

BRITISH EXPERIENCE IN STANDARDIZATION OF THE IT INDUSTRY

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Summary

The article is devoted to a review and analysis of the features of standardization of professional training of computer specialists in higher education institutions of Great Britain. Thus, the issue of coordination of professional and educational standards as tools for effective management of the quality of higher education, in particular in the field of information and computer technologies, is considered.

It is well known that one of the main conditions for the growth of the economic development of a particular country is high-quality professional training of future specialists for various sectors of the state's economy. The choice of the country as the subject of the current study due precisely to the fact that demonstrates extremely high performance in the IT sphere, using the latest innovations that are effectively implemented, particularly in the IT education. «As catalysts of [these] innovations, British universities study the training of IT specialists in accordance with the requirements of the labor market, government requests and the needs of society» (*Pazyura, 2019: 215*). The system of training highly qualified specialists with a traditional focus on the development of human potential and continuous improvement of acquired experience, based on the concept of lifelong learning, has become an instrument of the British economic strategy at the national level.

Currently, the British educational model of training specialists in the field of engineering and technology has become the most authoritative in the world in terms of quality and fundamentality of education, which is associated with a clear line of formation of a complex of professional competencies and their continuity at all educational levels, which is ensured by the basic principles of standardization as normalized bases for determining the content of training of higher education applicants in the IT field. This model is an example for Ukraine in the context of implementing the positive experience of the strategy of standardization of professional training of IT specialists.

Key words: information technology, computer specialists, higher education system, professional training, IT industry, professional and educational standards, IT education.

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1. Introduction

Information and communication technologies are the main area of growing in the national economic area in many developed countries of the world, when the demand for highly qualified specialists in this area, namely IT specialists, continues to grow steadily. In modern society, the IT industry is gaining significantly greater importance, since it allows solving complex practical problems in all other industries related to digitalization. Currently, it is the IT sector that is a priority area of activity and development of many countries, including Ukraine, which is of great strategic importance associated with the constant expansion of its scope.

It is worth noting the characteristic features inherent in the information technology industry, including its high integration into all processes of life in modern society, as well as its extremely high dynamism. Just as the latest innovative technologies are deeply integrated into almost all sectors of the modern economy, so the IT educational sector, as an integral part of this integration process, corresponds to its general trend – the significant dynamics of changes that are currently observed (is a characteristic feature) in the development of the IT sector, which causes the transformation of the composition, structure and content of the relevant subject area of knowledge – information and communication technologies.

Thus, rapid changes in society, constant and rapid changes and updates in the field of information and computer technologies put forward, in turn, increasingly higher educational requirements for the specifics of professional IT training in certain profiles of professional specialization. Such requirements of the IT industry – the information technology market as a type of economic activity are extremely important for the implementation of academic standards in the relevant area of educational activity, and the training of qualified personnel for this strategically important sector is the main task.

It is known that Great Britain is a recognized leader among world countries with the leading development of a modern innovative economy, focused on the creation, development and qualitative improvement of the latest technologies, integrated into a single world space, where the information and computer technology industry is of primary importance for national growth and well-being.

It should be noted that the implementation of fundamental educational reforms at the national level, which took place in Great Britain simultaneously with the processes of globalization and intensification of market relations in all spheres of human life, led to a change in the priorities of the development of the educational sector in the country: the defining task of state education was to improve the quality of educational services, due to the need to ensure the competitiveness of the state in modern conditions of global economic, social political and cultural integration.

Currently, the modern British model of higher education is considered a typical example of the Bologna educational system, the main features of which are: the orientation of higher education institutions to the needs of the labor market, close connection to the business community, active research activities, state control mediated by specialized agencies, etc. (*Manelyuk, 2019*). Such a model is provided at the state level by a unified base of professional qualification standards, which preserves all current National Occupational Standards of the UK (*NOS*), and is one of the elements of the system for ensuring the quality of training of specialists in various specialties in various sectors of the economy and determines the foundations of the functioning of professional activity in the country.

Therefore, the purpose and main objectives of the current publication are to study and analyze the features of standardization of professional training of specialists in computer specialties in British universities, which ensure interaction between the professional sphere and the sphere of education and directly affect the level of quality of training of future IT specialists. The task is also to characterize the terminological field of study of the issue related to the British experience of standardization in the IT industry, that makes it possible to review the features of this experience as an effective regulator of the quality of IT education. The use of systematic analysis and synthesis of scientific provisions of specialized literature, comparison of regulatory documents and standards of British higher education contributed to the clarification of the state of research of the outlined issues and the systematization of theoretical findings on the topic of the publication.

