

THE IMPLEMENTATION OF PERSONALITY DEVELOPMENT AND SELF-KNOWLEDGE SUBJECTS IN ENGINEERING TRAINING IN DEBRECEN (Experience, opportunities, plans)

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Abstract: In order to determine the higher education institutions competitiveness it is essential to know that, the labor-market what opportunities insures for graduate students. The quality of engineering training, as well as the competence of engineering students will greatly influence the future. The competences that a trained employee needs to fulfil their professional duties can already be developed during education, a good method of which is education through projects. For both employers and graduate student the general knowledge, the learning ability, problem solving ability are the most important competencies. For improving the interpersonal competence the Faculty of Engineering of the Debrecen University implemented two elective subjects entitled "Self-Knowledge" and "Personality Development" in the academic year 2010/2011. This study shows the structures and characteristics of these two subjects.

1. PROFESSIONAL CONTEXT

The University of Debrecen is one of the most significant intellectual centres of the Northern Great Plain region. It boasts up to 30 000 students with an over 1500-strong teaching staff and 6000 other employees. The faculties of the University of Debrecen constitute three big organisational units. One of these is the Centre of Arts, Humanities and Sciences, to which the Faculty of Engineering belongs. Out of its 15 university faculties, the Faculty of Engineering is the third biggest, and it regularly co-operates with other faculties through cross-faculty teaching and joint grant applications.

In the education market, the demand for engineering training stagnated for nearly ten years, but after 2000 the teaching profile of the faculty was extended, and as a result, there was an increase in the number of students (Figure 1).

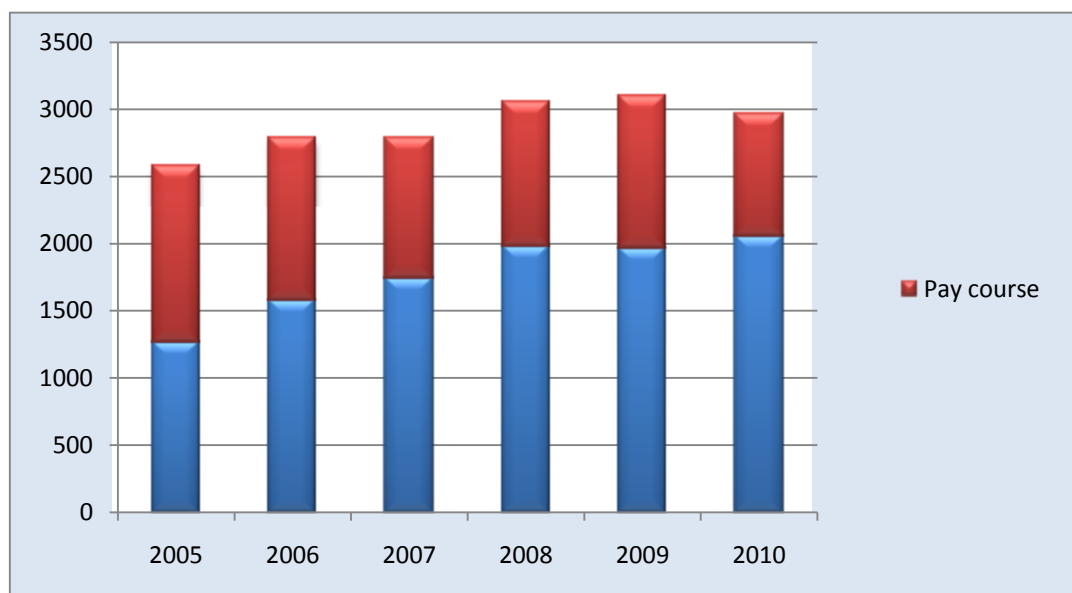


Figure 1. The number of students after 2000
(Source: author's survey)

A high proportion of students come from the Northern Great Plain region (Figure 2), but there are also students from the Southern Great Plain region. According to the schools'

own assessment, 75% of the students come from average secondary schools, 15% of them from excellent ones, and 10% from rather poor ones.

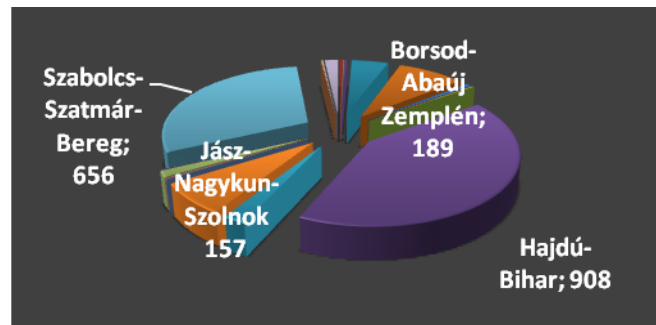


Figure 2. Distribution of the students from the country
 (Source: author's survey)

The region is a disadvantaged one within Hungary, the average salary can be said to be low and the rate of unemployment is high (Figure 3).

