

CHALLENGES WITH ENGINEERING EDUCATION FROM THE MARKETING PERSPECTIVE

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Abstract. The level of economic development in the country is significantly influenced by the availability of engineering specialists in the labour market. In the labour market of Latvia, the demand for engineers is satisfied only to the extent of 60-70 %. According to the Central Statistical Bureau data, the number of engineering students in Latvia represents 10 % of the total number of students, while in the European Union it is about 25 %. The fourth biggest university in Latvia (Latvia University of Agriculture) prepares engineering specialists in various fields – energy, construction, information technologies etc. But every year the number of students in engineering programmes is decreasing, which is affected by various factors, including the marketing activities implemented by the university. The aim of the research is to identify the problems of engineering education from the marketing perspective and to define the improvement opportunities. In the research paper, a case-study approach is implemented in order to analyse marketing-mix efforts of an engineering education provider, the Latvia University of Agriculture. The case-study approach was combined with a focus group of engineering students and alumni of the Latvia University of Agriculture and an analysis of a survey of potential students. The study shows that the price and quality of engineering programmes of the Latvia University of Agriculture (LUA) are competitive in the market. The main problems are connected with promotion. It can be concluded that there is a lack of information on the engineering programmes provided by the LUA, which is mainly affected by irregular marketing activities; the public image of the university does not seem attractive enough and does not reveal connection with engineering studies.

Keywords: engineering education, marketing mix, higher education.

Introduction

The current global environment can be described as a knowledge-based environment. Technology is becoming more and more embedded in the wellbeing, development, and competitiveness of any society [1]. This means that any country's economic development level could be considerably influenced by technological development and the availability of engineering professionals in the labour market because engineers have the knowledge and expertise to technically analyse problems and propose solutions for the accommodating needs of the increasing number of people and improving their living conditions. Engineers are at the forefront of making decisions that will have long-term implications for the planet [2]. It means that the industrial engineers who have obtained higher-level degrees play a decisive role as transmitters and introducers of progress [3].

In Latvia, however, the demand for engineers can be met to the extent of 60-70 %. According to the Central Statistical Bureau, the number of engineering students in Latvia represents 10 % of the total number of students, while in the European Union it is about 25 %. The fourth biggest university in Latvia (Latvia University of Agriculture) prepares engineering specialists in various fields – energy, construction, information technologies etc. But from year to year the number of students in engineering programmes is decreasing, which is affected by various factors, including the demographic situation. However, compared with the situation in other universities of Latvia that prepare engineering professionals, the number of students in engineering programmes in other universities even increase, which indicates that an essential role is played by marketing activities implemented by a university; this fact has been pointed by a number of scientists. L.Suhanyu (2011) states that in most cases, the competitive advantage does not lie only in a quality product or a great idea, but it is actually marketing and an optimal use of its tools that can on a decisive level decide about the success or failure of a product or service in the market [4]. There are authors who point out that higher education institutions should be marketed more and also managed more like corporate brands [5]. S.Whelan and M.Wohlfein (2006), F.Maringe and S.Carter (2007) state that university managers and academics have to consider the marketing not as an alien concept imported from the business world, but as both a viable philosophy and strategy for developing a higher education sector which meets the needs of home-based and international customers [6; 7]. It is quite a common occurrence that the quality of faculties and universities is not sufficiently expressed in their marketing and promotion [8]. However, the success and effectiveness of education providers depends on how

well their marketing and public relations efforts are implemented and understood [9]. Given the role of marketing in promoting education, including engineering education, the present research sets an aim: to identify the problems of engineering education from the marketing perspective and to define the improvement opportunities.

