

ENGINEERING EDUCATION PROBLEMS IN STUDY PROGRAM AGRICULTURAL ENERGETIC

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Abstract. The main purpose of Agricultural energetic study program in Latvia University of Agriculture Faculty of Engineering is to prepare the specialists for small agricultural enterprises in electric and heat energetic. During the last years following problems became topical in connection with study process: the lack of motivation to study, the insufficient preliminary knowledge, shortage of conception about study process at all and about competences that is necessary to get after graduating the certain study program, a lot of students works, there are lack of study materials.

Key words: education, lifelong learning, engineer, agricultural energetic.

Introduction

The priorities of 21st century are education and society who learns. We are living in the age when good education has great importance to form a career. Demand grows on people, who are flexible, able to development, may adapt to variable conditions of environment and to promote their level of knowledge's.

Education defines the quality of life, attitudes to oneself, society and environment. There is stressed in the report of UNESCO international committee "Education for 21st century" that education has to be as map in complicated and changing world and compass that helps to find the right way at the same time. Education is continuous improvement process of knowledge's and skills, and fundamental tool for personality's development and formation of relation between persons, groups and nations [2].

Also continuous changes in society, economy and education creates embarrassment and unsafety in youths to make a choice in a life and labour market, goals for future are uncertain. Such problems are topical not only for high school graduates but also for those who enter in higher educational institution and recognize that their expecting is not conform with offer in selected study program.

Education has to deliver effectively and widely great amount of knowledge that continuously developing as well as skills, that are eligible to civilization ruled by knowledge, because it will be the base of skills that will be used in future [1].

It is possible to obtain Bachelor degree in energetic specialties in Latvia only in two universities: Latvia University of Agriculture (LUA) and Riga Technical University (RTU). The study programs in these universities have different objectives, content and aim.

The specialists, prepared in study program Agricultural Energetic in LUA Faculty of Engineering, are provided mostly for power supply and maintenance of electrical and heat equipment in small agricultural enterprises. Whereas RTU prepare specialists for so called big energetic, that are guided to big electric power and heat producers, the transmission and distribution of energy.

Analyzing distribution of students in LUA [4], it is cleared up, that the main part of them are coming from countryside – 68.8 %, the other ones from Riga – 10.3 % and other big cities – 20.9 %. Big part of part-time students work in stock company „Latvenergo” (the electric power producer and distributor in Latvia) subunits like distribution networks etc. That confirms the competitiveness of graduates in labour market also in the sphere of so called big energetic and the high evaluation of this study program between the employees and employers of energy enterprises. The advantages of LUA Agricultural energetic study program are wider spectrum of energetic branches incorporated in studies that includes the electrical and heat studies. As the result, graduates have better and more flexible possibilities in labour market, while the energetic study programs in other universities have more narrow specialization separately in electric or heat energetic.

The aim of research is to find out the problems that troubles successful studies of students of Agricultural Energetic specialty and to discover possible solutions for promotion of study process.

Methods

Cognitions from scientific literature, regulations, statistic data analyze from LUA are included in research. The conversations with full-time and part-time Agricultural energetic and Agricultural engineering students are carried out. The 208 respondents are questioned.

There are used also questionnaires worked out by special study process quality improvement working team, as well as the members of students self-government were involved.

Results

Analyzing the data from LUA Information centre [4], there is cleared up that every year on average 12.3 % from total amount of enrolment students are discharged from university. The situation with 1st Year students are given in Table 1. The similar number is in other Latvian universities – on average 12 % [3].

Table 1

Discharged full-time 1st Year students dynamics in LUA

	2003/04	2004/05	2005/06	2006/07	2007/08
Enrolled in 1st Year studies	2172	1917	1746	1159	1024
Discharged from the 1st Year (%)	279 (13)	180 (9)	224 (13)	337 (29)	181 (18)

The number of discharged part-time students is greater- on average 30 %.

The situation in study program „Agricultural energetic” in study year 2007/2008 is following: 5 % full-time and 16 % part-time students are discharged (Fig. 1).

