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## DEVELOPMENT OF THE NATIONAL QUALIFICATIONS SYSTEM: THE IMPACT OF TRANSHUMANISM

### Abstract

The article discusses the problems of developing new educational programs for universities and issues that need to be addressed by coordinating with various system institutions under the influence of transhumanism. The methods of analysis, generalization of the regulatory and methodological framework, and external expertise in interaction with employers were used. The scheme of interaction of elements of the national qualifications system in developing an educational program is presented. The hypothesis of the need to include all elements for the development of educational programs has been tested. The correlation dependence and percentage approximation results proved the need to use all components to develop educational programs. Several issues related to universities' development of educational programs and requiring further clarification are highlighted, including issues of harmonization of professional and educational standards under the influence of transhumanism. The work results determine the following directions for the further development of educational programs: 1. normative and methodological development, 2. the use of external expertise and evaluation, and 3. expanding opportunities for further development of unique programs with active cooperation with employers.

*Keywords:* national qualifications system, educational programs, universities, professional qualifications councils, examination of educational programs, transhumanism.

### Introduction

Over the past few years, we have observed the development of particular elements of the National System of Qualifications (NSQ) and the evolvement of their interaction (the period from 2014 up to the present).

“The National Qualifications System (NQS) is a set of legal, organizational and institutional mechanisms, ensuring the coordination of supply and demand for qualifications, the collaboration of vocational education and labour, the creation of conditions for professional growth and the improvement of labour resources quality that comply with national and international requirements” (Strategy for the development of the na-

tional qualifications system of the Russian Federation for the period up to 2030, 2021; Decree on the National Development Goals of the Russian Federation for the period up to 2030, 2020).

The development of the elements of the system of qualification and training of specialists aims at the formation of mechanisms for competitive specialists training by educational institutions, which will provide, in its turn, the labour market with the candidates of the required level, taking into consideration the Russian as well as international requirements.

The development of the national qualifications system sets the universities and their education programs the tasks of training specialists for strategically essential tasks for the labour market

and various branches of the economy. As the world practice and the successful experience of the Russian educational programs implementation demonstrates, it is possible due to the mechanisms of active interaction and mutual support of various elements of qualification and education system (Strategy for the development of the national qualifications system of the Russian Federation for the period up to 2030, 2021; Decree on the National Development Goals of the Russian Federation for the period up to 2030, 2020).

The purpose of the article is to compare the elements of the national qualifications system in developing educational programs and the influence of transhumanism. To achieve this goal, the authors propose developing educational programs of higher education in the context of the evolution of NQS. The experience of developing an educational program on the main “Innovations” allowed us to draw some conclusions and offer options for active interaction between elements of the national qualifications system and the educational community.

### Literature Review

Many authors support this point of view, including the one that concerns the training of specialists in the transport industry (Degtyareva, Lyapina, & Tarasova, 2021). Many researchers take upon Industry 4.0 impact on the labour market in their works. For example, Grodek-Szostak, Z., Siguencia, L. O., Szlag-Sikora, A., and Marzano, G. (2020) highlight the potential opportunities and problems arising with employees as well as with employers in the context of Industry 4.0. This approach is being developed in work devoted to the training of IT specialists (Szafranski, Gütmen, S., Graczyk-Kucharska, & Weber, 2022). Researchers Chala, N., Poplavska, O., Danylevych, N., and Maksma, M. (2021) analyse the models of the employees’ competencies under the condition of Industry 4.0. The process of the labour market transformation and the study of the main trends of intelligent technologies’

impact on it is reflected in work by Mizintseva, M. F., Gerbina, T. V., Sardaryan, A. R., and Chugrina, M. A. (2021).

The pandemic produced a particular impact on the labour market that was previously influenced by the factors and products of the technological process due to the manifestation of crisis phenomena. The researchers Smolina, E. S., Greshnova, M. V., and Ryzhova, A. S. (2021) refer to this problem. The pandemic has impacted the geography of the labour market (Herod, Gialis, Psifis, Gourzis, & Mavroudeas, 2022).