Materials and methods

In the paper, a case-study approach is implemented in order to analyse marketing-mix efforts of an engineering education provider, the Latvia University of Agriculture. The case-study approach was combined with a focus group and a survey analysis. The authors propose a qualitative research approach, through the focus-group method because this is very effective in determining the people's views, feelings and opinions [10]. The authors initiated a focus group consisting of four alumni and four engineering students of the Latvia University of Agriculture to gain the opinion on the acquired education (quality, professionalism, compliance with the labour market requirements etc.) at the university, to assess the image of it and study environment. A focus group discussion was held on 3 November 2015. The discussion took two hours and 40 minutes. Another focus group consisted of 10 potential students from different high schools of Latvia (Riga, Tukums, Rezekne, Jelgava, Kuldiga, Bauska, Sigulda), who are studying for the last year at the high school and in summer are planning to go to a university. This focus group discussion was held on 10 November 2015 and took three hours and 20 minutes. The focus groups were conducted to help design a questionnaire for a survey.

The questionnaire survey involved 517 respondents who filled in the questionnaires online. The respondents were the potential students and the existing ones from different universities in Latvia (42 % high school students, 22 % students from the University of Latvia, 14 % from the Riga Technical University, 8 % from the Latvia University of Agriculture, and 14 % – from other universities of Latvia). The survey period was from 30 November to 4 December 2015. The purpose of the questionnaire was to compare the supply of opportunities for studies at the largest universities of Latvia: the University of Latvia (UL), the Riga Technical University (RTU) and the Latvia University of Agriculture.

Results and discussion

The importance of marketing as a key for success even in the engineering education has been mentioned by S.A. Brown (1984) when he developed the model "Steps in Marketing Programmes" [11]. In his model, the marketing mix of a marketing strategy includes the "four Ps" factors – Product, Price, Promotion and Place – in educational programmes. According to P. Kotler, marketing mix is the set of controllable variables that the firm can use to influence the buyer's response [12; 13]. The recent political changes in the world and liberalization of trades have commodified education as a service [14]. This redefinition of the services opens up the market for education services to be exported as goods. The variation in cultural, societal, regulatory and economic aspects of the customers (students) of educational institutions makes it a big challenge for the market planners and managers to streamline the marketing efforts and find the right segment for the products they offer, the price they can offer, the channel they can use and develop the right promotional plan targeted towards the right segment of the customers. The whole marketing mix helps manage knowledge and supports corporate processes [15] and it holds an important place for actualising the marketing and positioning strategies [16].

Product. Present-day engineering education is an education in which the knowledge of basic science is applied to the efficient use of materials and forces of nature in order to meet the growing needs of humankind [3]. In the present research, engineering education is examined as a product offered in the market. If assessing the overall demand for engineering education as a product, according to the Central Statistical Bureau, one can find that in Latvia in the academic year 2015/2016 engineering students made up 15.6 % of the total number of students in universities and colleges, which was 2 % more than in the academic year 2005/2006. It indicates a positive trend in the demand for engineering education. However, the number of students at the Latvia University of Agriculture, which is one of the largest higher education institutions in Latvia with more than 150-year long experience, declines from year to year, particularly in engineering sciences. This indicates a decrease in the demand for the product, which might have several reasons.

According to the survey, the respondents regarded the Latvia University of Agriculture as less modern and prestigious than the other largest universities in Latvia (the University of Latvia and the Riga Technical University), which was one of the explanations why individuals preferred acquiring engineering education at the Riga Technical University. However, 52 % of the respondents noted the teaching quality as one of the characteristic features of the university as well as stressed its personal approach to a student (30 %) (Figure 1).

