струкции по эксплуатации обусловили недооценку таких компетенций, как способность работать самостоятельно, мыслить критически, планировать и распределять свое время, разрешать конфликты и вести переговоры, что в общем совпадает с результатами опроса других респондентов, имеющих отношение к инженерной защите окружающей среды [3].

Вместе с тем вузам, обеспечивающим формирование универсальных и предметно-специфических компетенций, необходимо с учетом полученных данных постоянно взаимодействовать с работодателем с целью повышения профессиональной компетентности будущих специалистов, а также понимая саму важность периодической корректировки требований к ориентирам обучения и собственно определению значимости компетенций в соответствии с изменениями их востребованности на рынке труда.

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COMPETENCY ASSESSMENT OF SPECIALISTS BY EMPLOYERS

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ABSTRACT

Three-year project TEMPUS provided for organization of network of Tuning centers in Russian universities. It afforded ground for development of methodological guidelines to form general and professional competences at universities. MIIT during joint actions of European and domestic specialists undertook, in particular, establishment of uniform standards for training programs on ecology, environmental engineering and surveys on these topics of the target groups, including employers, graduates and students. Research findings, presented in the article, introduce expert estimations of competence problems for practice, priority attention is given to opinion of employers of transport sector (JSC Russian Railways), and demonstrated findings intend mainly focus on their obligatory interaction with specialized departments and university teachers.

ENGLISH SUMMARY

Background.

In October 2013 successfully finished a three year project TEMPUS «Creating a network of Tuning centers in Russian universities» which united 4 European and 13 Russian universities. Its purpose was to establish a universal platform for the development of harmonized guidelines on six key subject areas, to ensure comparability, compatibility and transparency of relevant educational programs on the basis of competence-based approach.

During the project MIIT has been closely involved in the creation of uniform standards for program structure on ecology, environmental engineering, law, and information and communication technologies. The central place in this process was taken by development of a list of general and professional (subject-specific) competences and their subsequent use in the preparation of curricula related to environmental engineering, corresponding to European programs on environmental engineering.

Objective.

The objective of the authors is to analyze assessment of employees› competences, performed by employees themselves, employers and future specialists of railway complex.

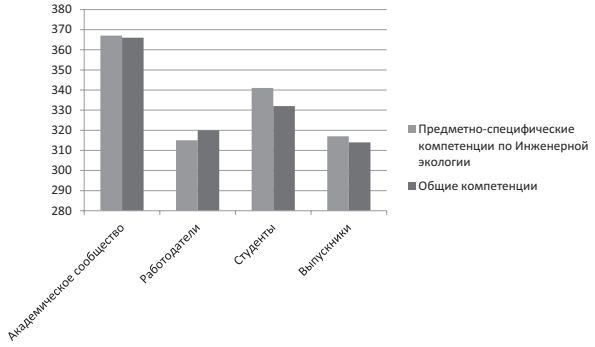
Methods.

The authors use descriptive method, analysis, comparison and different survey's methods.

Results.

1.

The basis for determining competences, which were the most consistent with the requirements of different categories of respondents, were the results of competence survey of four target groups – academic community, employers, graduates and students. The original questionnaire included 30 general (universal) and 25 subject-specific competences. [1] And performers have initially understood that universal competences have a dual nature. On the one hand, they are not just professionally determined. All modern specialists- regardless of activity- own these competences in varying degrees. On the other hand, universal competences should be professionally significant, because they play a decisive role in the formation of subject- specific competences. An important feature of universal competences is that they allow high school graduates to be in demand in the labor market in a broader sense, to successfully



Pic. 1. Number of participants of the survey conducted within the subject group «Environmental engineering».

fulfill themselves in other professions (areas not related to the qualifications acquired in university).

Subject-specific competences are more focused on the needs of practice and reflect specific features of knowledge fields, characteristic of use in specific professional fields and environments.

