INFORMATION SUPPORT FOR FORECASTING THE DEVELOPMENT OF TRAINING IN THE HIGHER EDUCATION SYSTEM

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ABSTRACT

The article is devoted to the study of the peculiarities of information support as an important aspect of forecasting the development of training in the higher education system. In the course of the study, the information bases of forecasting, the specifics of the application of information in the course of forecasting, practical recommendations for the development of adequate forecasts of eligible reliability are given. According to the results of the research, the main stages of the formation of information support for forecasting the development of training in the higher education system are identified.

Keywords: Forecasting, information support, development of higher education, training of personnel, higher educational institutions.

INTRODUCTION

A comprehensive analysis of the stage of independent development passed by the Republic of Uzbekistan, as well as the changing conjuncture of the world economy in the context of globalization require the development and implementation of radically new ideas and principles for the further sustainable and advanced development of the country. In this regard, in accordance with the Strategy for Action in the five priority areas of development of the Republic of Uzbekistan in 2017–2021, the most important principles for a radical increase in the effectiveness of the reforms, creation of conditions for ensuring comprehensive and accelerated development of the state, modernization of the country and liberalization of all spheres of life were determined [1].

At its core, the Strategy of Action marked a qualitatively new approach to the system of strategic planning of the prospects for state and social development of the country, the direction of state policy in the field of science and education, as well as a system of measures stimulating scientific, educational and scientific and technical activities. The effectiveness of the implementation of these actions in the educational aspect largely depends on the information base and the prerequisites for forecasting the development of personnel training in the higher education system.

On the eve of the new century, there is unprecedented demand and greater diversification in higher education, as well as a growing awareness of its vital importance for socio-cultural and economic development and for building a future for which the younger generations will have to be equipped with new skills, knowledge and ideals. Higher education includes "all types of education, training or preparation for research at the post-secondary education level, provided by universities or other educational institutions that are approved by competent state bodies as higher educational institutions". Everywhere higher education faces serious problems and difficulties related to funding, equality of conditions for access to studies and training,

improving staff skills, skills-based training, improving and maintaining quality in training, research and services, relevance of the program, employment opportunities for graduates , the conclusion of effective cooperation agreements and equitable access to the benefits of international cooperation. At the same time, higher education is confronted with new opportunities associated with technologies that improve the ways of production, management, distribution, access and control of knowledge. Equitable access to these technologies must be ensured at all levels of education systems [2].

INFORMATION BASIS FOR FORECASTING

The analysis of the scientific literature on the problem under study shows that the object of forecasting should be information obtained using primary and secondary data (primary and secondary information) [3].
T
he primary indicators of forecasting include indicators of the annual analysis of the activities of higher educational institutions, scientific organizations, technological and design organizations, and industrial sectors. In the field of education and research in higher educational institutions, the scorecard, as a rule, reflects:
• organizational and educational structure for the development of higher education;
• the number, composition and movement of the contingent of students and teaching staff;
• scientific training;
• material and technical base of education, etc.

Primary data is obtained as a result of scientific research, statistical and economic developments, experimental work. They are usually analyzed for the preparation of common solutions.

Secondary data is used in conducting relevant tests, that is, obtaining information necessary for forecasting and planning, sources of which are departmental, financial, statistical and other reports and the development of educational organizations at all levels of management structures and higher educational institutions. Internal sources can also be reports of heads of higher educational institutions, minutes of department meetings, decisions and proposals of scientific conferences, methodological seminars, round tables, etc. [4].

Secondary information from the external environment is quite diverse and, as a rule, scattered in many sources, which are completely impossible to enumerate. Many international and republican organizations regularly publish this type of data, useful in analyzing forecasting. External sources also include data from international organizations, laws, decrees, resolutions of state bodies, speeches of state, political and educational figures, official statistics, publications of scientific symposia and conferences [5].

In the process of forecasting when determining the sources of secondary information, it is advisable to carry out the following procedures:
• establish what information is already available and still needed;
• make a list of key terms and names that determine the content of sources of secondary information;
• search for secondary sources of information, starting with print catalogs and computer networks.

If the information does not meet the requirements of forecasting, then it is necessary to clarify the sources of its formation, more strictly approach the selection and analysis of the necessary data [6].

External information can be divided into officially published, accessible to all, and the so-called primary information, which is specially collected and processed.
Methods of obtaining secondary information are based primarily on the analysis of documents. Practically there are two types of analysis:
• traditional (classic);
• formalized.

Despite the distinctive features of the types of analysis, they do not exclude the mutual addition to each other.

