ANALYSIS OF PEDAGOGICAL CONDITIONS FOR STRENGTHENING THE INTEGRATION OF EDUCATION, SCIENCE AND PRODUCTION IN THE CONDITIONS OF REGIONAL HIGHER EDUCATION INSTITUTIONS

Sayfullaeva Nigora Zakiralievna
Postgraduate student of the Department of Pedagogy, Bukhara State Pedagogical University, **UZBEKISTAN**
E-mail: nigora-sayfullaeva@mail.ru

ABSTRACT

The article provides an analysis of the main reasons for the weak integration of education, science and production - one of the pressing problems of today in the context of the pedagogical activities of regional universities. In the course of the analysis, the author reveals the causal relationships of the occurrence of the prevailing conditions of the pedagogical activity of universities, cites historical parallels correlating with the identified problems, and also cites statistical data obtained on the basis of the conducted questionnaire. To solve the identified problems, the author suggests methods that contribute both to improving the efficiency of the pedagogical activities of universities, and to enhancing the integration of education, science and industry.

Keywords: Integration, ICT, educational paradigm, educational matrix, educational burden, teaching methods, Concept of national systems of innovation.

INTRODUCTION

Integration of education, science and production is the process of merging educational programs, scientific developments and their commercialization in the form of finished scientific products or technologies through venture investment or creating conditions for the development of small business by the efforts of universities or with their direct participation [6, p. 119].

Science influences production and technology not only through the generation of ideas, but also through other channels - through the economy, organization, etc. In the formation of a culture of high-tech production based on knowledge, an important place belongs to education, since in modern production of high complexity it becomes obvious that the more qualified a worker is, the higher his general culture and the quality of his work [11].

The integration process is considered mainly from the point of view of the formation of legal, technical and economic prerequisites and conditions for interaction between the research activities of universities, applied developments and production activities directly. Here, it seems to us, the dominant link is the research activities of universities as the initial stage in the formation of scientific developments, innovations and applied research. Therefore, the sources of weak integration between the three key components should be sought precisely in the flaws in the pedagogical activities of universities, especially regional universities of a technical and economic profile, as the main supplier of engineering personnel.

Historically, the research university has established itself as the most successful form of integration of education and science. Within the walls of the campuses there are both lecture

halls, where students receive theoretical material, and laboratories, in which research activities take place directly. Thanks to this, an integrated information exchange is carried out not only between students, but also between students, teachers and scientists. The concept of a research university was based on the fact that the acquisition of contextual knowledge should take place at the university itself in parallel with the acquisition of formal, codified knowledge, which are contained in textbooks [6, p. 119].

But this concept applies to the activities of foreign universities, while in the practice of domestic universities the situation is somewhat different. The main reasons for the lack of a well-functioning mechanism for the formation of the educational process, which expediently combine cognitive, practical and research activities, in our opinion, are as follows.

First, there is a significant discrepancy between the nominal, or, in other words, the officially established goals of pedagogical and research activities and the actually existing objective goals and conditions of the cognitive process.

The gap in the target settings of this category is due to the ingrained paradigm of the dominance of the demonstration of indicators of the effective activity of the university, and not the actual results of its work. But, as they say, "to have a reputation" does not mean "to be such." This paradigm affects almost all components of the pedagogical process: students strive not to gain knowledge and skills as criteria for actual qualifications, but only to high assessment results, teachers strive to display the results of their work as clearly as possible, while their main purpose is formation of competitive competencies in future personnel. The same applies to the research activities of the university - the very fact of the availability of grants, business contracts focused on the implementation of research projects for the production sector by the university is often more important than the successful commercialization of research results or the practical implementation of innovative developments.

Secondly, the diverse content of teaching activities does not allow them to concentrate their efforts on the implementation of all the assigned pedagogical tasks. The same trend applies to student activities. As a result, both students and teachers, being the main components of the pedagogical process, scatter their energies, trying to form a system of knowledge based on subjects of a diverse nature. Within the framework of the established educational paradigm, the result of the educational process in the minds of students is the so-called educational matrix, formed according to the principle of honeycomb. Each cell of this matrix is a framework formed from subject knowledge. In the process of further practical activity, these cognitive cells, like honeycombs with honey, are filled with specific content, and only then knowledge is transformed into specific skills and abilities. If this subject knowledge is not embodied in practical activity, then, ultimately, society will receive certified specialists, potentially capable of competent activity in the profile in which they studied, but in fact not ready for professional activity. This is confirmed by the ironic statement of one of the graduates in response to a question about his professional suitability: “Do you know what my education can be compared to? I know all varieties of rice, all types of meat, growing conditions and varieties of carrots, the process of obtaining oil, properties of onions - but I will not be able to cook pilaf ... ”.