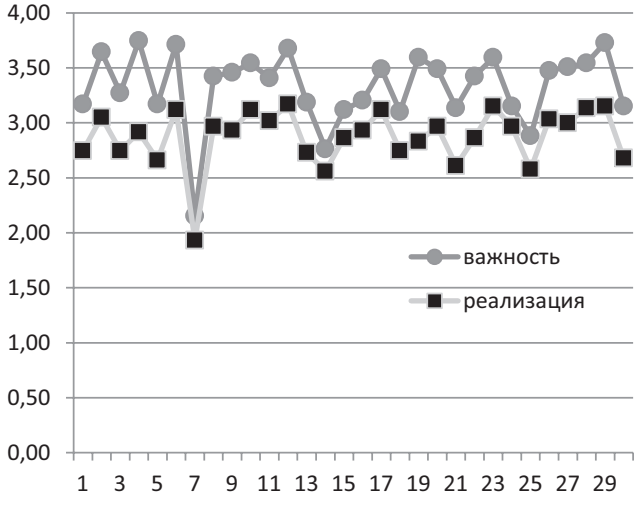
During the survey respondents were asked to rate the importance of each competence, the degree of its implementation at the university and professional activities, select five most important competences from the options. Members of the consortium, which was part of the subject group «Engineering Ecology» – S. N. Ovcharov (North-Caucasian Federal University), S. B. Kudryashov (Don State Technical University), K. B. Lyubimov (Nizhny Novgorod Lobachevsky State University), T. A. Novikova (Udmurtian State University), A. F. Fedotova (Astrakhan State University), E. C. Silina and I. V. Karapetyants (MIIT), with the assistance of the European expert Isent Manolo (Bucharest Technical University of Civil Engineering) – were invited to interview 30 respondents of the selected profile groups.

Besides six universities in the consortium subject group, in the survey were involved external experts from seven leading Russian universities and academies. Among them – Moscow Institute of Radio Engineering, Electronics and Automation, Graduate School of Innovative Business of Lomonosov Moscow State University, Moscow State University of Civil Engineering, D. Mendeleev University of Chemical Technology of Russia, St. Petersburg State Technological Institute (Technical University), Saratov State Technical University, Kazan Federal University.

In 2011, the survey was conducted for all four categories of respondents of work group, which functioned on the basis of Institute of International Transport Communications of MIIT, which collected and sent data electronically to the website of Deusto University (Bilbao, Spain) – European project coordinator. Respondents were asked to indicate which competences are most in demand in the areas of their business, to give their assessment of the adequacy of academic and professional knowledge in their practical use.

In conditions of still existing differences in knowledge that students receive, and qualification requirements in the performance of professional functions a survey of employers was of particular importance for the conducted study. Taking into consideration specialization of MIIT, nearly 90% of employers represented structures of JSC «Russian Railways». Among them there were 300 employees of administrative divisions of central and regional structures of the holding, including six railways (Gorkov, Kaliningrad, Moscow, North, Volga, South-East).

Processing results of the survey was conducted by the method proposed by International Academy of tuning (at the University of Groningen, The Netherlands). The rating was determined by priority use of a particular competence, extent and frequency of its use in the process of learning, in everyday professional activity. The maximum achievable value was equal to 4 points and above, the minimum achievable – 1. Respondents› categories of JSC «Russian Railways» were divided into three main groups:



Pic. 2. Ranking of general competences according to their importance and the degree of realization in terms of graduates and employers of JSC «Russian Railways».

– *Managers and specialists of environmental services,*

– *Chief Engineers,*

– *Specialists of other departments.*

2.

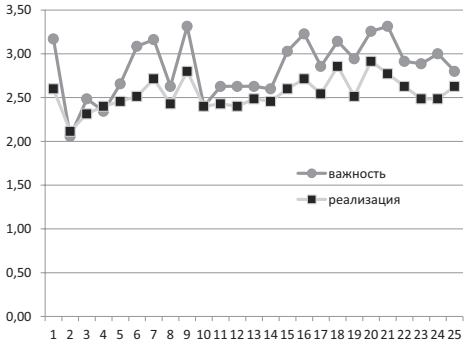
Following the results of the questionnaire a significant amount of information (answers) was received on the characteristics of importance of general and subject-specific competences in the field of «Engineering Ecology» (see Pic. 1–3). A total of 1,256 responses was obtained, the vast majority of employers (almost 90% of respondents) and graduates (85% of respondents) work in railway complex.