2. Terminological field of standardization research in IT education

We agree with the statement that «in a relatively short period of time the field of information technology has transformed from an ordinary, sometimes minor industry into one of the main drivers of the global economy, becoming catalyst for tectonic changes transformation in many other industries» (*Development of the Ukrainian IT industry, 2018: 4*).

The long-term interests of our state lie in the formation of a modern innovation-type economy, focused on the creation, development and qualitative improvement of the latest technologies and integrated into a common international space. The process of Ukraine's integration into this space also provides for the adaptation of the national higher education system to European requirements in accordance with the provisions of the Bologna process and pose new challenges in terms of improving the professional training of domestic specialists in the field of information technology in accordance with global IT quality standards.

Grounding of new conceptual approaches related to ensuring high-quality professional IT training at the level of higher education in Ukraine requires a comprehensive analysis of modern requirements and trends in the formation of the content of professional education, not only based on national achievements and developments, but also taking into account the progressive experience of leading countries in the world space. Globalization processes taking place in modern society create significant opportunities for the exchange of such experience and facilitate access to advanced educational and scientific technologies. In this regard, the positive experience of standardizing the professional training of computer specialists in British higher education institutions in the context of the modern British model of the higher education system is of considerable scientific and applied value for our country.

Therefore, let us analyze the study terminological field of the issue of British experience as for standardization in the IT industry, whose main concepts and categories disclosure will contribute to a deeper understanding of the content of the research problem. The key concept of the publication is the concept of «information technology», whose definition features are associated with its inherent multidimensional semantic load.

On the one hand, this concept is used to denote the general set of the latest innovative achievements made in the field of information technology at a certain point in time, on the other hand, it defines the field of information technology as a type of technical, innovative, educational and scientific activity that develops information industry technologies, and, at the same time, is a designation of the corresponding technological processes, the main product of which is information (*Pivniak et al., 2010*).

Accordingly, the term «IT education» (or «education in the field of information and communication technologies») is understood as the entire necessary range of educational services provided by the relevant sector of the higher education system, intended for the training of IT personnel (*Morozova, 2010*). For its part, the key conceptual center of the formulation of the term «IT education» is the concept of «professional training», thus, the main goal and objective of higher IT education is the implementation of professional training of applicants – future specialists in information technologies, which involves their acquisition of certain theoretical and practical knowledge, skills and abilities, competencies necessary for further professional activity in the specialty in the IT field.

The specialties in which IT specialists are trained, the content of this training are reviewed in accordance with the needs of the labor market, scientific and technological progress, international training standards, that necessitates the use of the latest approaches to training future IT specialists to improve their professional level (*Sikora, 2023*).

The term «educational standard» is interpreted as educational content formed on the basis of a competency-based approach (an approach based on the definition of learning outcomes) in accordance with the requirements of the National Qualifications Framework (a regulatory document that defines learning outcomes expressed in terms of competencies for of certain levels) and the labor market. Regulatory requirements for the competence, qualifications and functional responsibilities of employees, that are determined by employers and serve as the basis for the formation of professional qualifications, are traditionally articulated in the format of professional standards. The structure and content of professional standards outline the typology and objects of professional activity, as well as the range of tasks that are solved in the process of its implementation.

Therefore, the standardization of training is provided by professional standards as an effective tool that ensures interaction between the professional sphere and the sphere of education, as well as personnel management. Professional standards differ by industry, which includes the IT industry, and provide the education sector, namely the relevant educational institutions, with the necessary information about the areas and objects professional activity, their types and professional tasks, and the necessary competencies of future specialists. In other words, professional standards reflect the formalized requirements of employers for future specialists, and educational standards determine the content of education, which is formed on the basis of the competency approach and the requirements of the National Qualifications Framework and employers as representatives of the labor market. Thus, clarifying the main terms of the study, such as: information technology, IT education, professional training, educational and professional standard, contributes to a better understanding of the features of the British experience of standardization in the IT industry, namely, the features of standardization of professional training of computer specialists in higher education institutions in Great Britain, as well as the issue of coordinating professional and educational standards as tools for effective quality management of higher IT education.