In the process of forecasting, the so-called traditional analysis remains in the foreground. In content, it is a chain of logical constructions aimed at the manifestation of the essence of the material, which is analyzed in the field of education. Based on practice, it should be borne in mind that the information that is necessary for forecasting is often fully consistent with the objectives of specific studies. Therefore, when conducting a traditional analysis, it is necessary to take into account the main goal of the document being analyzed, its reliability [7].

The formation of the information base for creating a forecast of the development of the training process in higher education should be based on the following basic principles:
• the process of forecasting the indicators of the scientific, educational and technical innovation sphere should be considered as a complete system of interrelated and coordinated characteristics of scientific, educational and technical innovation activities;
• when developing forecasts, alternative development paths that differ in goals, objectives and resource support are analyzed;
• The forecasts assume the use of models that take into account both existing and future trends in the development of science, education, technology (including possible deviations);
• in the formation of the selection of data for the forecast calculation and the adaptive system of forecasting models, the active role of individuals (management structures) who make decisions [8] should be taken into account.

The choice and implementation of a forecasting model for the development of the training process in higher education is determined by the peculiarities of current and subsequent tasks, as well as by the specific information that is formed under the influence of real events and a group of factors. These include:
• the implications of global developments in science, education, technology (meaning the impact on the spheres of scientific, educational and innovation-technological activities of higher educational institutions, due to the pace of development of the world economy and changes in the political environment);
• taking into account in forecasting information reflecting the needs of the economic and political situation inside the country and the dependence of the scientific and educational spheres on it, the need to predict quantitative and qualitative indicators of the dynamics of the development of higher education;
• the construction of forecast calculations for the education sector should be based on information that concentrates data from external and internal factors relating to this problem [9].

APPLICATION OF INFORMATION IN FORECASTING

The forecast of the development of the scientific and educational sphere based on traditional methods of extrapolating existing trends is possible only in the inertial scenario of the development of the economic situation, and this is quite conditional, due to the insufficient depth of the retrospective of individual indicators. The instability of the economic situation in the world, the dynamics of market relations, structural transformations and transformations in the country, the innovative nature of the reforms make it impossible to fully use state statistical reporting.

In this regard, specialists engaged in the development of forecasts in the field of higher education should take into account that the introduction of traditional analysis includes two aspects - external and internal. External analysis takes into account the study of the context of documents that are associated with numerous legal entities, including higher educational institutions. Internal analysis is aimed at taking into account the information data of educational structures of vertical subordination. Some documents and materials (including statistical) require special methods of analysis.

In the process of preparing forecasting decisions in the field of education, scientific methods should be applied to obtain, as noted above, first the primary information. They can be classified as quantitative and qualitative. As for quantitative research, they, as a rule, are identified with measurements, the use of directional information of higher educational institutions, annual and quarterly reports of universities, departments, research divisions. Characteristic features of such an analysis is a clear definition of data and sources of their receipt, processing of the collected data using ordered quantitative procedures. Qualitative studies of predictive processes include the collection, analysis and interpretation of data on the functioning of higher educational institutions by observing and studying the work of pedagogical research teams. Qualitative and generalized conclusions, expert assessments are often the source of promising ideas. The qualitative methods include analysis of the minutes of meetings of academic councils of educational institutions, departments, research departments, as well as expert methods [10, 11].

The primary information necessary for the preparation of forecasting documents should also include the survey method in the form of answers to the questions posed. The survey can be structured and unstructured, depending on the departments of the higher school, those teams, scientists and specialists who can add their thoughts and experience necessary when preparing the forecasting process. The advantage of this method is:
• standardization, due to the fact that all respondents are asked the same questions;
• acceleration of operations, since direct contact with respondents is not necessary, a survey can be conducted over the network using the Internet, etc.;
• the possibility of in-depth analysis due to the use of consistently clarifying questions;
• the ability to perform statistical analysis using mathematical methods and appropriate programs for personal computers [11].

Information from respondents during the survey may be collected using three main methods:
• the interviewer records the answers to the questions asked independently;
• questions are asked using a computer;
• by self-filling in questionnaires by respondents [12].

In the theory of forecasting, the method of repeated and selective questioning with respect to given parameters on the same sample is called, as is known, the panel method of research.

Members of the panel can be organizations, divisions of higher educational institutions, experts, scientists who remain permanent. The panel survey method has advantages over conventional one-time surveys, since it makes it possible to compare the results of subsequent surveys with the results of previous ones and to establish trends and patterns in the development of higher school processes. All types of panels it is advisable to determine during the lifetime:
• short-term - that exist up to a year;
• long-term - which exist no more than five years.