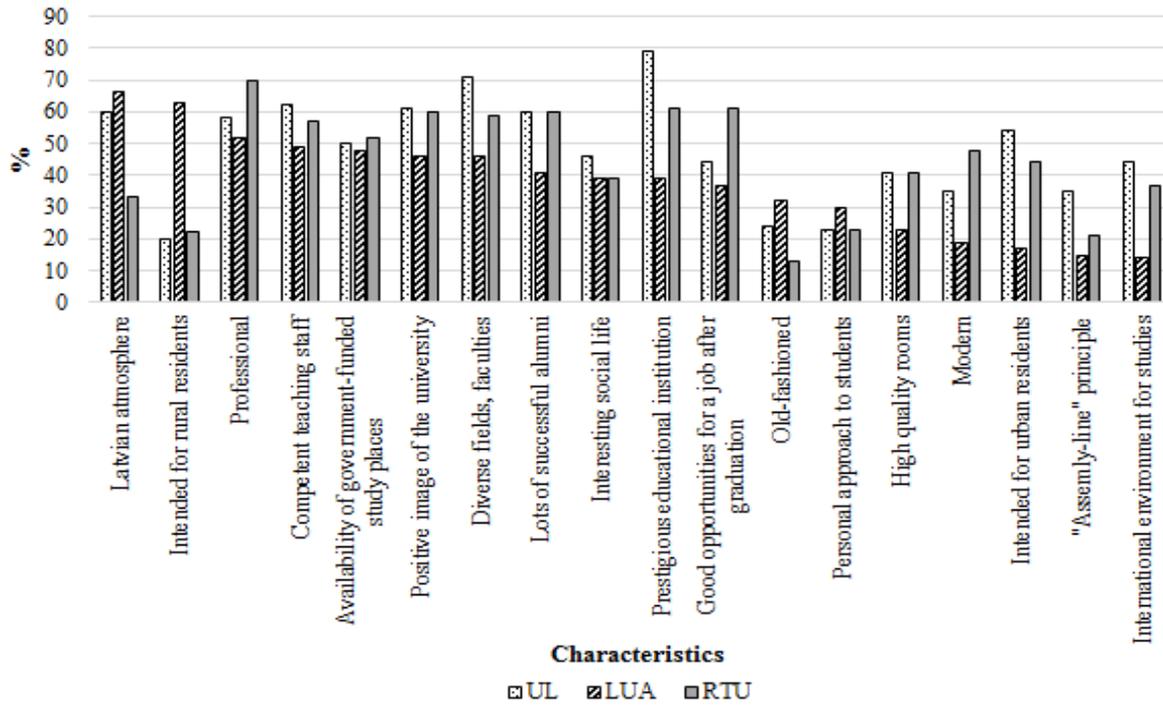


Fig. 1. Characteristics of the Latvia University of Agriculture compared to the University of Latvia and the Riga Technical University from the respondents' perspective

The participants of the focus group (alumni and the existing students) pointed that the education acquired at the Latvia University of Agriculture matched the labour market requirements and was of high quality. It points to the fact that the product produced by the university is of high quality and competitive in the labour market. Moreover, as regards the image of a higher education institution in society, the LUA was rated by the respondents, on average, at 7.33, which was slightly less than for the largest universities of Latvia (the University of Latvia was rated at 7.5 and the Riga Technical University at 7.4).

Price. The prices of similar engineering study programmes offered by the Latvia University of Agriculture and the Riga Technical University were compared to find out how competitive engineering studies at the Latvia University of Agriculture were in the terms of price (Table 1). The University of Latvia is not included in the comparison as it does not provide similar engineering study programmes.

According to Table 1, the prices of the LUA engineering study programmes were competitive with the offers of the Riga Technical University, and were even slightly lower. Given this fact, one can find that the difference in the tuition fees is not the determining factor for the choice of studies at the Riga Technical University.

Place. The Latvia University of Agriculture is a regional university located in Jelgava. In the geographic aspect, the LUA cannot compete with the universities located in the capital city (the University of Latvia, the Riga Technical University) in a direct way; yet, more than a third of the respondents (37 %) noted that they liked the location of the university. The participants of the focus group (the existing students and alumni) mentioned that Jelgava was a city of students, and student activities were typical for the city (the Students' Day, the Faculty's Day), as well as the local natural landscape was appreciated. Besides, Jelgava is located 50 km from the capital city of Riga. One can

conclude that geographically the Latvia University of Agriculture is competitive among the largest universities of Latvia, as it can attract students by means of the local natural landscape and its values and traditions.