The educational paradigm during the period of industrial society was formed under the influence of the development of industry and the productive forces of society. The industry needed specialists with a set of specialized knowledge. When a university graduate became an integral part of the educational, industrial, research and other spheres of society, the mechanism of “filling honeycombs with honey” proceeded smoothly, since the content of the subjects

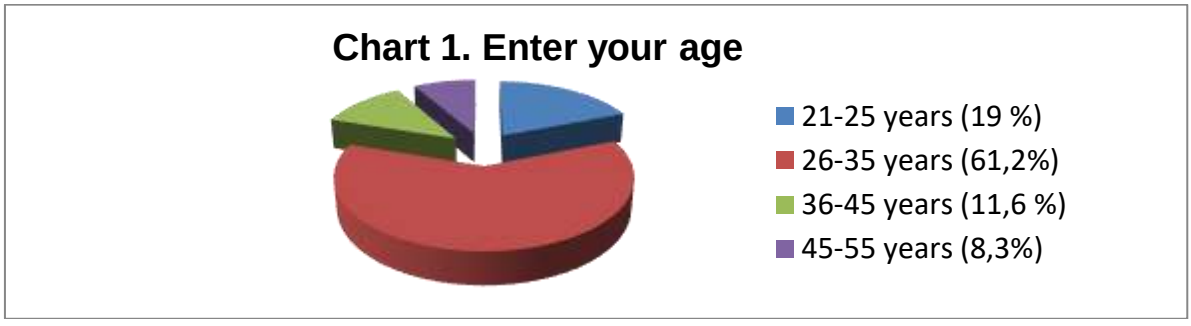
learned by him at the university corresponded to the level of development of the productive forces of society. At the present stage of socio-economic development of society, a sharp acceleration of scientific and technological progress, which entailed the informatization of all spheres of activity, has led to an increase in the gap between the educational and methodological content of the disciplines studied and the actual working conditions. Universities are far from always capable of quickly and flexibly rebuilding the components of the educational process in order to adapt to the rapidly changing conditions of social development. In this regard, graduates who have embarked on their professional duties in a new workplace face two types of problems: either they have to work on the latest equipment, about which they have not received any information at the university, or, having studied the latest methods of analysis or development at the university. , mainly from foreign literature, they cannot apply them anywhere, since the degree of development of their enterprise does not correspond to this level.

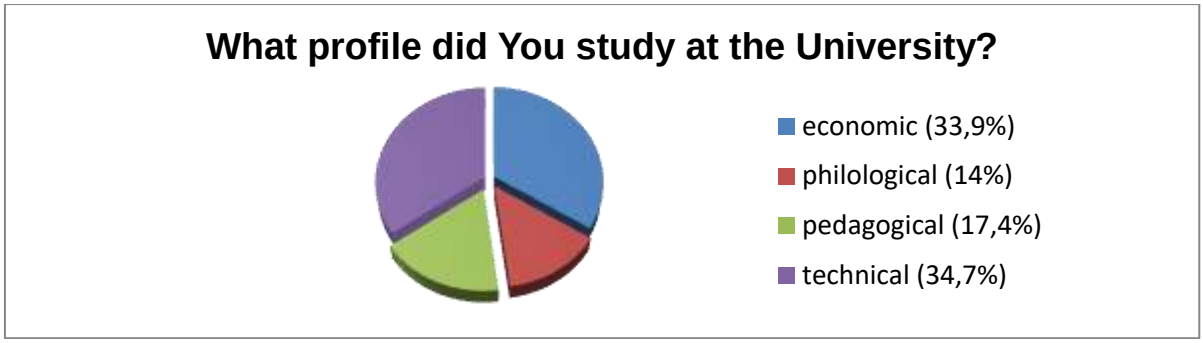
In order to study the situation objectively existing today in the field of employment, adaptation and the level of professional preparedness of specialists, with the assistance of the @potrebitel_bukhara community, a social survey of the opinions of university graduates was carried out within the framework of the Telegram social network.

