

STUDII ALE MANAGEMENTULUI INOVAȚIONAL: SPRE ÎMBUNĂȚIREA CALITĂȚII

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În 2013, ca rezultat al proiectului Dezvoltarea și implementarea programului de studii postuniversitare de management și tehnologii inovaționale, un nou program de studii postuniversitare a fost elaborat și lansat în Universitatea Klaipėda. Având în vedere că programul de studiu durează deja de un an, a fost adoptată o decizie pentru a evalua calitatea și de a identifica opiniile studenților cu privire la semnificația sarcinilor pentru șefii direcțiilor de cercetare și dezvoltare, așa cum este prevăzut în clasificarea internațională standard a ocupațiilor, precum și despre obiectivele și rezultatele învățării destinate programului de studiu. Obiectivul cercetării a fost de a evalua necesitatea studiilor de gestionare a inovării și calitatea punerii în aplicare a acestora, precum și pentru a identifica direcțiile de îmbunătățire a trainingului managementului inovațional. Pentru a justifica nevoia de manageri instruiți în cadrul programului de management inovațional și tehnologii, precum și competențele acestora, a fost efectuat un studiu pilot. Pentru a evalua calitatea studiilor, cercetare cantitativă a fost realizată prin intermediul unui sondaj structurat scris. Rezultatele cercetării au dovedit că programul de studiu a corespuns principalelor nevoi ale elevilor, precum și obiectivele și rezultatele învățării au fost importante și relevante pentru formarea managerilor de inovare. Calitatea programului de studiu poate fi îmbunătățită prin utilizarea activă a metodei studiului de caz, prin integrarea personalul companiilor de inovare în curriculumul programului de studiu, prin modificarea raportului dintre timpul alocat pentru studii teoretice și practice, precum și prin proiectarea orientărilor metodice specifice pentru scrierea tezei finale de Master în programul de studiu.

Cuvinte cheie: inovații, management, program de studii, calitatea studiilor.

Introduction. In 2012, GDP per capita in Lithuania amounted to 72% of that of the EU27 Member States. Lithuanian significantly lags behind the old EU member states by labour productivity. Poor labour productivity in the country results in relatively low wages. The national levels of unemployment (13,4% in 2012) and emigration [1] are rather high. To change the situation in Lithuania, technological progress is necessary due to which national economy would be able to produce more output by using the same amount of resources. However, to have a technological breakthrough in Lithuania, the level of innovativeness in it is insufficient.

The European Commission publishes an annual Innovation Union Scoreboard, based on 25 indicators related to research and innovations. The indicators are divided into 8 innovation dimensions. In the report of average scores of innovative activities in 2013[2].

INNOVATION MANAGEMENT STUDIES: TOWARDS QUALITY IMPROVEMENT

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In 2013, as a result of the project Development and Implementation of the Postgraduate Study Programme Innovation Management and Technologies, a new postgraduate study programme was developed and launched in Klaipėda University. Since the study programme has been running for a year now, a decision to evaluate its quality and to identify students' opinions about the significance of the tasks for the heads of the Research and Development Divisions, as laid out in the International Standard Classification of Occupations, as well as about the aims and the intended learning outcomes of the study programme, was taken. The objective of the survey was to evaluate the need for the studies of innovation management and the quality of their implementation, as well as to identify the directions of the innovation manager training improvement. To justify the need for managers trained in the Innovation Management and Technologies study programme, as well as their competences, a pilot survey was carried out. To evaluate the quality of the studies, quantitative research was conducted by means of a structured written survey. The outcomes of the research proved that the study programme met the main needs of the students, and its aims and the intended learning outcomes were important and relevant for the training of innovation managers. The quality of the study programme can, and is to, be improved by active use of the case study method, by integrating the staff of innovation companies into the curriculum of the study programme, by changing the ratio between the time allotted for theoretical and practical studies, and by designing specific methodical guidelines for the writing of the Master's final thesis in the present study programme.

Key words: innovation, management, study program, study quality.

JEL Classification: I21, O32

Lithuania was included in the group of moderate innovators: ranked 23rd, Lithuania was ahead of Poland, Latvia, Romania, and Bulgaria. Although the innovation rate in Lithuania is the fastest growing among the members of that group, it remains almost twice lower than the European average.