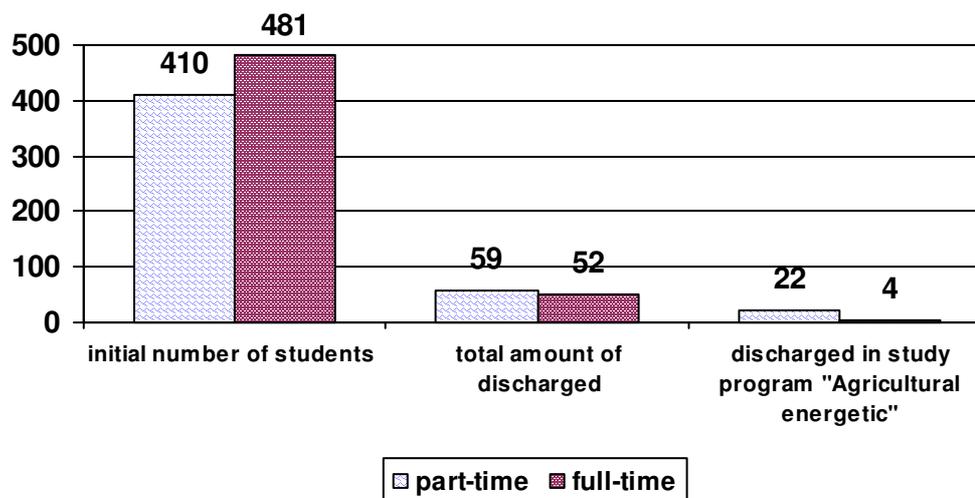


Fig. 1. The amount of discharged students in Faculty of Engineering (March 2008)

During discussion with students, who decide to interrupt studies, the main reasons are mentioned: inability to incorporate in study process, inability to combine studies and job, financial difficulties, good offer of occupation, the conditions in family and state of health.

Situation in higher educational institutions last years testifies study problems in first courses:

- students have a lack of study motivation and their skills to learn are incomplete;
- students have a lack of conception of whole study process and connection between different study subject;
- students haven't conception of required competences to complete study program;
- time isn't spending appropriately for promoting professional level (courses, seminars, meetings with professionals of industry);
- many students are working.

Motivation is one of the main conditions for successful learning. The man can do a lot of things if the action has clearly defined targets. Motive defines any action of man [5]. The Youth make choice to study due to different reasons: somebody looking for education, because he understands the role of education in his life, the other wants to study in certain speciality and after that to work in it, somebody complies with parents will or follows to his friends or that demands the employer.

On average 45 % of students said that they have chosen knowingly the studies in university and they connect chose speciality with their future or present job. The Youth choice is affected by popularity of speciality, the belonging to certain social group, financial possibilities, impact of parents and other factors.

Frequently students choose study program Agricultural energetic because some of their parents are working in this area (24 % full time students) or advance education was vocational in energetic field (19.7 %), such students are more motivate for successful studies. At part time studies most of all students are working in this field (Table 2), they have experience and also their further career opportunities are related with energetic.

Table 2

**The distribution of work branch for part-time students
in Agricultural energetic speciality**

Year	Number of students			Total
	Job is related to Energetic		Job isn't related to Energetic	
	Number	%		
1th year	17	66	9	26
2th year	18	75	6	24
3th year	10	100	0	10
4th year	9	90	1	10
5th year	18	95	1	19
Total	72	81	17	89

Mostly working becomes troublesome for student. Part time students can't combine studies with job because of load in their basic work (18 %), 23 % draw attention to unresponsiveness from employers.

One of the aims of questionnaire was to get information how to improve organization of study process. There were offered versions how to organize sessions for part time students. One variant was to replace existing two sessions (4 weeks each) in year to four sessions (2 weeks each) decreasing absence time from job during one session. Other variants: to plan contact lessons on weekends or on Mondays and Tuesdays; to establish distance education; to keep only practical and laboratory works instead of lectures; to apply in practice group seminars and consultations by e-learning; to practice lecturer's outside seminars.

Analyzing data of part time students' questionnaires there was found that 77 % of them are satisfied with current session time (4 weeks two times in the year). Irregular division of lessons in weekdays was mentioned as imperfection of study organization. But it can't be considered as a reason for unsuccessful studies.

For full time students widespread reason to leave studies is because of financial considerations. Students have to pay themselves for studies or their expenses not respond to parents resources. If students are low motivated, they easily can leave studies due to well paid job, they don't think about future. Government's definite scholarship is 70 Ls per month and approximately only 5 students in a course receive it. As observations testify it causes concurrence between students, which can't be seeing as mainspring. 14 % of students maintain that it prevents or even locks communication between course-mates. Of course students can apply to other scholarships or honours founded by companies or individuals. To get these scholarships it is not enough to study successfully, students have to make research and to show other achievements.

The reason of unsuccessful studies is also the incompleteness in preliminary knowledge. The existing free choice possibility between humanitarian and exact courses in the education system of

secondary schools creates problems in engineering education and in long term impacts the labour market and national economy. This free choice deforms labour market, because the state have to spend a lot of resources in the change of qualification of employees. Also it is very difficult for pupils to change the course from humanitarian to exact and vice versa [3].

The students have problems to acquire the basic subjects of engineer sciences like *Physics* and *Higher Mathematics*. Without the sufficient knowledge in these subjects, the students have great problems to acquire following theoretic subjects, for example *Thermodynamic*, *Fundamental Electrotechnics* etc. As result, the lecturer have to teach the elementary and also more difficult *Physic* and *Mathematic* basic laws, that normally he has not to do. The *Mathematic* and *Physic* often are not passed till the last study year and that impacts the acquirement quality of following study subjects.