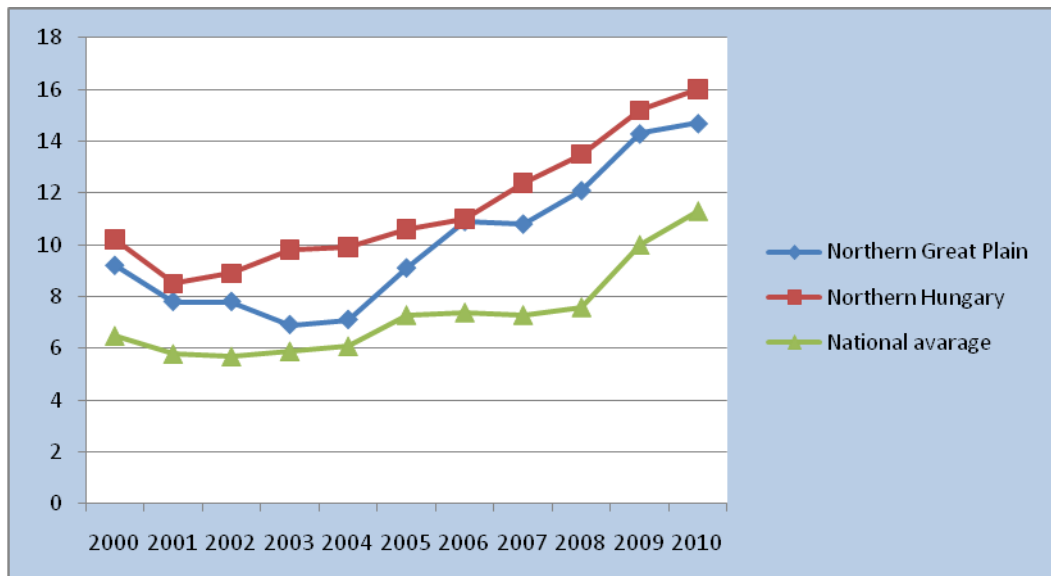


Figure 3. The average salary
 (Source: KSH)

Family circumstances are also less favourable in a national context. The number of single-parent families is high (in 2009 it was 64 545, the only region that had a higher rate was Central Hungary). In terms of annual per capita income in 2009, this region had the lowest figure (approximately 950 000 HUF), while the highest figure was that of Central Hungary with approximately 1 400 000 HUF. The Northern Great Plain region is the one that has the highest risk of poverty; demographic factors gained ground in generating inequalities and risks of impoverishment [9].

The faculty can estimate its own students' social status, mostly based on the applications for social benefits. Gifted students are encouraged with the help of institutional talent programmes, whereas disadvantaged students are entitled to certain social benefits from the faculty. The students' mental status is monitored by the recently founded Mental Health Centre of the University.

It is clear from the above-mentioned facts and figures that these students arrive in the Hungarian labour market from the most disadvantaged region. They are provided with the best possible opportunities to obtain the necessary professional knowledge, however, it is obvious that one needs to learn the skills needed to achieve success, such as the skill of self-assertion. An institution can provide as much knowledge as the student is willing to take, as much as s/he demands. Students need to be made aware that in order to succeed, it is not enough to be lucky, instead, they need to plan their career and discover their own skills. It is only this way that they will be able to do their jobs on a permanently high level and lead a balanced life.

1.1. THE DISTINCTIVE FEATURES OF LEARNING AND TEACHING IN ENGINEERING TRAINING

The quality of engineering training, as well as the competence of engineering students will greatly influence the future of both Hungary and the rest of the world, and people's quality of life in general (climate change, population growth, urbanisation, recycling). Engineering professionals of the future are expected to be highly competent and knowledgeable in their field, and also have qualities such as openness, the ability to co-operate, personal autonomy, good communication skills, language skills and the ability to adapt in a multicultural environment. Does the current education method enable students to acquire these skills? The competences that a trained employee needs to fulfil their professional duties [3] can already be developed during education, a good method of which is education through projects [1].