In order to obtain reliable information, the survey was carried out anonymously. 121 people took part in the survey, the sample of respondents was made randomly. The main findings of the survey are shown in the diagrams.

Materials and methods

As can be seen from the following diagrams, the bulk of the respondents are young people aged 26 to 35 with a technical or economic education. 57% of respondents do not work in the specialty in which they studied at the university, some of them - 6.5% - do not work at all. Only 17.4% of the respondents indicated that the amount of knowledge received at the university was sufficient for them to fulfill their official duties at the workplace, and 38.8% indicated that there were not enough practical skills. Three quarters of the respondents are involved in production, trade and services. And the most important conclusion is that 57% of respondents, when asked what needs to be changed in the process of studying at a university in order to improve learning outcomes, insisted that more time should be devoted to practice.




What profile did You study at the University?
economic (33,9%)
philological (14%)
pedagogical (17,4%)
technical (34,7%)

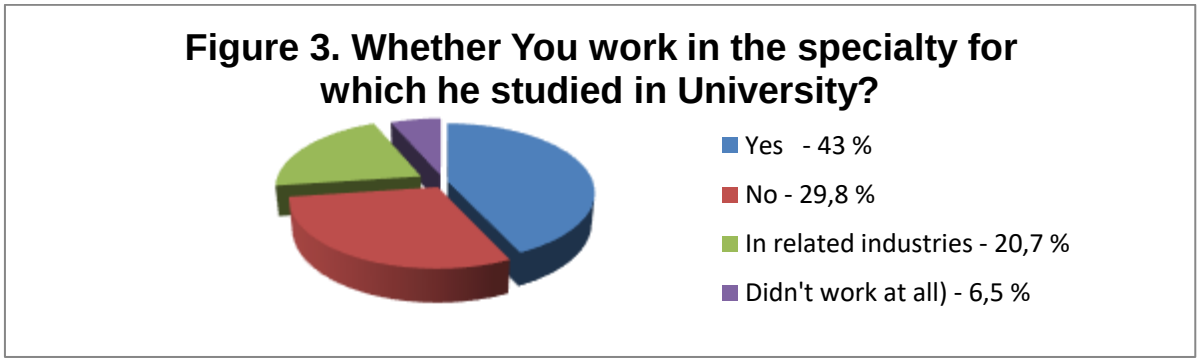


Figure 3. Whether You work in the specialty for which he studied in University?
Yes - 43 %
No - 29,8 %
In related industries - 20,7 %
Didn't work at all) - 6,5 %

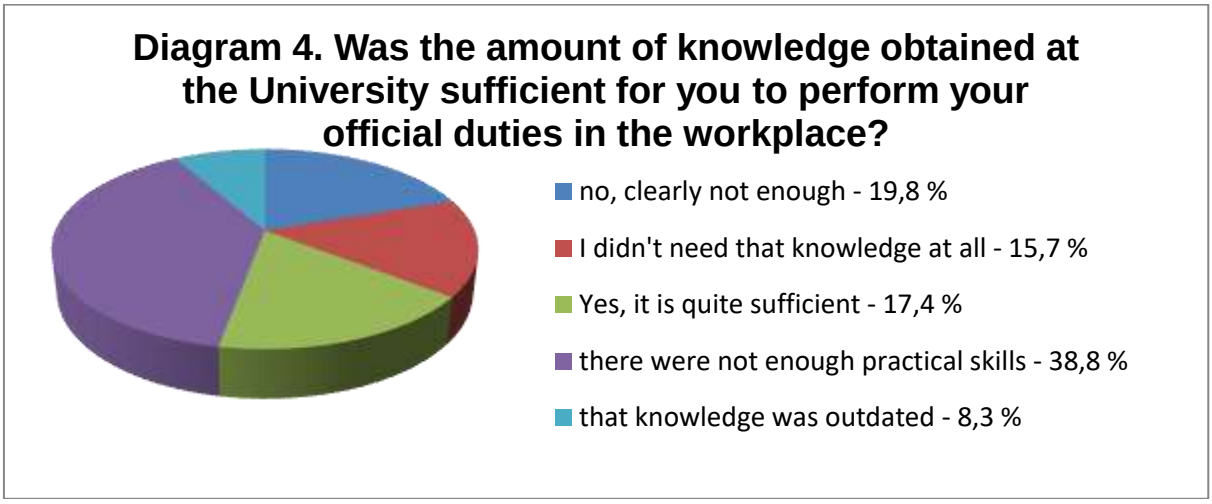


Diagram 4. Was the amount of knowledge obtained at the University sufficient for you to perform your official duties in the workplace?
no, clearly not enough - 19,8 %
I didn't need that knowledge at all - 15,7 %
Yes, it is quite sufficient - 17,4 %
there were not enough practical skills - 38,8 %
that knowledge was outdated - 8,3 %