An axiological or value-based approach to analysing various aspects due to the global digitalization and identifying the most relevant competencies for existing professions present one more subject for discussion. The paper by Mantulenko, V. V., Zotova, A. S., and Makhovikov, A. E. (2021) analyses the influence of digitalization on the creation of new professions and the destruction or transformation of the old ones, as well as the competencies required in future. There is a need for professional competencies related to the needs of enterprises in the era of the Fourth Industrial Revolution (Szafranski, Gütmen, Graczyk-Kucharska, & Weber, 2022). Higher education institutions also need to change, and there is a need to train people with digital skills (Teixeira, Gonçalves, & Taylor, 2021). Also, changes in higher education institutions have occurred due to the impact of the pandemic (Dereso, Meher, & Shobe, 2022). The challenges of the economy, digital transformation and their influence on the labour market are defined by the actual set of new competencies (Vladimirov, Kamchatova, & Burlakov, 2021) due to the realization of the main provisions of digital changes. This topic is highlighted by Guseva, M. S. (2021) on the example of a particular region.

The analysis of the impact of the digital transformation on the labour market and the justification of the necessity of training and retraining of the employees in the context of digital education are reflected in the research by Gromova, T. V. (2021). The emergence of new competencies

requires the improvement of the education system. Intellectual backlogs allow educational institutions to train updated personnel at the employer's request.

The current state of the human capital and the educational environment as an essential factor of its transformation may have a particular connection with profound social-economic changes which influence the labour market. In his work, Popov D. S. (2020) treats these issues. The change in consumption and the transition to a circular economy of a complete cycle give the prerequisites for the emergence of new competencies in existing professions.

The classification of challenges of digital transformation of global, national and regional economies, the structured causal relationship of the unstable state of the economy with structural shifts and cyclical recession, and the possibility of eliminating the causes of the unstable state of the labour market by using digital technologies are analysed by Golovetsky, N. Y., Grebenik, V. V., and Khamalinskaya, V. V. (2021) on the example of a particular region. It is necessary to consider the peculiarities of the sectoral development of a particular region to train specialists of the required level.

In the work of Degtyareva V. V. (2021), practical skills and tools that specialists who have received education should possess in order to apply them in practice are actively considered. The formation of additional skills among specialists as part of the implementation of Industry 4.0 technologies creates the preconditions for structural changes in the education system.

The following significant problem that influences the choice of the profession and the branch of labour is labour mobility. The primary trend of the labour mobility of the population is treated by Tikhonov, A., Novikov, S., Kalachanov, V., & Solimene, U. (2020). There was no system for distributing specialists, which did not work very well in the USSR. At present, measures have appeared in the Russian Federation to support young specialists, which allow specialists to stay

in the regions.

A special place in forming the educational program should be given to transhumanism. Its active influence on transnational and intercultural differences (Gil Martínez & Vorontsova, 2020) should be taken into account when developing educational programs without much influence from political, ethical or religious differences, which is another most challenging challenge (Chetverikova, 2018). The impact of the transhumanistic approach on the educational environment must be considered when developing the required competencies.

Thus, the problem under study is currently relevant. The authors reveal various aspects of this problem. The paper will clarify some aspects stated in the literature review.

### Methodological Approach

The study was conducted using analysis methods, generalization and study of the results of activities. The normative and methodological support, the possibilities of external expertise, evaluation and expansion of opportunities for further developing unique educational trajectories in active cooperation with customers are analysed and summarized. The scientific results of the authors are used in the development of their educational program.

Within the framework of regulatory and methodological support, decrees, strategies, federal laws, and labour legislation related to education and obtaining the necessary skills laid down in the primary documents of the country to achieve professional development are analysed.

The roles of the relevant elements (institutions) within the study framework are determined. The NQS concerning the goals of developing education and strengthening interaction with the labour market are as follows:

- National Agency for Qualifications Development (NAQD) – the central role is to form the coordinated position of all the system participants on the formation and development of

NQS.

- Professional qualifications councils in various fields (PQC) – the development of the professional standards (PS), independent assessment of qualifications, professional and public accreditation (PPA) of educational programs in the relevant fields, etc.
- Ministry of Science and Higher Education – the development of the educational standards in training (e.g. Federal State Educational Standard 3++, Federal State Educational Standard 4), etc.
- Enterprises, organizations, industry communities, etc. – the formation of the requirements for the profession, participation in the development and public discussion of the professional standards for the relevant professions and fields of activity, etc.
- Educational organizations – development of educational trajectories for relevant areas of education (e.g. for the universities' Self-imposed Educational Standard (SIES), Model Principal Educational Program (MPEP), Principal Educational Program (PEP), retraining, etc.)
- Expert and consulting organizations - conducting expertise of educational programs (for example, PPA), participating in the development and review of training programs, etc.