The dynamic growth in the number of students, however, led to a change in teachers' attitude to the process of education. These increased numbers and the more heterogeneous nature of student bodies have resulted in a different, more impersonal type of education. The emergence of mass education would require a greater proportion of individual work – outside the institution – from the students, yet their skills are not advanced enough, their motivation is poor, and their socio-cultural background is inadequate to do so. Bearing these facts in mind, it becomes clear why a student's academic evaluation is often not only based on their skills but also on their other circumstances.

In engineering training, just like in Hungarian higher education in general, a traditional, so-called Prussian education style is predominant, with teacher-fronted and knowledge-based teaching. This form of education is more efficient in homogeneous groups, whose pace of learning, way of thinking and level of knowledge are similar [6]. A disadvantage of this form of education is that it fails to take into consideration students' individual competences and skills. It is not interactive, therefore it cannot develop students' skills. However, today's labour market requires ever more practical skills from new university graduates, it is no longer sufficient to view education as a mere transmission of knowledge. The fast-changing lifestyles and cultural customs, to which students seem to be able to adapt effortlessly and superficially, actually strengthen the acquisition of adaptability skills and the presence of models that represent them. Competent professional knowledge and skills are easier to acquire through the so-called knowledge-creating education [5] (Figure 4.).

In engineering training, the psychological order of knowledge acquisition is of particular importance: perception, awareness, attention, remembering, imagination, thinking. In actual education, however, attention (in-class work) and remembering (tests) are mostly emphasized due to lack of time, human resources or equipment.

	Teacher-fronted education	Knowledge-creating education
Teacher	active knowledge, transmission of knowledge	developing skills, moderating
Student	passive, recipient	knowledge-creating, active participant
Curriculum	set (syllabus)	flexible, adaptable
Form of learning	reproduction, extension of knowledge	productive, problem-solving
Aim of learning	passing exams	practical use of knowledge

Figure 4. Comparison of two different education style
(Source: author's survey)

In order to change present-day teaching methods, UNESCO has set up a commission that aims to revise old-fashioned ways of teaching. The president of the commission is Jacques Delors, who was instrumental in summarising the requirements of 21st-century information society in an action plan called the Delors Report. According to the report, a pillar of education (especially basic engineering training) is the need for future students to learn how to work, and how to live with themselves and others. They must acquire the skills that enable them to be assertive, recognise their own strengths and weaknesses, and harmonise their personal autonomy with a feeling of responsibility towards their environment. As a result, they can become more conscious about the attainment of knowledge, and can be more responsible and efficient participants in the education process. Needless to say, in engineering higher education it is also important to face the changes regarding the “other side” of the classroom, i.e., the growing significance of schools and teachers as educators and role models. There have to be alternatives to the values presented in the media; other paths, opportunities and forms of learning. This means that, apart from research and education tasks, teachers of higher education have to deal with an ongoing self-training task as well.

It is due to the above-mentioned considerations as well as an obvious demand that the Faculty of Engineering implemented two elective subjects entitled “Self-Knowledge” and “Personality Development” in the academic year 2010/2011.

1.2. NEW OPPORTUNITIES IN METHODOLOGY

Owing to the nature of the learning material, the teacher-fronted education method is still desirable in engineering teaching. There are, however, certain methods whose introduction and extended use could lead to the better performance of both students and teachers [2].

The co-operative pedagogy and method means that there is group-work in the background of scientific work and performance. It develops the competences that are essential at multinational companies (such as conflict management, emotional intelligence, communication, decision-making, self-assertion). Co-operative group-work brings better results than those groups that strengthen individual values [7]. The spreading of co-operative methods, however, is hindered by social patterns, school hierarchy and the lack of co-operation among teachers [8]. The appearance of new creative workshops (Faculty of Engineering in Budapest, Csokonai Vitéz Mihály Teacher Training College in Kaposvár) has achieved success despite the difficulties of implementation. Such an opportunity is the creation and competition of “pneumobiles” at the Faculty of Engineering in Debrecen, where students complete their projects in groups.

Another new methodological opportunity is the method of projects, which has become quite widespread in engineering training. The method has been described by its founder, J. Dewey, in simple terms: “an ounce of experience is worth more than a ton of

theory.” Its key element is the idea that school should be life itself, based on reality, and the most important aim is to learn how to acquire new knowledge. This method primarily develops the skill of problem-solving and the strategies of decision-making. The implementation of activities connected to the world of work (school newspaper, laboratories, etc.) extend the opportunities of gaining experience at school. Such activities are of crucial importance as recently there has been a decrease in the above-mentioned opportunities.