Pic. 2 shows the ranking of general competences, Pic. 3 – general engineering and subject-specific competences.

From Pic. 2 it is clear that such general competences, as 7 – ability to communicate in a foreign language, 14 – ability to think critically, 25 – interpersonal communication skills, are not of great importance from the standpoint of employers and degree of their implementation in universities is not enough, that is substantially a big challenge for education, especially transport education.

From Pic. 3 it is also clear that for employers general engineering competences such as 2 – ability to take part in theoretical and experimental studies, 3 – to know and understand the role and status of engineering profession in the socio-economic development of society, 4 – to possess the ability to visualize technical objects are also not significant for employers.

Of all general competences managers and specialists of environmental services put in the first place nine competences, including «Teamwork» and «Ability to identify, formulate and solve problems». In the second place was the competence «Ability to apply knowledge in practice». The third place was obtained by the competence «Ability to work independently», the fourth – «Ability to make deliberate decisions», the fifth – «Ability to communicate on professional topics with non-specialists in their field», as well as «Ability to think critically» and «Ability to resolve conflicts and negotiate».



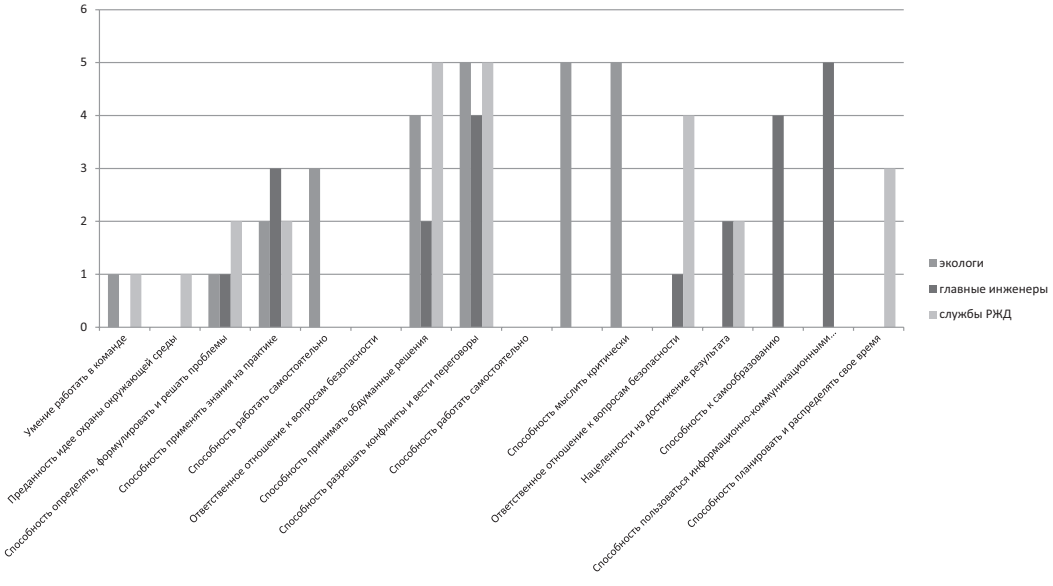
Pic. 3. Ranking of general engineering (1–13) and subject-specific (14–25) competences on their importance and degree of realization in terms of graduates and employers of JSC «Russian Railways».

The results of the second group on general competences (chief engineers) have shown the following.