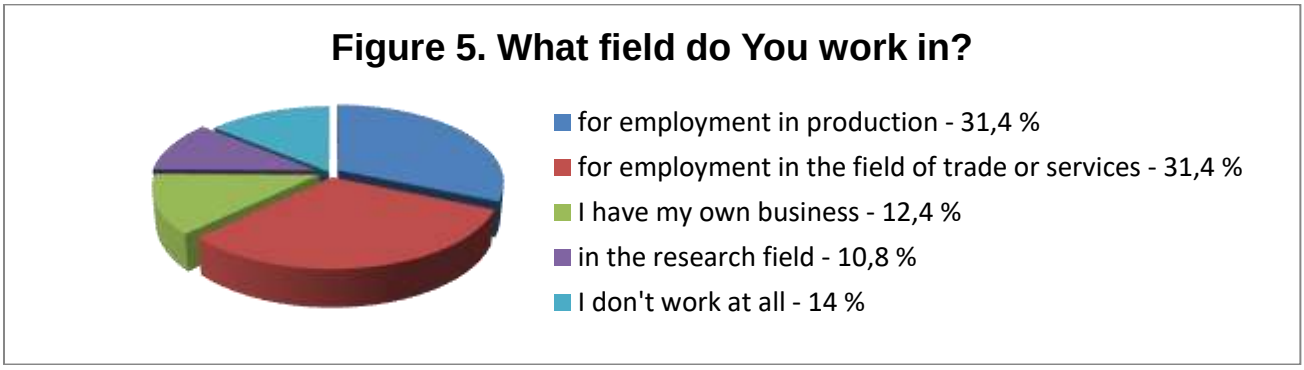
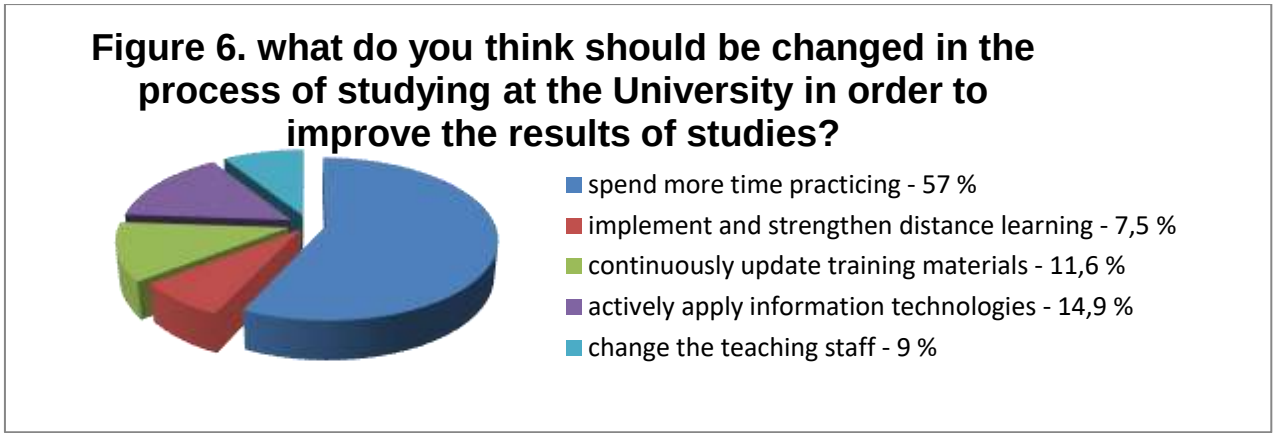


Figure 5. What field do You work in?
for employment in production - 31,4 %
for employment in the field of trade or services - 31,4 %
I have my own business - 12,4 %
in the research field - 10,8 %
I don't work at all - 14 %



Professor of Economics at Harvard University N. Gregory Mankiw argues: “The basic rule of tax burden distribution is that most of the tax burden falls on the less elastic side of the market. Elasticity determines the willingness of buyers or sellers to leave the market in the event of deterioration in the prevailing conditions. Low elasticity of demand means that buyers do not have an acceptable alternative to a particular product. Low supply elasticity means sellers lack more attractive production options. When a product is taxed, the party with fewer choices is unable to leave the market and must, therefore, bear most of the tax burden” [5, p. 160-161].