Trainings and training methods provide students with practice that focuses on a given problem and a concerted effort of ways to solve it. Such methods are used by several companies in their training sessions and teamwork. At multinational organisations, employees are required to participate in various trainings during their workplace socialisation, such as psychodrama, development of conflict management and communication skills, team-building. The use of these methods has not become widespread in higher education. Large groups, time constraints, the diversity of interests, the lack of experienced teachers all hinder the implementation of this method. It is interesting to note that while most companies recognise and use the method of trainings as a form of education, in higher education institutions it has not become popular.

The subjects “Self-Knowledge” and “Personality Development” are taught with the techniques of this method. Within the framework of these subjects, students can also become acquainted with the significance of these techniques from a methodological point of view.

2. EVALUATION OF THE EXPERIENCES ON THE SUBJECTS “SELF-KNOWLEDGE TRAINING” AND “PERSONALITY DEVELOPMENT TRAINING” AND THE TRAINING METHOD

At the Faculty of Engineering in Debrecen, students first had the opportunity to take up the subjects entitled “Self-Knowledge Training” and “Personality Development Training” in the fall semester of the academic year 2010/2011. The two-hour sessions took place once a week, and later, due to the large number of students interested, the faculty decided to have two weekly courses on each subject.

The subjects were also available to students of engineering management, mechanical engineering, civil engineering and architecture. As a result of institutional co-operation, students of engineering information technology were also able to join the “Self-Knowledge Training”. In the fall semester of the academic year 2010/2011, the number of places available to students was 60 for the “Self-Knowledge Training” and 50 for the “Personality Development Training”, which was extended to 59 during course registration. In the spring semester of the same academic year, there was an increased interest in the subjects: 73 students signed up for the “Personality Development Training” and 51 students for the “Self-Knowledge Training”.

Correspondence students also had the chance to register for these courses. In the fall semester of the academic year 2010/2011, 22 of them signed up for the “Personality Development Training”, while in the spring semester 26 of them did so. The “Self-Knowledge Training” was available to correspondence students in the spring semester of the academic year 2010/2011, and 28 of them registered for it.

The training courses introduced by the Department of Engineering Management and Enterprise proved to be more popular than expected among students.

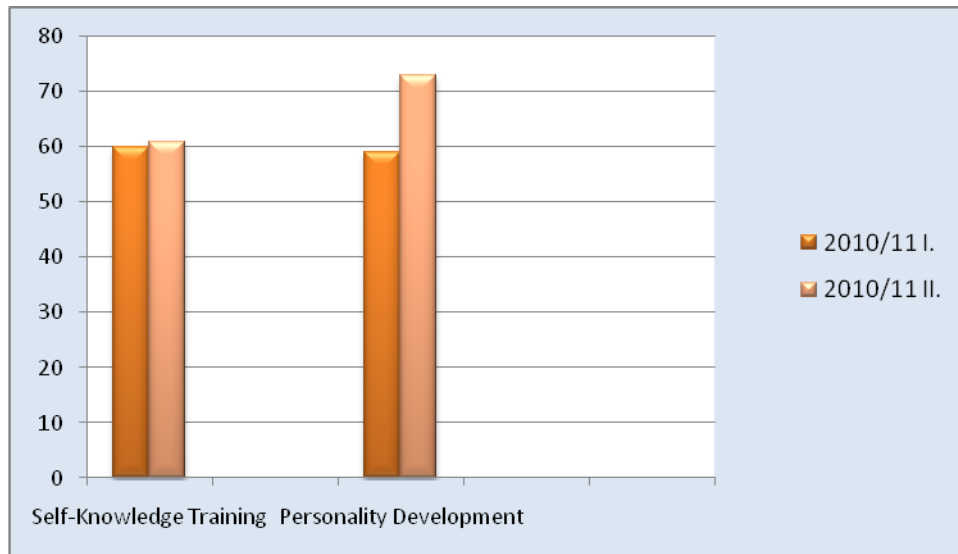


Figure 5. The number of students on the training program
(Source: author's survey)

2.1. STRUCTURE AND CHARACTERISTICS OF THE SUBJECT “SELF-KNOWLEDGE TRAINING”

The introduction of the course was due to the idea that students might need to learn about methods and ways to deepen or extend their self-knowledge. In terms of psychology, self-knowledge, or one getting to know one's own self is a psychological process during which – by focusing our attention on ourselves – we can explore our self, our opportunities and intentions, as well as our emotions and thoughts. We can understand the dynamism of all these, and also the roots of our motivations, and we can achieve self-acceptance. Self-knowledge helps us choose a career, develop social relationships, and enhance workplace integration. It is of special importance at a sensitive age, during one's years spent in higher education, when an individual's personality is exposed to countless new impressions and influences from peers, teachers and family. The self-knowledge thus gained and strengthened will influence our choice of job, integration and performance.

