Research Article

THE VIEW OF THE TECHNICAL AND COMPUTER SCIENCE SPECIALIZATION IN THE SURVEY OF THEIR STUDENTS

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ABSTRACT

The article presents the results of the chosen research of Institute of Technology Students of Technical and Computer Science Specialization with use of questionnaire. For the research were chosen students from the last and the first year of study so that we can define the attitude to specialization and university of students who are finishing the study but also we can define expectations of people who had just begin their studies. Collected data were analyzed with the use of SPSS programme.

Keywords: motives of study, sources of information about studies, compliance with the faculty student's interests.

The study presents selected results of representative surveys conducted by Lublin University of Technology students from Technical and Computer Studies Education (TCSE) programme with a use of a questionnaire. The research group included graduating students in order to define their attitudes to the university programme they are completing as well as first-year students in order to recognise their expectations in this area. The questionnaires for both groups included 30 questions.

They covered such issues as:
- respondent's interests and preferences;
- former experience (job);
- factors that influence the decisions about the chosen programme;
- expectations and evaluation of academic teachers and university classes;
- attitudes towards professional job;
- level of satisfaction from the chosen university programme;
- demographics: sex, age, place of residence, high school, A-level subjects, siblings.

The questionnaire was composed of closed, half-open and open questions. It included also scaled questions and filtering questions with the access rule. Following the design of the questionnaire, pilot test was conducted in order to eliminate errors and inaccuracies in the questions. The survey was conducted among students in subsequent years from 2008 to 2012. The questionnaire was completed by 368 respondents from the first year and 316 respondents from the last year. The analysis was conducted with specialist software – SPSS.

Technical and Computer Studies Education enjoys good interest among students (Fig. 1). However, 5 years ago, in 2007 significant decrease of the number of candidates and accepted students were noted. The situation was probably caused by opening similar programmes at two other Lublin universities: University of Life Sciences and Catholic University of Lublin.

Considering lower number of accepted students the teaching programmes and programme schedule was planned to be changed, what allows the graduates to obtain the title of engineer. The realization of the teaching process was facilitated and information activities were intensified in the following manner:
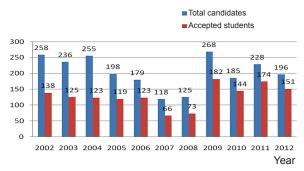
Fig. 1. The number of candidates and accepted students at Technical and Computer Studies Education programme in 2001–2012

- Internet (a movie about the Technical and Computer Studies Education, information service);
- meeting between vice-deans, university teachers, representatives of student association with high school students and teachers;
- distributing information leaflets, bulletins and posters by students competing their apprenticeship in schools and in their environments;
- advertisements in press, radio and television;
- publications and participation in scientific and teaching conferences.

The effects of these activities were noticed two years later – in 2009 when 182 students were accepted to the first year. It should be emphasised that the trend was maintained also in the present year with the number of first year students reaching 151 students. TCSE programme is the programme dominated by men, what is illustrated in Fig. 2. The highest number of women were accepted in 2001, i.e. 45 women, what made c.a. 33% of the total number of accepted students, whereas the lowest number of female students was accepted in 2003 and constituted as few as 10% of the total number.
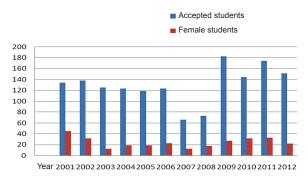

Fig. 2. Total number of students and female students accepted in Technical and Computer Studies Education in 2001–2012

Technical and Computer Studies Education programme is chosen by students of different ages, with different experience and preferences. The largest number of people who take up this programme are between 19 and 20 years of age and, as the survey among former students shows, they are graduates of both high schools and (49.7%) and vocational schools (46.1%). The research conducted among the youngest students from the first year show that the programme was most popular among people with a high school graduation certificate (84.6%) and only 13.2% with vocational school diploma – Fig. 3.
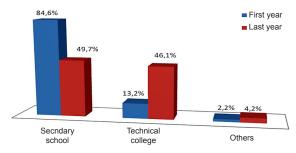