A survey of innovative activities of Lithuanian enterprises in accordance with the Eurostat's methodology and questionnaire is carried out by the Lithuanian Department of Statistics every two years. In accordance with the research data of 2010 to 2012, the number of innovative enterprises, in comparison with the period of 2008 to 2010, decreased by 2,5% and amounted to 30% of the total number of enterprises. The enterprises that carried out innovative activities employed 50,5% of the total staff in the enterprises.

The largest share of innovative enterprises was found in the fields of information and communications (60,4%) and finance and insurance (50,8%), while the smallest, in construction (18,7%) and transportation and storage (18,6%). In accordance with the research data, in 2012, the turnover of the innovative enterprises accounted for 63,4% of the total turnover of the enterprises. In the period of 2010 to 2012, 10,1% of all the enterprises introduced new products or services to the market [3].

To further improve the indicators of innovative activity in Lithuania, it is necessary to train respective human resources, i.e. innovation managers. The need for the specialists of innovation management can also be justified by the aspirations laid out in the Communiqué of the European Commission [4], i.e. to turn the common market into a growth and job creation platform and to promote competitiveness of different supply chain entities in the effective and fair common market of the retail and wholesale trade.

In 2013, the Faculty of Social Sciences of Klaipėda University launched a EU structural funds and the state budget of the Republic of Lithuania-funded project with the aim of developing, registering, and implementing a graduate study programme Innovation Management and Technologies[5]. The programme was successfully developed, launched, and has had 23 students since 2013. To improve the study programme, its quality analysis was carried out.

The aim of the research is to evaluate the need for the studies of innovation management and the quality of their implementation and to plan the directions of improvement in innovation manager training.

The research methodology

To justify the need for managers-graduates of the study programme Innovation Management and Technologies, as well as the provided competences, a pilot study was carried out. Its aim was to survey potential employers of the graduates from the study programme and to identify the need for employees and the key competences to be acquired during the studies. For the survey, a focus group method was chosen. For group discussions, such companies as JSC Mars Lietuva, JSC Švyturys Brewery, JSC Philip Morris Lietuva, JSC VPA Logistics, Klaipėda Science and Technologies Park, SC Western Shipyard, Science and Technologies Transfer Division of Klaipėda University, JSC Western Shipyard, SC ORLEN Lietuva, JSC NEO GROUP, JSC Mestila, and Association Baltijos slėnis were invited. The participants of the study were senior or top executives of different companies with different needs for the staff-graduates from the study programme Innovation Management and Technologies.

Another part of the study was the identification of the present master students' views on the aims and the learning outcomes of their study programme and the quality of studies. For that purpose, qualitative research was carried out, i.e. a structured questionnaire survey in writing. For the study, five structured questionnaires were used. The survey was anonymous and took place after the exam session of Semester 1.

The aim of Questionnaire 1 was to establish the quality of studies during Semester 1. In the survey questionnaire, students were asked to assess the content of each course, the lecturing, seminars, and independent work organisation, the general culture of the teacher, the required literature, the study materials, the objectivity of student assessment, teacher consultations, and the knowledge and skills acquired in the course.

In the development of the study programme and the formulation of its aims and the intended learning outcomes, the descriptor of profession 122304 Research and Development Managers of the International Standard Classification of Occupations (ISCO-08) was followed [6], in accordance with which research and development managers plan, direct, and coordinate the research and development activities of an enterprise or organization or of enterprises that provide related services to other enterprises and organizations. Therefore, Questionnaire 2 aimed to get students' opinion about the tasks assigned to the said qualification. The questionnaire included eight tasks for the head of the Research and Development Division that the master students were to rate on a five-point Likert scale.

In Questionnaire 3, the students were asked to evaluate the aims of the graduate study programme Innovation Management and Technologies, while in Questionnaire 4, to test the students' views on the aims of the study programme; they were asked to assess the learning outcomes of the study programme which related to the study aims and the courses.

By Questionnaire 5, in accordance with the indicators introduced in Questionnaire 1, the students' views on the courses taught in Semester 2 were identified.

The survey outcomes

The need for the staff and the staff competences

Group discussions with the prospective employers of the programme graduates revealed fairly high staff turnover in the enterprises related to a shortage of the necessary innovative knowledge. Due to that, the assigned tasks were performed in a non-quality way or not on time, and stressful situations arose. The greatest need for the specialists in the said field was felt when the global and national research achievements were introduced to business.