Making questionnaire about the special study subjects the attention was draw to motivation of students to acquire given subject and preliminary knowledge. 23 part time 4th year students were inquired. Analyzing questionnaires about study subject *The design of heat supply systems*, there were obtained, that 16 students was not especially familiar with literature in this sphere and only part of them will make deeper their knowledge studying special literature after passing of subject. Unlike full time students, who make a choice of professional career between different spheres of energetic in last study years, the main part of part time students are involving with job in *Electrotechnics* branch (81 %) (Table 2). All of inquired students (100 %) recognize the information delivering in subject *The design of heat supply systems* as very good or good, but when lecturer evaluates the Course projects and test works, he finds knowledge of students as weak and superficial. It makes out the insufficient motivation.

A lot of students when find out the nonconformity of their interests, abilities, learning skills and conceptions with chosen study program, usually solve the problems with interrupting of studies. The nonconformity of aim with motive to study is essential problem; it is more difficult to study. Usually students hold a view, that part of study subjects included in study program are not related to speciality and therefore they are unnecessary. I. Žogla notes that not always obtained knowledge are useful at the moment, they can be usable only in the future and students not always recognize it [6]. Therefore lecturer have to promote the motivation of students by demonstrating the signification of given subject in the specific study program and by connecting the knowledge acquired in the subject with the necessary competence of nascent specialist in accordance with the requirements of labour market. Enterprises, where students practices and visits organized by lecturers to different enterprises as well as meetings with potential employers, give the view into practical side of speciality, also part of students find their job after graduating there.

Essential role in the study process is played by competence of teaching staff and their possibility to obtain the attention and interest of students in delivered topic. Therefore it is very important to improve the competence of lecturers in the practical sphere. The existing level of lecturers is high in theory and fundamentals, where changes are not so fast, but in practice the technologies develops very fast and lecturer must follow them continuously to obtain the respect from the audience as the competent specialist. This is especially important in work with part time students, who have great experience in the practical job and sometime if they are in leading positions also they have knowledge in modern technologies. The great importance to improve the competence of teaching staff is scientific and other projects. In year 2007 the project "The technological practice of teaching staff in energy enterprises" was realised in Institute of Agricultural energetic. Within the framework of this project all teaching staff of institute have two months long practice in enterprises that works in the energy sphere. There were made contracts with three enterprises: two of them in branch of electrical energetic, one in branch of heat energetic. During the practice, teaching staff visited energy producing and distribution objects and production units and got knowledge and skills in different technologies, calculation methods and qualifications were obtained. As result, the lecturers obtain practical experience that essential perfects their knowledge in theory with practical knowledge about up-to-date technologies and equipment. Similar projects were realized in other institutes of faculty. The regulation, that every lecturer must to acquire the course in didactic in size 160 hours, helps to improve the didactic competence of teaching staff. In the framework of this course the teaching staff acquires the knowledge about the up-to-date delivery methods and the developing of the highest education at all.

The students frequently mean, that there is not enough study materials, information sources in certain subject or it isn't accessible for everybody (especially in the countryside). Recently more and more lecturers place their study materials in the internet home page of faculty. It is very important for part time students, who have auditory lessons in range only one third in comparison with full time students. Thereby there is not possibility to expound all the material but only the most important tasks, what are difficult to find in literature, especially about new technologies and equipment. During inquiry there was cleared up that all students have computer and accessibility to internet. Thereby the role of study materials placed in home page is substantially increasing. The majority of students are using them. It is possible to divide materials in several groups: group of summaries of theory that perfects the lectures, group of methodology and guidelines for practical works and course projects, also the tasks for home work, group of materials for interactive study process, where it is possible to consult with lecturer, to send the solved home works etc. The last is still in developing phase and the importance of this will rise by developing of distance education.

Conclusions:

1. It is necessary to provide applicants to university with detailed information about the study programs, study subjects, studying and job facilities. It is necessary to support different activities of career guidance; they have to be based on evaluation of pupils' personality's strong and weak qualities, advancements, skills and interests. Student's motivation to chosen profession and related studies is very significant for the improvement of existing knowledge and development of new ones that leads to getting chosen profession.
2. The lecturers more widely have to use the possibilities of internet for placing teaching aids and for interactive study forms.
3. The organization of study sessions for part time students in general corresponds to possibilities of students to take part in sessions.
4. Teaching staff regularly must to practice, take part in seminars and workshops, in order to be able to deliver knowledge to students not only in classical theory, but also in the practical sphere at up-to-date level.
5. Training visits to different enterprises or practice in them, meetings with employers, graduates, the delivering of guest lecturers creates the connection between theory in university and real practical job.
6. There is necessary to develop the collaboration between LUA and the universities in other countries in relation to students and teaching staff exchange and good practice obtaining in the framework of respective programs.

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