Table 1

Tuition fees for bachelor study programmes in engineering per semester in the academic year 2014/2015 at the Latvia University of Agriculture and the Riga Technical University, EUR

Study programme		LUA		RTU	
LUA	RTU	Full time	Part time	Full time	Part time
Agricultural Engineering	-	870	590	-	-
Agricultural Power Engineering	Power and Electrical Engineering	870	590	900	800
	Heat Power and Thermal Engineering			900	700
Machine Design and Manufacturing	Engineering Technology, Mechanics and Mechanical Engineering	870	590	900	-
	Mechanical and Instrumental Engineering			900	700
	Transport Systems Engineering			900	-
Technical Expert	-	-	590	-	-
Computer Control and Computer Science	Computer Systems	700	-	900	-
Information Technologies for Sustainable Development	Information Technology	700	-	900	-
	Intelligent Robotic Systems			900	-
Construction	Civil Engineering	1010	-	1387.50	-
	Transportation Engineering			1387.50	-
Landscape Architecture and Planning	Architecture	1220	-	3250	-
Land Management	-	870	680	-	-
Environment and Water Management	Environmental science	870	-	900	-
Forest Science	-	900	-	-	-
Forest Engineering	-	900	600	-	-
Food Science	-	900	-	-	-
Food Technology	-	900	600	-	-

Promotion. In terms of unpromoted recognition, according to the survey, the Latvia University of Agriculture was ranked the 6th with a rate of 78 % (the recognition rate for the University of Latvia was the highest at 95 %, that for the Riga Technical University was 93 %); yet, the problem of promoted recognition revealed that only 10 % of the respondents did not know the Latvia University of Agriculture, while only 2 % were not aware of the University of Latvia. It means that on the whole the recognition rate of the LUA was very high. However, as regards the LUA faculties, the majority of

the respondents did not associate the university with engineering faculties (the recognition rate for the Faculty of Food Technology was 56 %, the Faculty of Engineering – 33 % and the Faculty of Information Technologies – 22 %), which indicated problems concerning marketing. As pointed by the focus group participants (potential students), the name of the LUA did not contribute to the recognition of engineering sciences at the university, as it created a one-sided view of opportunities for studies. The Latvia University of Agriculture was most often associated with agriculture and rural development rather than engineering sciences.

An analysis of marketing activities of the Latvia University of Agriculture leads to a conclusion that the university was advertised as a whole through various information channels. Advertisements were placed on television and radio, in printed regional newspapers, on billboards and websites (in social networks, social media; also articles on the largest news portals in Latvia etc.). The marketing focused on the potential students (schoolchildren) (the target audience aged 18-25) and their parents (aged 40+) – both Latvian and Russian speaking individuals –, therefore, diverse marketing channels were selected to effectively reach the target audience. The purpose of any advertising campaign is to inform the potential students about their opportunities for studies at the Latvia University of Agriculture and its services and government-funded study places, highlighting the university in the environment of media.

The marketing campaign conducted in 2015 may be considered to be successful, and the size of the target audience reached indicates it. However, although the marketing activities were diverse and contributed to the recognition of the university among the public, they did not focus on the recognition of engineering sciences at the Latvia University of Agriculture. In contrast, the Riga Technical University positioned itself as a place where to acquire quality qualifications of engineers; accordingly, the demand for its study programmes in engineering sciences was considerably greater than at the Latvia University of Agriculture. This indicates that a focused and targeted advertising campaign can provide higher results than a campaign oriented towards the recognition of the general image of a university. The authors suggest to popularise non-agricultural study programmes (study programmes in engineering sciences in particular) as well as to promote cooperation with general education schools by means of direct communication with the target audience.

Conclusions

1. The study programmes in engineering sciences offered by the Latvia University of Agriculture were rated as of high quality; yet, compared with the other universities of Latvia, the LUA was regarded as less modern and prestigious than the other largest universities in Latvia, which was one of the explanations why individuals preferred acquiring engineering education at the Riga Technical University.
2. Geographically, the Latvia University of Agriculture is competitive among the largest universities of Latvia, as it is located 50 km from the capital city and can attract students by means of the local natural landscape and its traditions and values.
3. The prices of the study programmes in engineering sciences offered by the Latvia University of Agriculture were lower than those at the Riga Technical University, which indicated that there were other reasons why young people chose to study engineering elsewhere.
4. The majority of the respondents did not associate the Latvia University of Agriculture with engineering studies, which was influenced by the name of the university and general marketing activities. A focused and targeted advertising campaign stressing the opportunities for studying engineering in particular has to be carried out at the Latvia University of Agriculture.

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