All the respondents noted that the need for qualified specialists of innovation management and technologies was especially relevant in large companies and depended on the type of its activity. The representatives of the surveyed organisations emphasised the necessity of interdisciplinary management and engineering studies.

The views of the organisation representatives on the necessary competences of the specialists in question differed. Almost all of them emphasised the need for the abilities of application and patent processing, innovation planning and implementation, and advising of the SME staff on the issues of innovation, as well as the skills of group work and foreign languages. A significant number of the respondents accentuated that the said specialists ought to be knowledgeable about the issues of patentology, intellectual property, and innovation inculcation in production.

As stressed by all the respondents, the graduates of that type were to have independent practical skills, as an innovation manager was expected to be able:

- to find innovation creators and researchers and to help them implement their new ideas;
- on the basis of the legal acts in force and economic rules, to help attract the investments necessary for the implementation of innovative projects;
- to manage innovative projects throughout all their life cycles.

Upon the evaluation of the survey data, it was established that those awarded the master's degree on the completion of the study programme Innovation Management and Technologies shall possess:

- **functional competences**; they shall be able: to assess innovations and technologies of different fields; to apply theoretical knowledge and research data to the development and implementation of innovative activity strategies; to do an analysis of the production process (technologies) and to submit proposals for the improvement of the technological process; to independently design the innovative activity of an organisation and to assess the outcomes of the design; and to work in high-tech industry organisations, business enterprises, research and government institutions, and multidisciplinary designer teams;

- **cognitive competences**; they shall be able: to apply exhaustive theoretical knowledge of innovation management and technologies, based on the outcomes of the latest fundamental and applied research, to their activity; to apply the latest theoretical knowledge, created by the (fundamental and applied) research in innovation management and technologies, to the solution of the raised problems under the conditions of uncertainty; and to deepen and extend the knowledge of innovation management and technologies (to extend cognitive competences) by independent learning and upon assessing the outcomes of one's own activities

- **generic competences**; they shall: possess the abilities of analytical thinking and problem solution, independence, the ability to concentrate, and the skills of communication and team work; be able to communicate and collaborate with specialists of other fields and to critically assess the outcomes of their own activity; have generic competences allowing to adapt to ongoing changes; be able to search for information and use information technologies; and they shall be able to, orally and in writing, justify and convey different research outcomes to industrial and service enterprises and to substantiate business management decisions.

The learning outcomes of the study programme Innovation Management and Technologies were formulated, given the specificity of the studies and the field of activity, as defined in the name of the study programme. Moreover, the global current issues in the field were taken into account, as well as their requirements set for the professionals: sustainable development under globalisation. The said issues through the learning outcomes of the study programme make an impact on the total didactic system of the programme: the

methods of studies and assessment, the courses and their interrelations, and the relations with other courses.

With respect to the survey data, Dublin Descriptor, and the Law on Higher Education of the Republic of Lithuania, the programme is oriented towards the aims of the second cycle study programme and Level 7 of the European Qualifications Framework, based on the learning achievement reference levels. The principal aim of the study programme Innovation Management and Technologies is to train qualified specialists of innovation management who would know and be able to apply research methods, to manage innovation processes, to find financial resources and outlets for new products, to guarantee their legal protection, and to take other innovation management decisions [7].

The graduates of the study programme shall be able to act as intermediaries between research and business, to plan, organise, and monitor the processes of research and experimental development, and to inculcate its outcomes in different organisations.

Master students' views on the studies

In accordance with the International Standard Classification of Occupations (ISCO-08), research and development managers' tasks include [6]:

1. planning, directing, and coordinating research and development activities, in-house or commissioned from external research organizations; developing new or improved technical processes, products, knowledge, or utilization of materials;
2. planning the overall research and development programme of an enterprise or organization, specifying goals and budgetary requirements;
3. leading and managing the activities of research and staff development;
4. establishing and managing budgets, controlling expenditure, and ensuring the efficient use of resources;
5. establishing and directing operational and administrative procedures;
6. planning and directing daily operations;
7. overseeing the selection, training, and performance of staff;
8. representing the enterprise or organization in conventions, seminars, and conferences.