Fig. 3. The percentage share from first and last years of programme, with regards to the type of secondary school they finished

The survey shows that the most popular matura exam subject among future TCSE students is mathematics (first year students – 95.43%, last year students – 84.83%) and English (first year – 86.87, last year – 55.60%). Another subject popular among first years' students is geography – 18.2% (fig. 4).
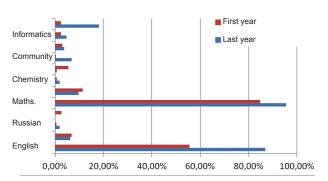

Fig. 4. Percentage share of subjects chosen for matura exam

First year students who started education in the presented programme in majority come from rural areas (45.2%). 25.5% of students come from large cities (population above 100 thousand). The above analysis suggests that the interest in TCSE is decreasing among students from large cities and is growing in the rural areas (Fig. 5).
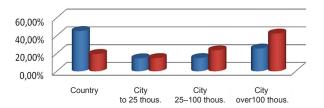
Fig. 5. The distribution of first- and last-year students with regards to their place of residence

78.7% of the students who started the programme declare that they were interested in the technique subjects even before. More than 68% of the group admit that they had already performed the activities presented in Fig. 6 such as: soldering, fixing a power point, assembling furniture, helping to fix a car, fixing a computer. The largest numbers of respondents have experience with assembling furniture (88%) and fixing a computer (84%).
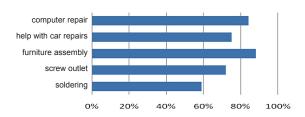

Fig. 6. The share of students with experience of doing simple technical operations

The interviewed students (42%) who have elder brothers or sisters obtained the information about the programme from their siblings. Those who do not have brothers or sisters use the Internet (39%) and University open days (8%) to obtain information about the studies (Fig. 7).
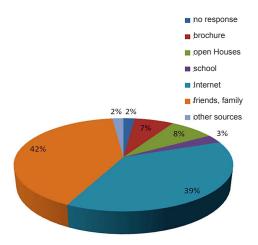

Fig. 7. The sources of information about Technical and Computer Studies Education

The interviewed had different motivations to start studying. First year students declared that they chose this programme because it is in line with their interests. Around 30% of the interviewed from both first and last year students chose the programme because they consider it easy to complete. They might have obtained this information from TCSE graduates. It is worth to note that only 9% of the respondents from the first year chose the programme because it prepares to work at school and a graduate obtains all the pedagogical qualifications. It should be emphasised that the share of students who are satisfied with this opportunity increases with each year of studies.
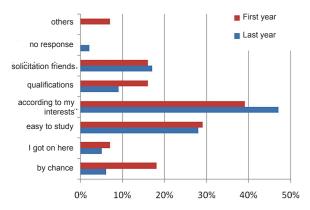

Fig. 8. The distribution of factors that influence students decisions to enrol for Technical and Computer Studies Education programme

First year students declare that they are interested the topics related to computer studies (46%). Significant numbers of students (37%) were also interested in technique as a field of knowledge (Fig. 9). The same students considered their interests while making decisions about their studies programme and pointed to Technical and Computer Studies Education as the programme that meets their preferences.
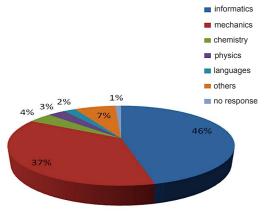

Fig. 9. Scientific disciplines that first year students are interested in

The survey showed that 97% of students did not have any problems with being accepted to Technical and Computer Studies Education. Only small number of candidates had problems with being accepted. They were the candidate who did not chose mathematics or physics as a *matura* exam subject. Over half of the interviewed students declare that within the last year of the programme they obtained a mark average above 4.0. The rest of respondents declare to have obtained an average mark above 3.0 or that they do not know their marks. Students were also asked if they receive scholarship for their results. 475 of the students did receive they. The survey shows that most female students receive scholarships for good exam results. The respondents from the first year were interviewed about the exam results that would be satisfactory for them. As Fig. 10 shows, over 60% of women and 30% of men would be satisfied with the average around 4.5. Unfortunately these are some students, c.a. 13%, who will be satisfied with the marks that are sufficient to be promoted to the next year of the programme.
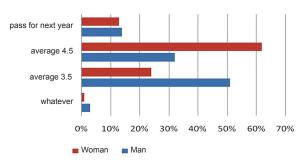