Self-knowledge trainings are mostly known as small-group techniques, therefore there was less of a chance to achieve real self-knowledge within the framework of school education. Instead, I concentrated on introducing ways to acquire self-knowledge techniques, and the opportunities that self-knowledge can provide. I used self-knowledge tests as well as other practical tasks that could be carried out in a classroom setting. With correspondence students, due to time constraints, we primarily completed and evaluated self-knowledge tests.

Course attendance was constantly high in the fall semester, and can also be said to be high in the spring semester (Figure 6), both in the case of correspondence and full-time students.

It is my experience that students – after some initial feelings of distrust – are ready to accept and share their opinions, thoughts and knowledge. The topics revolving around individual social problems (lack of self-confidence, peer issues, family problems) proved to be especially interesting to them.

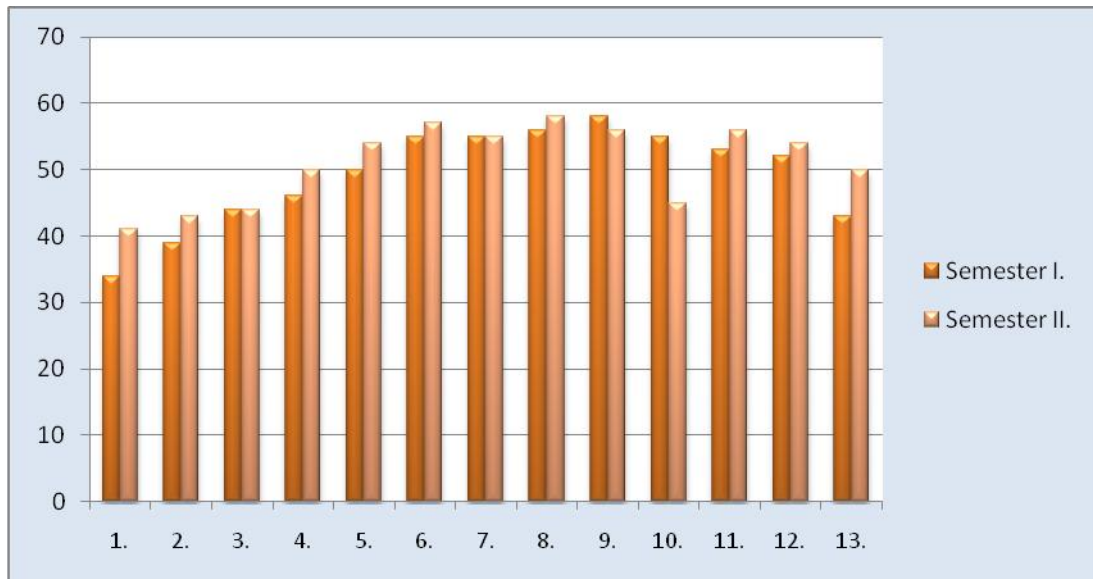


Figure 6. Number of students of "Self-Knowledge Training"
 (Source: author's survey)

2.2. STRUCTURE AND CHARACTERISTICS OF THE SUBJECT "PERSONALITY DEVELOPMENT"

Personality development is quite a fashionable term nowadays, and there are several trainings under this name. Within the framework of school education, I used this subject to acquaint students with personality as an internal set of conditions necessary to achieve success and a productive life. We primarily dealt with the internal peculiarities of personality, learning about its hidden resources, which students can use successfully in their social interactions. Only a personality capable of development will be able to lead a constructive life. The course materials were compiled to make students aware of the significance of this fact. The most successful course materials included the ones concerning job interviews, general appearance and the ways to achieve an autonomous life.