The approach mentioned above is entirely consistent with the well-known concept of the “Triple Helix” by Henry Etzkowitz (Etzkowitz & Leydesdorff, 2000; Etzkowitz, 2003), the essence of which is that the most successful and worldly-recognized form of participation of universities in the development of an innovative economy is a model of close interaction between business and universities with an integral role of the state, whose influence is noticeable in any sphere, especially in Russia. This point of view is supported by other foreign authors (Liu, Zhang, Chen, & Zhang, 2021; Ribeiro & Nagano, 2021).

To date, some experience in the interaction of

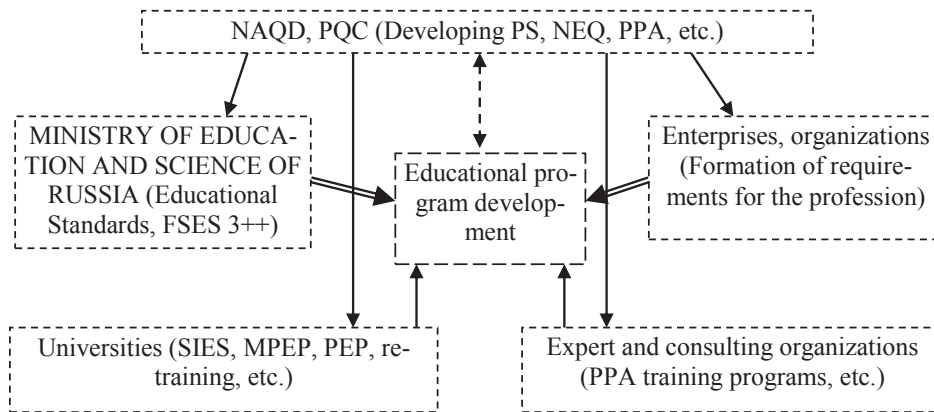
elements of the education system and qualifications has already been accumulated, but developing a specific educational program demands a unique complex of solving interaction problems (Degtyareva et al., 2021; Lyapina, Tarasova, & Fedotova, 2020; Mantulenko et al., 2021; Jüttler, Schumann, Neuenschwander, & Hofmann, 2021).

Their analysis was carried out to test the hypothesis of the need to include all elements in creating modern educational programs. We worked with a sample of 14 training areas and more than 44 educational programs in 3 higher educational institutions. The results obtained using the dependence correlation and the percentage of approximation will help to understand the need to include all components and the degree of their influence on this model. This can affect student satisfaction and the comparable quality of educational service delivery (Abbas, 2020) and the development of professional skills that modern graduates should possess (Yu, 2017).

Further development of the NQS from the perspective of the tasks of developing successful educational programs is possible only if there are clear and understandable rules of interaction with the relevant institutions of the system, methodological tools, as well as the implementation of the conditions for close cooperation between educational organizations and employers and their motivation for partnership. All this determined the essence and results of the study.

### Conducting Research and Results The Main Elements of NQS in the Development of an Educational Program

Let us consider the main processes of developing an educational program on major “Innovations”, taking into account the specifics of the transport industry through interaction with various elements of the national qualifications system (Figure).



*Figure.* Interaction of elements of the national qualifications system in developing an educational program (developed by the authors).

1. Ministry of Science and Higher Education of the Russian Federation. When developing an educational program, an educational organization solves the following questions: based on what standard and on what major (for example, the Federal State Educational Standard) the program will be implemented, what level of training is required (for example, bachelor's degree/master's degree/speciality), areas of professional activity, etc. Solution options: based on the Federal State Educational Standard of higher education bachelor's or master's degree on major "Innovations", the field of professional activity-choose one of the proposed in the standard or specify another, provided that the level of education and the acquired competencies meet the requirements for the qualification of an employee (an example of the field of professional activity for the significant "Innovations" (bachelor's degree) - aircraft engineering, "Specialist in aviation program management").

2. Professional qualifications councils in various fields (PQC). Tasks: to determine on the basis of which professional standards the educational program will be developed, to check the compliance of the level of education, to consider the possibilities of coordinating professional competencies and indicators of their achievement with the appropriate working group within the corresponding PQC. Solution options: for programs in the transport industry, the choice of

PQC for interaction can be determined by the type of transport and the field of professional activity (for example, PQC in railway transport, PQC in the elevator industry, in the field of lifting structures and vertical transport, PQC in the field of rocket technology and space activities, PQC in marine and inland water transport, etc.). Further, professional competencies are developed based on one or more selected PS. Indicators for them are developed based on labour functions or are justified in another way (for example, the employer's opinion). In addition, it is worth evaluating the possibilities of passing the procedures of professional and public accreditation (it is advisable to do it on the basis of the main PS taken as the basis for the development of the program) and the procedures for independent assessment of students' qualifications (it is so far limited for higher education programs due to the requirements of obtaining education and experience).