Fig. 10. The distribution of average marks satisfactory for first- and last-year students

Studying at Lublin University of Technology allows participating in various students' organizations. Unfortunately extracurricular activities were not popular among the interviewed students. Only 13% of the respondents took part in sports sections' meetings, a few people students danced in the folk dance group and a few more were active in students' unions. These additional activities are positively perceived by future employers. In their opinions, they teach scheduling works, give opportunities to be challenged in additional situations and are good preparation to professional job. Last year students defined what they want to do after finishing the studies. The answers are illustrated in Fig. 11. Only small number of respondents (15%) plan to work as teachers. Most of the interviewed, i.e. 33.2% prefer other occu-

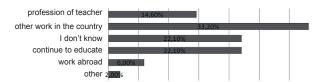pations in Poland. Many students have not made final decisions concerning their future careers.

Fig. 11. The jobs preferred by last-year students after graduation

The interviews show that more than 43% of the first and last-year students declare to be willing to work as an IT specialist (Fig. 12). Few students declare that they choose this programme to obtain pedagogical qualifications necessary to work as a teacher. Many of them (92%) consider the opportunity to obtain the qualifications as an important supplementary element that may be useful in the future. In their opinions these competences broaden their chances in the job market and constitute an additional motivator to study this programme.
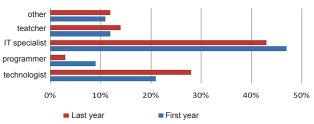

Fig. 12. The occupations desired by first- and last-year students

An academic teacher is a sort of mentor that prepares an adult to professional career. The job he does, contacts with students and the methods of teaching are crucial for the evaluation of the programme by the graduates. Thus, the academic teachers should do their jobs in the beast way they can and meet the requirement of both university authorities and students.

In the survey the interviewees were asked about the features of character of a good academic teacher. Students could tick three most significant traits. The result were presented in Fig. 12. They suggest that respondents from both the first and the last year consider the ability to pass on the knowledge and good contact with students as the most important skills. The third most frequent answer considered teacher's knowledge. In the two-option question about the teachers' features of character the most frequently ticked answers were that the teacher must be understanding for students and have good sense of humour.
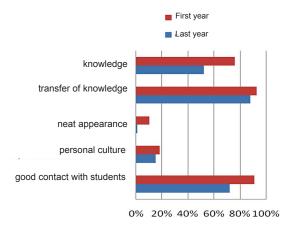
Fig. 13. Features of good teacher's character, according to first- and last-year students

Apart from the person of the teacher, the teaching methodology is of great importance. The respondents were asked about important elements of a good lecture. Students could choose two answers. The results were presented in Fig. 14. The survey shows that in order to gain students' interests they should use real life examples, present the information in a form of multimedia presentations and do shows and experiments.
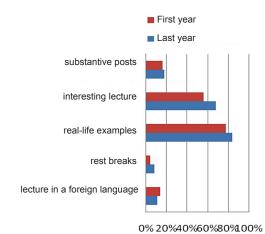

Fig. 14. The features of an interesting lecture

In the survey, the expectations from academic teachers were verified by average marks they were given by Technical and Computer Studies Education students. The respondents form the last year evaluated individual categories at the scale from 2 to 5 (Fig. 15). The highest rank, over 4 was given to the proposed category – easiness to obtain positive marks at tests and exams. Such an attitude to the fact does not necessarily bring notable benefits to future graduates but enjoys recognition from present students. The discussed programme can enjoy high marks in terms of good contact with students, appearance, and help-

fulness in writing diploma papers or the evaluation of teachers. It is worth to mention that all categories were marked higher than 3.8 and the average was 4.03.
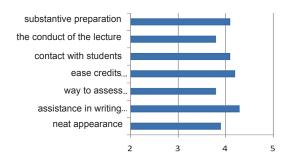