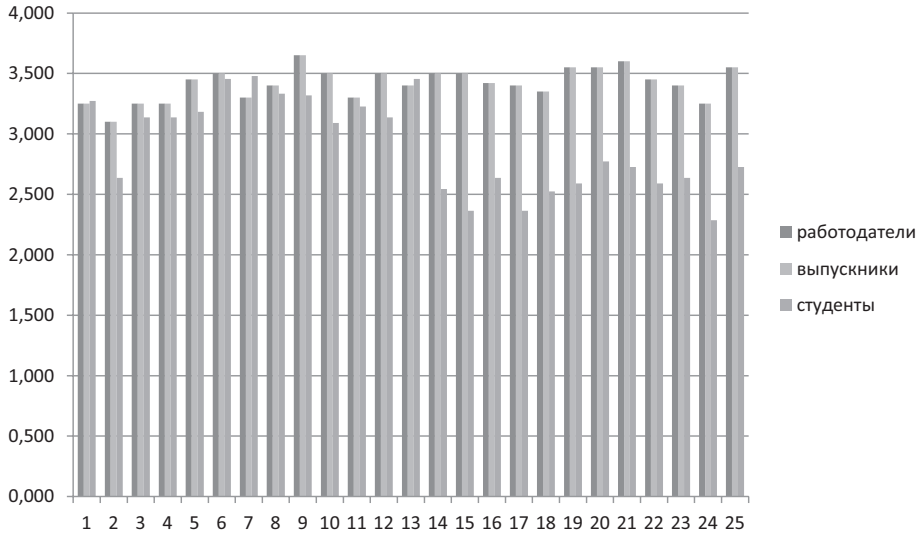
Of all general competences the first place was occupied by seven; the top positions were «Responsible attitude to security» and «Ability to identify, formulate and solve problems». The second place got seven competences; leaders were «Ability to make deliberate decisions› and «Commitment to results». The third place went to nine competences, the most popular – «Ability to apply knowledge in practice» and «Ability to make deliberate decisions». In the fourth place there were eight competences, including «Ability to self-education» and «Ability to resolve conflicts and negotiate». In the fifth place there was competence «Ability to use information and communication technologies».

3.

Assessment of general competences by the third group (specialists of JSC «Russian Railways› and its subsidiaries) gives its own distribution. In the first place there are 13 competencies; leaders – «Teamwork» and «Devotion to the protection of environment». In the second place there are:



Pic. 4. Importance of general competences by groups of respondents of JSC «Russian Railways».



Pic. 5. Importance of general engineering and subject-specific competences in groups of respondents.

«Ability to identify, formulate and solve problems», «Teamwork», «Ability to apply knowledge in practice», «Commitment to results». The third place is occupied by «Ability to apply knowledge in practice», «Ability to plan and allocate time», the fourth – «Responsible attitude to security». The fifth place – a group of leaders, «Commitment to results», «Devotion to the protection of environment», «Ability to make deliberate decisions», «Ability to resolve conflicts and negotiate» (Pic. 4).

The results of the analysis of the responses received from the respondents of JSC «Russian Railways» – the main customer of MIIT's graduates should be highlighted.

From general (universal) competences the highest scores were received by:

1. Teamwork.

2. Ability to identify, formulate and solve problems.

3. Devotion to the protection of environment.

Teamwork is a personal competence, the most valuable feature that is appreciated by employers. It helps to quickly «get used» to the team, to take the challenge of general strategic ideas of an enterprise, to join forces, to replace if necessary, other members of the work group.

Ability to identify, formulate and solve problems is both universal and general professional competence as it assigns to an expert the opportunity to think independently, to see the task in his own way, to be able to put into practice a creative resource and qualification skills.

Dedication to environmental protection is a key competence of not only common cultural order, but also universal for many professional areas. In an apparent strengthening of global environmental degradation it becomes urgent to search for new environmental approaches in applied human activity, form and use ecology-oriented values in everyday life. For environmentalists, dealing with transport issues, such competence is system-forming for all directions of their scientific-practical and functional activity.

The second place was taken by general competences:

1. Ability to apply knowledge in practice.

2. Focus on achieving results.

Ability to apply knowledge in practice relates to system competence, its formation is the main purpose of educational activities, primarily the result of training. It measures the quality and effectiveness of training programs, the professionalism of teachers, overall competence of the graduate, depth and level of learning their professional disciplines.

Commitment to results is no less important competence, which in the employer's opinion is the ability of an employee to align leader's goals, company's mission, self-motivation and knowledge into a unified system of well-organized work.

The third place was shared by:

1. Ability to work independently.

2. Ability to make deliberate decisions.

3. Ability to plan and allocate time.

Ability to work independently is always appreciated by the employer because an employee, optimally organizing his time, realizing obtained qualification by maxim skills without constant recourse (council) to representatives of the administration and other colleagues, is important, often the most effective link in the team. Specialist with such a competence can quickly mobilize his knowledge to achieve goals, learn basic objectives of the company and show personal qualities, necessary for their solution.