3. Enterprises, organizations, industry communities, etc. Tasks: coordination/formation of requirements for the educational program, participation in the development and public discussion of educational programs, reviewing. Possible solutions: developing professional competencies and indicators of achievement with representatives of the leading employers, obtaining reviews of professional competencies for the program and/or the educational program as a whole, coor-



dination of practical training programs and internships for students, etc.

Employers interact with universities based on choice and study program. For example, for the transport industry, these may be the Ministry of Transport of the Russian Federation, JSC “Russian Railways”, the Moscow Metro, the State Corporation “Roscosmos”, PJSC “United Aircraft Corporation”, specialized research institutes and structures of the transport industry (JSC “VNIIZHT”, JSC “NIAS”, JSC “IERT”, JSC “VNIKTI”, JSC “Agat” Organization”), etc.

4. Educational organizations. Tasks: consideration of the feasibility of developing joint educational programs on the major specialisation, work experience analysis, receiving feedback, etc. Possible solutions: deciding on the feasibility of online educational programs; studying curricula, discipline programs and materials on similar programs (presented in open access, for example, on universities’ websites); deciding on reviewing programs by representatives of the university community. Extracurricular activities with a partially professional orientation are also possible (conferences, master classes, exhibitions, etc.).

5. Expert and consulting organizations. Tasks: making decisions on attracting organisation representatives to examine and review individual tasks; examining the implemented educational programs as a whole. Possible solutions: obtaining an official examination for an educational program (for example, PPA); consulting and/or

partial examination of blocks or modules of the program; finalization of educational programs, etc.

As for the experience of conducting professional and public accreditation of higher education programs, it is worth paying attention to two aspects - the expediency of obtaining a PPA certificate and an organisation's choice for this purpose. The loss of accreditation leads to a decrease in the level of perception of the organization (Castro, Pavez, & Contreras, 2021). In this regard, with the approval in 2020 of the Federal State Educational Standard for Higher Education (for the major “Innovations” as well), which includes direct requirements for taking into account professional standards when developing educational programs, obtaining a PPA certificate is an external confirmation of the program’s compliance with the requirements of professional standards and employers (at least in terms of professional competencies). When choosing an organization for conducting a PPA, it is necessary to check the fulfilment of two conditions: the authorization from the relevant PQC to conduct a PPA according to the Council’s work direction and representation in the list of the Ministry of Education and Science. In addition, following the PPA procedures can increase the rating of an educational program in competitive bids.

The hypothesis of the need to include all elements in the development of educational programs will be tested when determining the correlation between dependent indicators (Table 1).

Table 1.

Data on the Assessment of Correlation between Dependent Indicators  
in the Process of Creating an Educational Program (developed by the authors)

	Y - Effectiveness of the educational program	X1 - Ministry of Education and Science, regulatory and legal documentation	X2 - PQC	X3 -Expertise in enterprises, industry communities	X4 - Experience in educational organizations	X5 - Expertise in consulting organizations
Y - Effectiveness of the educational program	1	0,62	0,18	0,53	-0,02	0,31

X1 - Ministry of Education and Science, regulatory and legal documentation	0,62	1	0,14	0,81	-0,06	0,35
X2 - PQC	0,18	0,14	1	0,20	-0,09	0,03
X3 - Expertise of enterprises, industry communities	0,53	0,81	0,20	1	0,02	0,19
X4 - Experience of educational organizations	-0,02	-0,06	-0,09	0,02	1	0,18
X5 - Expertise of consulting organizations	0,31	0,35	0,03	0,19	0,18	1

When calculating, the following indicators showed the most significant dependence on the variable Y – the effectiveness of the educational program from the dependent ones in descending order:

X1 - Ministry of Education and Science, regulatory documentation;

X3 - Expertise in enterprises and industry communities;

X5 - Expertise in consulting organizations;

X2 - Tips on professional qualifications;

X4 - Experience with educational organizations;

The approximation of the model was 6.5%, which proves the need to include all components in the development of modern educational programs.

Examples of solutions for developing educational programs in interaction with various are presented in Table 2.

Table 2.