The views of the master students on the tasks specified in the Classification of Occupations were identified by means of Questionnaire 2, described in the part of the research methodology. The survey data are presented in Table 1.

Table 1

The significance of the Classifier of Occupations-defined tasks, as assessed by the respondents

	Task No.								Mean
	1	2	3	4	5	6	7	8	
Master students' assessments of the task significance in relative units	77	74	78	62	56	51	54	63	-
Assessment of significance (mean)*	1,47	1,65	1,41	2,35	2,71	3,00	2,82	2,29	2,21
Standard deviation	0,800	0,931	0,618	0,996	1,312	1,173	1,015	1,047	0,987

* the smaller the mean, the more significant the task.

As can be seen from the presented data, the greatest significance should be attached to the training for the performance of the first three tasks. In the master students' opinion, manager of innovations should pay more attention to the research and development activities in organisations, to the research and development plans in organisations, and to the need for the budget, as well as to manage the activity of the research and technological development staff.

The survey outcomes also prove that, in the respondents' opinion, the least significant tasks of innovation managers include the establishment and management of operations and administrative procedures, the planning and management of everyday routines, and the supervision of the staff selection, training, and activity outcomes.

The significance of the tasks, as defined by the Classifier of Occupations, is proved by the data in Table 1. The mean of the significance of the first three task performance exceeds the total mean. In the students' opinion, the least significant task of an innovation manager is the planning and running of everyday activities.

The standard deviation presented in the Table indicates the dispersion of the research outcomes.

The main aim of the study programme Innovation Management and Technologies is related to the priorities laid out in the EU strategy for 2020, oriented towards the knowledge and innovation-based economic development and inclusive growth through the promotion of the high employment economy delivering social and territorial cohesion [8]; to Klaipėda University mission (a research, arts, and study centre of Lithuania as a maritime state and the Baltic Region that trains highly qualified specialists and fosters humanistic values) and to the strategic aim of KU Strategic Plan for 2012-2020, which provides for the development of the research and studies of the humanities and social sciences, as well as the fostering of artistic creativity and arts studies, therefore, the study programme is integrated into the common process of the university study and research. The aims of the study programme, the intended learning outcomes, and their relations with the courses of the studies [10] are presented in Table 2.

Table 2

**The aims and the intended learning outcomes of the study programme
*Innovation Management and Technologies***

The programme aims	The intended learning outcomes
1. The knowledge of the outcomes of the fundamental and applied research in innovation management and the latest studies based on the ability to apply them to problem solution in a new business environment, in conducting research, and in inculcating innovations.	a) The knowledge of the outcomes of the fundamental and applied research in innovation management, the ability to systematically and creatively apply them to research and to the decisions of a business enterprise of innovation creation and inculcation.
	b) The knowledge of the latest studies on market research and economic assessment of innovations and the ability to apply them to research conducting, new product development, and innovation inculcation in business.
	c) The knowledge of research novelties, innovations, and the latest contemporary technologies, as well as the opportunities of their application to research and the process of a new product development.
	d) The knowledge of the legal protection of intellectual property and innovations, as well as the latest theories and methods of patentology, and the ability to apply them to the creation and inculcation of innovations.
2. The ability to conduct research in innovation management, to use information technologies, systems, and databases, to critically think and analyse innovation-related problems and to make decisions, and to acquire communication abilities.	e) The ability to formulate research problems in innovation management, to choose or to design a research methodology, and to conduct independent research.
	f) The ability to analyse and synthesise the data of the research in innovation management, necessary for research and practical activities, and to use information systems and databases.
	g) The ability to orally and in writing justify the research outcomes and to substantiate the decisions in innovation management by integrating the outcomes of the research in innovations and other fields.
3. The ability to apply the possessed knowledge and, on its basis, to develop new measures of innovation management, necessary for research and the creation and inculcation of innovations.	h) The ability to analyse the business environment, to choose resources, the business venue, and the market, to critically assess the received information, and to apply methods and tools of business analysis to the creation and inculcation of innovations.
	i) The ability to conduct market surveys, to apply the outcomes of market surveys by choosing the price of the product and the wage system and by assessing the risk and profitability of the planned investment.
	j) The ability to evaluate the directions of the research and technological development, the advantages of the use of cleaner technologies, and the opportunities of sustainable energy and other contemporary production technologies for the creation and inculcation of innovations.
	k) The ability to protect the created intellectual property, to evaluate the benefits of innovation patenting, and to use the tools and techniques of licence trade.