Fig. 15. Average marks given to Technical and Computer Studies Education teachers by last year students

The respondents from the first year were asked to evaluate the criteria concerning Technical and Computer Studies Education from the perspective of the first months of studying. The highest marks were given to colleagues from the programme (c.a. 4.78 in 1-5 scale). Other categories obtained lower marks, e.g. 4.3 for the lecture time table. Similar average mark was given to academic teachers' work. The lowest result was recorded for the university infrastructure (3.85). Students from the last year were also asked to evaluate the technical equipment of the programme. 76% of the students said that the technical background of the university is good but not always most modern. Only 8% of the students think that they are taught with very good and modern equipment. The interviewed made suggestions about the equipment that is needed in the department:

- new computers;
- new and modern research devices;
- numeric lathe;
- 3D printer;
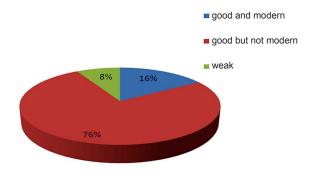- modern Internet cafe and faster wireless access to the Internet.

Fig. 16. Opinions about technical equipment available at university in the opinions of last-year students

In the framework of the programme students had to learn different subjects. Some of them were more difficult for the students, what is presented in fig. 17 (respondents could give 3 answers). Among the most difficult subjects students mentioned physics (78%), mathematics (48%), technical drawing (34%). The least problematic subjects included the ones that require manual skills (8%).
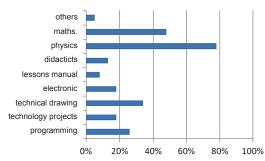

Fig. 17. The most difficult subjects, according to students

The programme of Technical and Computer Studies Education prepares both engineers and future teachers. Therefore, students were asked to evaluate in what extent they will use the knowledge as teachers. The answers suggest that c.a. 23% of the respondents claim that only a few subjects will be useful for them in their work at schools. 42% of the interviewees claim that most of the subjects are useful in 50%. Such a result may be interpreted in two ways. First, if the programme is aimed at preparing new teachers, the number of subjects that are useful for teaching should be higher; however, if the programme is to provide comprehensive knowledge, the obtained results are more optimistic.

In the survey there was also a question for first- and last-year students concerning the level of advancement of the knowledge on certain topics discussed in the framework of the programme. The analysis of Table 1 shows that the expectations towards the knowledge on specific subjects differ significantly form the marks given by TCSE graduates. In the scale from 0 – meant zero level of knowledge, 1 – a basic level, 2 – intermediate level, 3 – advanced level, the largest number of points were given to the subject related to preparing visual presentations. This subject has also the smallest differences between the expectations and the final marks (the was 0.29).

Students were also asked if they would make the same choice, from the perspective, and choose TCSE programme. The answers were diversified. 68% of the respondents would make the same decision but as many as 14% of the graduates would not make the same decision. Many students cannot decide whether the programme they are completing is/is not satisfying for their expectations.

CONCLUSION

As the results of the research show, Technical and Computer Studies Education at Lublin University of Technology meets students' expectations. One should also emphasise that the academic teachers who conduct their classes at TCSE are also highly appreciated among students (including their preparation and contacts with students). In the region there are many higher education schools, both private and public that offer a wide range of teaching programmes. It is certain that only those that meet students requirements to largest extent will be chosen. Therefore, each university and its programmes must face the challenge of adapting to the situation to be positively perceived in both higher education market and labour market. Graduates and employers positive opinions will certainly win the programme

Table 1. The comparison of expectations and performance concerning the subjects taught at Technical and Computer Studies Education

Subject	I year students' expectations (marks)	Graduating students' evaluation of specific subjects
Building WWW websites	2.14	1.72
Programming	2.16	1.22
Data base building	2.11	1.58
Building Internet networks	2.25	1.36
AutoCad	2.45	2.05
Creating multimedia presentations	2.84	2.55
Creating construction presentations	2.21	1.87

a horde of new candidates. The obtained results of the survey may be used to form a strategy that will adapt the offer of the programme to systemic requirements related to the implementation of the national framework of reference for qualifications and the requirements of the labour markets and potential students.

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