Ability to make deliberate decisions is no less important competence for the employer; it also should not be underestimated. It brings to light analytical skills of an employee, helps him to concentrate on the main issues of realizable projects, to develop logical thinking, so valuable in making deliberate decisions.

Willingness to plan and allocate time distinguishes a person from others, since a person able to appreciate time, manage it, distribute it for the benefit of his activities, is indispensable for the organization of the administrative apparatus, and ordinary employees.

In the fourth place there were competences:

1. Responsible attitude to security.

2. Ability to self-education.

3. Ability to resolve conflicts and negotiate.

Responsible attitude to safety issues (both personal and collective) for the employer such as JSC «Russian Railways», is a competence, determining

professional readiness of an employee to carry out any responsible activity in the enterprise. For specialists in the field of environmental engineering presence of this competence means the ability to recognize and assess dangerous and harmful factors of techno sphere, production situation, environment and human activities, as well as ability to create a protection system.

Ability to self-education is motivating employees to continuously improve their professional, intellectual and cultural levels, which is important for the employer. This is due to the fact that competence becomes the main tool for development and improvement of skills of an employee throughout his professional career.

Ability to resolve conflicts and negotiate is the main part of the set of personal competences of an employee. Its underestimation by the employer leads to the risk to cause negative effects, often destructive, in the course of joint activity and interaction of the enterprise with external environment. Inability to avoid conflict and negotiate is fraught with danger to «blow up» labor collective from the inside, especially in large organizations.

The fifth place, the last one in employer's assessment, was taken by such competences as «Ability to think critically», «Ability to communicate on professional topics with non-specialists in their field». Some disregard of their importance is caused by specifics of «Russian Railways», especially its activities related to the exploitation of finished certified facilities that minimizes demand in critical approach of employees to carry out their professional tasks, development of their communicative relationships outside the professional environment.

Interestingly, moreover, that from the standpoint of the employer- JSC «Russian Railways› competences such as «Ability to abstract thinking, analysis and synthesis», «Ability to communicate in a foreign language», «Understanding and respect for diversity and multicultural society», «Ability to conduct scientific research at an appropriate level», are not relevant at the moment, which does not coincide with the opinion of employers from other professional groups. [2] With deepening of integration of Russia in the field of transport in the framework of WTO, EurAsEC, Customs Union, regional organizations such as APEC or BRICS importance of these competences will continue to grow.

It is also useful to compare the assessment of general engineering (common to all engineering disciplines) and subject-specific competences (for environmental engineers) of all groups of respondents. Pic. 5 shows the results of a survey about the assessment of importance of competences by employers of JSC «Russian Railways», and together with them university graduates, the majority of which are employees of the railways, and senior students of MIIT.

There is a full concurrence of employers› and graduates› opinions related to all general engineering and subject-specific competences. At the same time, if the students› opinion on virtually all general engineering competences coincides with the views of employers and graduates, their opinions on subject-specific competences differ.

Difference of opinions is especially great on such competences as «Ability to formulate and defend a position in the environmental debate», «Ability to predict the state of environment», «Ability to formulate the tasks of ecological design», «Ability to conduct technical and environmental analysis of objects of economic activity and technical documentation». The reasons can be lack of experience of students in practical work in this direction, and faults of appropriate content and quality of training in universities.

Conclusion.

Results of the survey showed that for the employer- JSC «Russian Railways» priority is owned by basic competences of an employee that are directly connected with his personal features (ability to work in team, ability to formulate and solve problems, apply knowledge in practice, commitment to results).

Importance of subordination, fulfillment of disciplinary requirements in the company, the need to strictly observe safety rules and technical operation instructions caused underestimation of competences such as ability to work independently, think critically, plan and allocate time, resolve conflicts and negotiate that generally coincides with results of other respondents› survey results related to environmental engineering [3].

However, universities providing formation of universal and subject-specific competences should with respect to obtained data constantly interact with the employer in order to increase professional competence of future professionals, as well as understanding the importance of periodical adjustment of requirements for guidelines for education and determination of competences› importance in accordance with the changes in the demand for them in the labor market.

Keywords: university education, professional competence, university graduates, employers, labor market, TEMPUS project, competence-based approach, training of specialists.

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