4. The ability to convincingly convey the novelty to others, to organise the activity of a creative group, and to take responsibility for one's own and subordinates' activity outcomes; to find ways and means to improve them.	l) The ability to clearly communicate orally and in writing, to convincingly convey summarised information about innovations to specialists and users, and to critically assess it.
	m) The ability to work in an innovation-creating team, to organise personal and group activity, and to take responsibility for the quality of one's own and subordinates' activity and its assessment on the basis of professional ethics and public spirit.
	n) The ability to find tools and techniques to improve the activity of the subordinate staff and to increase their creativity.
5. To be able to independently improve the professional qualification of innovation management, to use the research experience for professional and research activities, and to take decisions on innovation management.	o) The ability to identify one's own learning needs and to learn independently, seeking to professionally develop in the context of lifelong learning.
	p) The ability to use the research knowledge, research experience, and the skills of innovative thinking for independent professional and research activity.
	q) The ability to take innovative business management decisions by assessing their ethics and potential impact on society and environment.

To assess the master students' views on the aims and the learning outcomes of the study programme, two questionnaires (3 and 4) were used. The aims of the study programme, presented in Table 2, were assessed by the students on a five point scale, with 1 meaning 'very significant' and 5, 'totally insignificant'. All the five aims of the study programme got very high grades from the respondents, from 1, 25 to 1, 5.

Despite a small difference between the calculated means of the student-presented assessment, one can see that aim 2 of the study programme was considered to be the most significant for the respondents, and, as the standard deviation for that meaning was the smallest, one can say that in that case the students' opinion was unanimous and significant.

The picture presents the students' views on the learning outcomes in means [11].