Examples of Solving the Problems of Developing Educational Programs in the Framework of Interaction with Various Elements of the NQS (developed by the authors)

№	Tasks to be solved when developing an educational program and interacting with various institutions	Educational program “Innovations in transport” (Bachelor’s degree level)	Educational program “Research and analytics in the transport industry” (Master’s degree level)
1	The task of substantiating the FSES to develop the program	The choice of the FSES for bachelor’s degree programs is almost immediately connected with the program’s orientation.	Development based on the FSES for Innovations. Master’s degree programs with contents in innovation can also be developed based on other FSESs, such as “Economics”, which may be associated with developing competencies at the intersection of several areas.
2	Areas and spheres of professional activity	Initially, the choice is based on the FSES specified list, which can then be from other areas. An important issue here is understanding the activity’s multi-sectoral (or not).	
3	Selection and justification of the professional standard(s) for professional competence development	At first, the choice is based on the FSES specified list but, as a rule, concerning the field of professional activity.	
4	Choosing the tasks of professional activi-	It can be recommended in consultation with representatives of	

	ty	<p>the leading employers and leading companies in the industry. Focus on the goals of the type of professional activity specified in the professional standard and the group of occupations (All-Russian Classifier of Occupations) and types of economic activity (All-Russian Classifier of Economic Activities) specified in the selected professional standard.</p> <p>Use Russian classifiers in general: All-Russian Classifier of Occupations, All-Russian Classifier of Economic Activities, etc.</p>	
5	Tasks of interaction with employers, industry/professional communities, etc.	Work with representatives of employers during the development and implementation of programs (questioning employers to understand the needs for training specialists, developing programs on request, a practical training base, etc.).	Interaction is complemented by work with research structures, research institutes, etc. For example, analytical associations, the industry analytical centre of the Russian Open Academy of Transport, JSC "Russian Railways" (research and analytical divisions), State Corporation "Roscosmos", Specialized Research Institutes and structures of the transport industry (JSC "VNIIZhT", JSC "NIIAS", JSC "Agat" Organization", etc.).
6	Tasks of interaction with the Professional Qualifications Councils	Coordination of professional competencies and indicators of their achievement with recommendations from the PQC (for the 6th level of qualifications), participation in round tables and public discussions, etc.	Coordination of professional competencies and indicators of their achievement with recommendations from the PQC (for the 7 <sup>th</sup> level qualifications), participation in round tables and public discussions, etc.

In general, in developing the NQF, it is possible to note tendencies toward strengthening the interaction between various system components. At this stage of development, we observe the coordination of the PS and the Federal State Educational Standard requirements, which is directly reflected in the approved Federal State Educational Standard and the primary "Innovations".

#### Directions for Further Development of Educational Programs

In the course of considering interaction tasks in the development of educational programs with various institutes of the NQS, some directions were identified for further development and clarification of options and forms of work:

1. Taking into account the Federal State Educational Standard requirements and employers' requests in the development of the program. Current situation: higher education programs in the field of "Innovations" are designed following the current Federal State Educational Standard requirements and, as a rule, taking into account the experience of implementing programs. The needs of employers are taken into account in terms of professional programs (the development of professional competencies, indicators, and disciplines). Idea: when interacting with employers, discuss the ratio of professional competencies that are in demand now, and consider the forecast of the profession's development in the future.

2. The base of professional standards used in



the development of educational programs. Current situation: according to higher education programs, universities independently implement a scheme for choosing professional standards and form professional competencies on the basis of them (as a rule, on the basis of those recommended by the Federal State Educational Standard). Idea: at the moment, the mechanism for justifying the choice of PS and the development of professional competencies are given to the university itself, and there appear various program development schemes. One of the solution methods is the development of recommendations for the formation of professional competencies of the corresponding PQC (by levels of education) due to this additional strengthening of the elements of the NQF. When it is necessary to develop an industry-specific program, there should be an additional justification of professional competencies with links to relevant research and peer review of programs by professionals.

3. Development of teaching materials and assessment tools. This task is essential in developing the content of the program (disciplines, teaching materials, assessment tools, etc.). Current situation: universities and developers of programs, as a rule, develop training materials using the capabilities of employers, other educational programs of universities, etc. Idea: to expand the possibilities of assessment tools for independent assessment qualifications developed by the PQC for the current PS. Another debatable issue related to the use of assessment tools developed by the Councils for the relevant PS is the expediency of a joint assessment of qualifications with the final state certification procedure. Such tasks are implemented in the SVE system but not solved in the higher education system. Idea: considering the possibilities of using assessment tools to check the completeness of professional competencies at various stages of forming competencies.