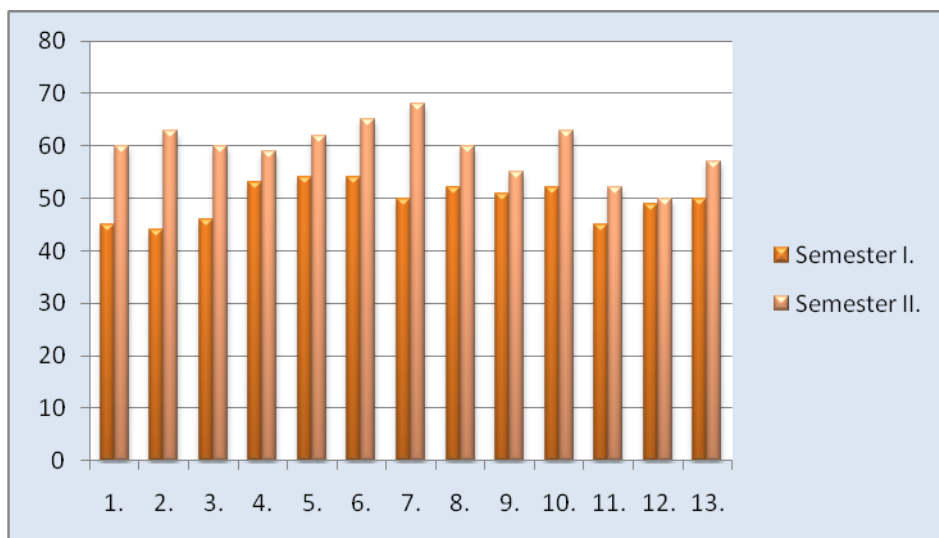


Figure 7. Number of students of "Personality Development"
 (Source: author's survey)

Course attendance was constantly high in both semesters (Figure 7), despite the fact that the classes were rather late (they started at 6 in the evening).

In my experience, this course is especially important for students. They have few role models in their environment or the whole of society to follow. It is often the case that they lack the proper motivation to set their own targets, instead, they have “dreams”. A crucial mission of this subject is to make students understand and accept that they can only achieve their goals if they are determined and work hard consistently.

2.3. PROPOSAL FOR THE IMPLEMENTATION OF A SUBJECT ENTITLED “ENGINEERING SKILLS AND PROFESSIONAL SOCIALISATION”

The subject is of module structure and mandatory for students of engineering in higher education. With the help of this subject, students have the chance to learn about the difficulties and joys of their chosen profession already at the beginning of their studies. They can learn the skills, characteristics and knowledge that they need to start their professional socialisation, enhancing their integration within the institution.

The proposed basic modules are the following: “Engineering Skills”, “Professional Knowledge”, “Communication” and “Methodology of Learning”.

The aim of the “Engineering Skills” module is to arouse and maintain students’ professional engineering interests and motivation. It is supposed to extend their knowledge and acquaint them with the skills to be developed. Furthermore, it should provide them with engineering insights, and integrate the cognitive schemata that are necessary for an engineering way of thinking to emerge.

The aim of the “Professional Knowledge” module is to make students view their education as a whole. It is supposed to make them understand what they need to learn and why, what requirements they need to fulfil. They are taught what knowledge needs to be acquired for each course specialisation.

The “Communication” module is primarily about enhancing the development of self-assertion and social competences within personality development. In this module students can learn about the role of co-operation, an assertive way of thinking, the significance of communication, techniques of conflict management and methods of effective decision-making.

The “Methodology of Learning” module aims to provide students with information that helps them to be conscious about their learning problems. In this module, students can find out about new learning methods and techniques, which can lead to better performance. Acquiring the skills of creating a learning plan and schedule enables students to achieve better results.

The subject wishes to develop students’ insufficient skills that are essential to good school performance. It is based on practice-oriented training and project methods. Students need to be aware and able to use certain social and intrapersonal competences in order to gain the necessary interest and professional knowledge in engineering.

3. SUMMARY

The development of general cognitive abilities and skills is not only important to the individual, but through the individual also to society. Students of engineering are often at a disadvantage in this area because of their field of interest. A further disadvantage could stem from their unfavourable family background and social situation that characterise the Northern Great Plain region (it has been stated at the beginning of the present article that the majority of students are from this region).

In the Human Resource Development Operational Programme of the National Development Plan, the priorities include the development of the skills required for life-long learning, as well as the development of entrepreneurial skills, adaptability and general professional motivation. Social and environmental awareness is a basic building block of the European Union's future society [4].

One of the major requirements of globalisation is the preservation of the personality's flexibility and openness. Engineering graduates, especially engineering managers typically find jobs at firms and corporations that favour such skills. The Faculty of Engineering in Debrecen believes in the importance of these skills, as these contribute to future engineering graduates' success in their professional lives, and turn these students into useful, effective and harmonious citizens who will benefit their own environment.

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