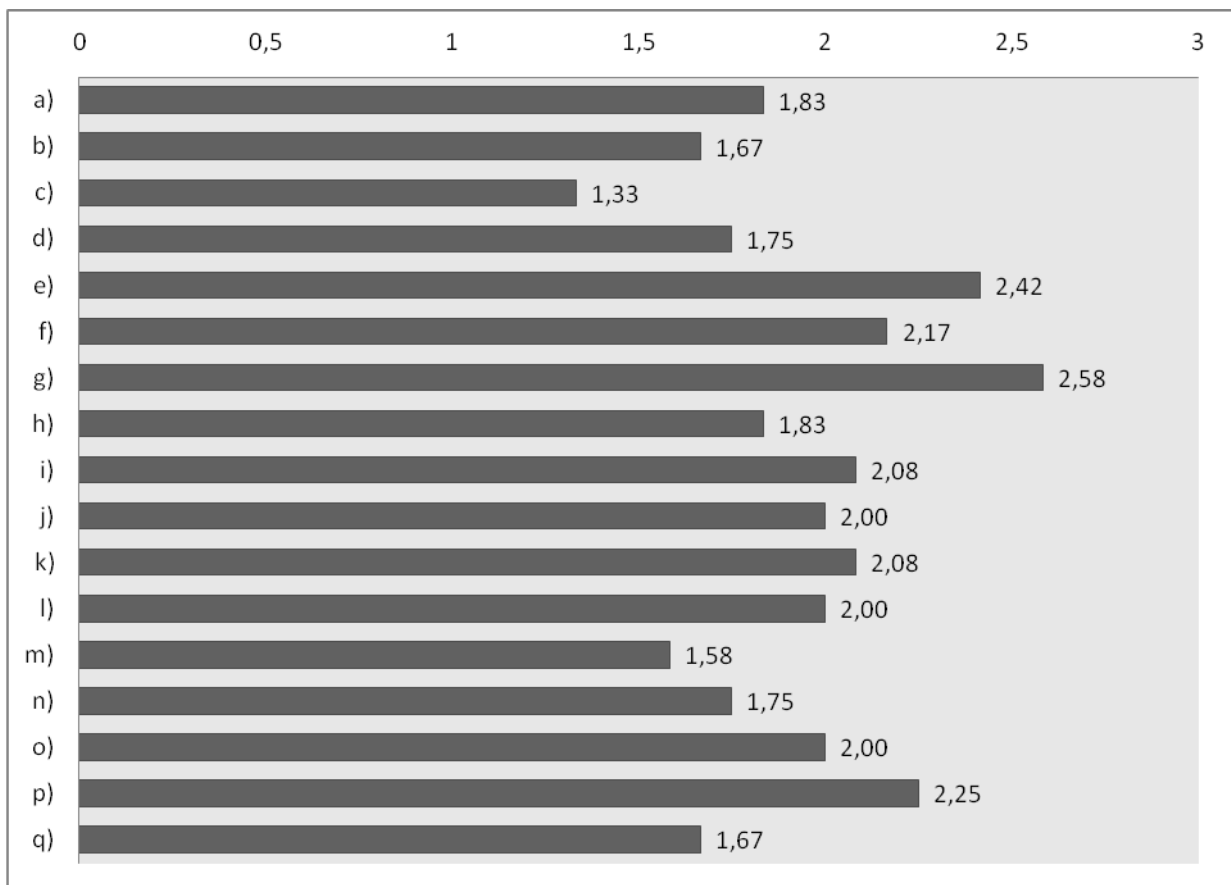


Fig. 1. Average assessment of the intended learning outcomes of the study programme (on axis X) on a five-point system (on axisY) (the smaller the assessment, the more significant the learning outcome)

Just like in the case of the study programme aims, the assessments of the intended learning outcomes were sufficiently high, and the differences were small. The Master students of Innovation Management gave the highest ratings to the knowledge of research novelties, innovations, and the latest contemporary technologies, their application to research, and the process of a new product creation. The respondents also indicated that innovation manager was to be able to work in an innovation-creating team, to organise personal and group activities, and to be responsible for the quality of one's own and subordinates' activity and its assessment on the basis of professional ethics and civic spirit.

In the master students' opinion, it was the least important for innovation manager to be able to justify the research findings orally and in writing, to substantiate the decisions of innovation management by integrating the findings of management and other research, as well as to be able to formulate a research problem in innovation management, to choose or design a research methodology, and to conduct independent research.

As the learning outcomes were related to the courses in the curriculum, the students' assessment of the core courses was established. The best appreciated courses were those related to projects, innovation protection, technologies, and market surveys. However, the comparison of the said outcomes and the further presented study quality assessment led to a conclusion that the students did not have a unanimous opinion.

For the study quality assessment, Questionnaires 1 and 5 were used, which asked the students' opinion about the content of each course, the lecturing, seminars, and independent work organisation, the general culture of the teacher, the required literature, the study materials, the objectivity of student assessment, teacher consultations, and the knowledge and skills acquired in the course.

The quality of all the core courses was assessed on the scale from 7 to 10 points. Although all the assessments for the study quality were high, the teachers' general culture (9,3 points) and the objectivity of assessment (9,6 points) rated the highest, while the lecturing of the course (8,7 points), seminars (8,9 points), and independent work (9,1 points) rated the lowest.

On the basis of the conducted research, one could formulate the principal directions of the study programme quality improvement:

- to develop the assignments of case studies, so that master students would be able to plan, manage, and co-ordinate the activities of research and development in an organisation and plan the needs for the budget;
- to organise the participation of innovative business organisations in the study process;
- to adjust the structure of the Master's final thesis, as a research paper, to the integral parts of the innovation management process. Then the research activity will be maximally harmonised with the curriculum courses.

Conclusions

1. The rather substantial staff turnover in Lithuanian enterprises is related to a shortage of the necessary knowledge of innovation, therefore, the delegated tasks are frequently performed in a non-quality way and not on time, moreover, stressful situations tend to arise.

2. The greatest need for innovation specialists occurs when inculcating global and national research achievements in business. The need for interdisciplinary studies of management and engineering is emphasised.

3. The need for qualified staff of innovation management and technologies is especially relevant for large enterprises.

4. The demand for the graduates of the study programme of Innovation Management and Technologies has been growing, therefore, the programme enjoys good prospects. Consequently, the number of students willing to get a qualified job can be expected to increase.

5. The aims of the study programme comply with the principal needs of the students, and the formulated learning outcomes are important and relevant in the training of innovation managers. The highest rated aim was the knowledge of research novelties, innovations, and the latest contemporary technologies, and their application to research and the process of a new product creation.

6. The quality of studies can, and has to, be improved by more active use of the method of case studies and the integration of the staff of innovative enterprises into the study programme.

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