4. Taking into account the development of the industry in the formation of educational programs. Current situation: the designation of

the industry's circumstances begins with choosing the field of professional activity in the formation of the program. According to experience, it was confirmed by comments/reviews of the educational program and its components. Idea: taking into account circumstances and requests for the industry assumes building a system of interaction with leading companies and research and analytical organizations in the industry (as noted earlier, for transport, for example, Russian Railways, State Corporation Roscosmos, etc.), which is especially important for the formation of specific master's programs. Such work begins with designing an educational program (including practice) and can also include the organization of laboratories according to the company's tasks.

A significant debatable issue in forming an educational program is accounting for specific objects of the industry, region, etc., in its contents. So, for example, taking into account the internal characteristics and technologies of the industry and how global trends affect its development is relevant, for instance, for educational programs in the field of "innovations in the transport industry". The contents of such programs should reflect the following aspects of training: taking into account global trends that are changing the world economy as a whole, the tasks of digital transformation (associated with management issues and new relationships when working with a client), a new approach to innovation, associated not just with technological innovation, but with the development of the "product and business process" approach, etc. Since modern transport companies understand the importance of forming an integrated view of innovation and changing competition in the market from rivalry to cooperation and partnership of transport companies (technological innovations can be implemented only when building strategic decisions among companies, taking into account external industry factors of activity), such issues can only be resolved in close cooperation and discussion with representatives of several employing companies of future graduates of the

program.

5. Information and communication opportunities used by universities in the learning process. Current situation: universities actively use information resources to post educational materials, conduct online classes, and test the development of educational materials; for this, they actively use various public platforms (for example, Skype, Zoom, etc.). Idea: still debatable are the issues related to the decisions to transfer the central part of the education process to remote formats, how much this affects the quality of the results, what methods of presenting educational material and assessing knowledge to choose from depending on the goals and forms of education, etc.

The described elements show the influence of transhumanism, allowing students to study precisely the subjects they are interested in and will be helpful in their professional activities (Chetverikova, 2018).

### Discussion

The authors' scientific novelty consists in offering new approaches to the development of educational programs under the influence of transhumanism. The authors tested and confirmed the hypothesis using correlation dependence and percentage approximation of the need to include the following elements in the development of educational programs:

- Ministry of Education and Science, regulatory documentation;
- Expertise in enterprises, industry communities;
- Expertise in consulting organizations;
- Tips on professional qualifications;
- Experience in educational organizations.

Examples of solving the problems of developing educational programs in the framework of interaction with various elements of the national qualifications system are analysed on the example of specific bachelor's and master's degree programs.

### Conclusion

During the considered period of development of the NQS, there is an increase in interaction between the participants in the system's formation. Today, this can be found in the legislative sphere. For example, we see requirements for consistent educational and professional standards in higher education.

Consistency requirements can also be found in the structure of the designed educational programs. For example, if the educational program has a specific specialization profile or industry affiliation, the professional part should be developed considering the industry affiliation of the field of activity and the corresponding professional standards (individual labour functions).

Further development of higher education programs within the framework of the NQS development fields poses questions for universities related to understanding the ratio of the formation of universal and particular/professional competencies, since in a rapidly changing world with modern digitalization opportunities, it is necessary to understand and forecast the need for the formation of "soft" and "infrastructural" management skills related to the restructuring and flexible management of various systems, which is very relevant for the transport industry, considered in the example of the article. Engineering specialties require a particular approach to forming competencies (Chan & Luk, 2022). This will allow universities to choose a learning-oriented approach (Combey & López, 2022).

The importance of interaction between universities and employers continues to grow. The practice of corporate structures shows that the search for "talents" is moving to the beginning of the educational chain (preschool and school education), and it is necessary to build educational programs in universities taking into account such features. Another peculiarity is when universities understand that it is impossible to study individual modules and topics without inviting a practising teacher from a specific company.

Another direction in developing university programs is the formation of unique private programs. Moreover, the uniqueness, on the one hand, manifests itself in the implementation of single educational programs at the request of the employer-customer, the possibility of quickly making changes to the current program, and, on the other hand, in need to take into account the individual characteristics of the audience (personal perception, the need to combine the possibilities of on- and offline learning listeners in one group, etc.). Such issues are still poorly regulated by the current standards.

All of the above allows us to outline further tasks for the development of higher education programs by searching for new options for the interaction of various institutions of the NQS, which make it possible to develop educational programs that meet the needs of the labour market, ensuring the continuity of educational trajectories with the formation of a specialist's qualifications. This approach is entirely appropriate for training specialists in the field of innovation.

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