3. Features of the British experience of standardization as an effective regulator of the IT education quality

The main task of higher education, as is known, is to ensure high-quality educational training of applicants, which is implemented under the conditions of creating an effective system of higher education. The integration of our country into the all-European economic and scientific space perceives its development in the context of a common European educational strategy in accordance with the requirements of Bologna Agreement and the resource of world experience, which corresponds to the level and conditions of international educational standardization, which provides for the advanced development of the national system of higher education and requires continuous development of the professional skills of a specialist.

As already mentioned, in Great Britain, the quality assurance system for training specialists in various specialties covers a wide range of sectors, among which the information and computer technology sector occupies an important place, and includes the following regulatory components that ensure the coordination of professional and educational standards as a mechanism for effective management of the quality of education, in particular IT education:

– The Higher Education and Research Act (2017) is one of the most important legal documents that regulates the process of professional training of specialists in all fields in higher education institutions in the UK. Its content reflects reforms and current trends in the development of British higher education system (*Education in the UK. Higher Education and Research Act 2017*);

– Sector Skills Councils (SSC) is a network of key independent bodies of professional public management of the system for providing training of specialists, which include representatives of employers, the state and education specialists who take an active part in the development of national educational standards covering all sectors of the British economy. For example, the information technology and telecommunications sector – the area of responsibility of the Sector Skills Council that represents digital skills or «e-skills» (*Skills for business*);

– Quality Assurance Agency for Higher Education (QAA) is a national independent body under whose banner the British education standards are developed and maintained (*Quality Assurance Agency for Higher Education. About us*). The Agency develops a unified UK Quality Code for Higher Education – a key reference point that provides educational institutions with instructions on benchmark mandatory expectations and methods for the quality and standards of education. The Quality Code is a starting point for higher education institutions to create and maintain their own educational programs, which are developed in accordance with national qualification standards in a wide range of professions, also including the IT sector (*Quality Assurance Agency for Higher Education. Quality Code*);

– The Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (FHEQ) is a formal component of the UK Quality Code for Higher Education, one of the main regulatory documents that formulates the fundamental principles of the quality of higher education in Great Britain. It establishes standards, namely the different levels of higher education qualifications and the requirements for each of them, and regulates the objectives and learning outcomes at each of its stages (*Quality Assurance Agency for Higher Education (QAA). UK Quality Code*);

– QAA Subject Benchmark Statements is a fundamental document containing requirements for the content of educational programs in areas of training in a certain subject area of knowledge (*Quality Assurance Agency for Higher Education. Subject Benchmark Statements*), in particular, for the development of IT programs, the role of the educational standard is performed by the QAA Subject Benchmark Statements for Computing 2022 (*Quality Assurance Agency for Higher Education. Subject Benchmark Statements: Computing*);

– international standards for typical bachelor's and master's degree programs, which are developed in the form of curriculum standards. The following standard called Computing Curricula 2020 – CC 2020: Paradigms for Global Computing Education (*Computing Curricula (CC2020)*) is in effect in computer education.

Therefore, identifying the features of standardization of IT specialists training provides realization of the key idea, which is that British professional standards contain guidelines that determine the development of IT educational and professional activity as an integrated system. As a result, such synergy contributes to the high-quality training of future IT professionals, their competitiveness in both the national and international labor markets, as well as high professional implementation, which ensures sustainable economic progress. And it is in the IT industry that this progress is the object of special attention, given its variability and dynamism, when outdated knowledge in a certain subject area loses its relevance and requires timely updating.

4. Conclusions

Significant changes that have occurred in the field of information and communication technologies over the past decades have led to the awareness of the formation of an integrated harmonized approach to the training of competent specialists, primary in such a dynamic and changing industry as the modern IT industry. The article demonstrates how the norms of the

educational standard, that function in close interaction with professional standards, and the full coordination of qualification requirements for future IT specialists, allow for an effective influence on the quality of their academic training and further professional implementations.

So, using the British example of studying the current experience, which concerns the features of standardization of professional training of computer specialists in higher education institutions of Great Britain, it becomes clear that in this country the construction of an effective system of reproduction of highly qualified personnel for the rapid development of the IT industry is perceived as a critically important task, the successful solution of which depends on the development of the British IT industry, and – in a broader sense – the country's economy at the national level. Undoubtedly, Great Britain serves as an authoritative model, whose own experience represents considerable scientific and applied value for our country.

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