from their studies.

Results of our surveys are interpreted in many analytical dimensions — for departments, the fields of study, and for CUT on the whole. We identified the main obstacle for an effective monitoring of the career path for graduates (regardless of the length of work experience). It is lack of mandatory requirement for students to provide their mailing addresses, their actualisation and participation in surveys. Research activities on the career path for graduates require extra financing, which is a big problem under realities of the government belt-tightening fiscal policy. A favourable factor contributing to the effectiveness of research is acknowledgement of its numerous benefits for the higher education institution, students and employers. Data collected are used by the IESF staff for advanced studies on the scale and root causes of the mismatch between educational system and the labor market.