Long-term panels can provide continuous or periodic information, which after statistical processing should be subjected to a thorough analysis.

In the process of forecasting information support, great attention should be paid to the validity and accuracy of statistical estimates. After all, the results obtained during the statistical processing of data may vary in the degree of accuracy and reliability of validity. Forecasts can be based on statistical estimates, if their reliability and accuracy are determined. Without such a justification, forecasts are not credible. The degree of validity and accuracy of the results depends on the amount, nature of the data, the method of their processing, the level of compliance of educational processes in the vertical and horizontal dimensions [13].

In order to develop adequate forecasts that meet the requirements of reliability, it is advisable to adhere to the following practical recommendations:
• use, for example, non-parametric correlation analysis, which is used to identify and evaluate the relationship between various indicators characterizing educational systems [1, 12];
• it is important to solve the practical problems of forecasting, the experimental data reflect taking into account dependent variables and independent variables;
• an important place in the forecasting process is forecasting the dynamics of the time series, which is a set of consecutive measurements of the indicator, carried out at equal intervals of time;
• expert assessment methods should be applied under conditions of some uncertainty, which arises due to insufficient information from educational structures. At the same time, the reliability of the estimates obtained depends on the number, competence of experts;
• application of the method of collective generation of ideas allows to obtain a large number of constructive ideas. Experts should be individuals with relevant experience combined with a developed creative mindset so that qualified analysis can be carried out [3, 9].

On the basis of the analysis of the scientific literature on the problem under study, it is considered appropriate to identify a number of factors affecting the change in the nature of the development of the educational system:
• realization of the achievements of scientific and technical progress, occurs in time and space and cannot be viewed in isolation, without communication with the processes of development of the higher education system;
• implementation of structural and substantive reforms that meet the needs of society, the individual provides for improving the quality of vocational training, strengthening the individual approach, developing creative abilities, creating a stable life position for future specialists, strengthening ties with functioning production;
• improving the regulatory, educational and scientific support of the higher education system;
• qualitative update with modern technology and material and technical base of the higher education system;

• consideration of factors related to the general socio-economic situation in society, anticipation of changes in the regulatory framework, the development of ties with the global educational space and a number of other conditions that may affect the final result [8, 11].

The quality of their forecasting depends on the completeness of taking these factors into account in the modeling of educational processes. Depending on the nature of the process, the goals of forecasting, the class of forecast models is selected. At the same time, the forecasting of educational processes is impossible without consideration of the essence of the predictive system and its structural elements. Under the predicted system, it is advisable to understand the totality of methods, techniques and procedures that allow to obtain forecasts for a given target function of the development of the object of forecasting, for a given amount of predictive information. The prediction system includes two main operations:
• formation of alternatives for forecasting objects;
• comparison and selection of alternatives.

The combination of these operations determines the complex problem of system forecasting, the means of solving which is the predictive system. The following basic principles are implemented in predictive systems:
• interrelation and subordination of forecasts of various levels of the hierarchy of forecasting objects, the external environment, various aspects of the study of forecasting objects;
• consistency of regulatory and research forecasts;
• continuity of the forecasting process, requires adjustment of forecasts as new information becomes available [14].

CONCLUSION

The study allows us to identify a number of main stages in the formation of information support for forecasting the development of training in higher education.
Thus, in the framework of the first stage, the prediction of the values of total domestic needs and the sources of satisfaction of these needs should be carried out. In addition, it is necessary to prepare informational data that would make it possible to predict the amount of funds coming from various sources in order to meet the needs of developing training in higher education.

Within the framework of the second stage, it is advisable to prepare an information base for calculating the number of personnel of a higher educational institution, which should be based on a number of parameters:
• determination of socio-economic factors influencing the formation and development of the personnel potential of a higher educational institution;
• analysis and determination of trends in the development of the educational staff of a higher educational institution in terms of its compliance with market conditions;
• development of a model for the development of personnel potential of the higher education system in the future;
• making predictive calculations of the development dynamics of the student, scientific and technical staff of a higher educational institution;
• development of a mechanism, the introduction of which could effectively affect the formation of the optimal structure of the staff of a higher educational institution.
In the framework of the third stage, it is advisable to prepare informational data on the basis of which a forecast is developed for the development of the material and technical base of a higher educational institution in the prospective period. It is necessary to take as a basis forecasts of the value of internal costs, including the share attributable to the purchase of equipment,

computer equipment, equipment of classrooms and laboratories, the purchase of textbooks, and current capital expenditures.

As part of the final stage, an information base is being prepared to ensure the prediction of the effectiveness of scientific research based on the developed and approved programs.

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