A similar mechanism is inherent in the distribution of the so-called “pedagogical burden” between teachers and students.

In the article by V.V Laptev and T.N. it says: "Revealing the concept of" ICT - tools of the teacher's professional activity ", we are based on the fact that the most important goals and objectives of informatization of pedagogical activity is to launch a new course of the educational process. Its characteristic features are a high degree of educational freedom, independence, self-government provided to the student [3].

One cannot but agree with this statement, however, its reliability is confirmed only with a high degree of readiness of students for independent cognitive activity and the development of research skills on its basis. In the event that students do not possess these qualities, the learning process, despite the high level of technical equipment, continues to be reproductive, when the teacher is assigned the role of a translator of knowledge, and the students master the finished material. In this case, with the predominance of classroom studies, the "pedagogical burden" is shifted mainly onto the shoulders of teachers, who are sometimes forced to acquire the features of a showman, trying in every possible way to attract and retain the attention of students, who, in turn, have many opportunities to ignore the teacher - the presence of smartphones with access to the worldwide network allows them to watch films, videos on a smartphone monitor, go to social networks, exchange information during the lesson. Even the use of advanced educational technologies cannot always successfully compete with the virtual reality in which students are immersed.

A diametrically opposite situation develops when students study remotely, that is, communication between students and teachers is predominantly virtual. In the event that all elements of students' educational activities are not thoroughly worked out, to the smallest detail, in the methodological and methodological aspects, the "pedagogical burden" is borne directly by the students themselves, since the timely fulfillment of all the instructions may turn out to be an unbearable burden for them.

This is confirmed by an excerpt from the article by Noskovoy T. N., PavlovaT. B., Yakovlevoy V., where statistics are given: “68% of Russian teachers offer students assessment criteria, requirements for completing assignments, but they implement this without using special software tools that make it possible to make management resources clear, visual, and aesthetic.

Network questionnaire is actively used, but not by means of mobile technologies” [7, p. 39].
In order to avoid such extreme situations in the distribution of the "pedagogical burden", it would be advisable to determine the optimal ratio between classroom lessons and the implementation of educational activities outside the classroom. The optimal ratio can be determined empirically through a series of experimental sessions.

The development and complication of socio-economic relations goes hand in hand with the evolution of institutions. An axiom is the fact that ignoring the role and significance of institutions and institutional changes, the incompatibility of the proposed measures to reform the hierarchy of institutions prevailing in society, initially doom the reforms to failure [8, p. 98-100].

Developed countries have a market constitution, so it makes sense for us to adapt the experience of foreign countries in the system of personnel training to the conditions prevailing in our country.

Work on strengthening the material and technical base of educational institutions, improving the material support of teachers is being actively and on a large scale. However, the basic principle of the functioning of a market economy is not fully used in our personnel training system. This principle is the division of labor, as a result of which a clear specialization of labor is formed. Teachers at all levels of the educational process work simultaneously in several areas of educational work, dissipating their strength and not being able to focus on something specific. Teachers simultaneously develop curricula, prepare materials for lectures and practical classes, conduct classes in the classroom, do extracurricular activities, work on scientific articles, etc. Thus, the indicators of the implementation of the educational process are obvious, but the quality of education does not meet international standards. In developed countries, teachers conduct classes with materials carefully prepared by a specially created group of scientists who have a deep and comprehensive knowledge of subjects and specialize in the development of educational and methodological support of the educational process.

In addition, a clear formal differentiation of academic disciplines into certain subjects is not entirely correct, in fact, it is often difficult to determine where the field of study of one subject ends and the area of knowledge of another begins.

Therefore, we consider it expedient: firstly, to create special analytical groups working on the development of educational and methodological support for the lesson, and secondly, to change the structure of the educational process, combining subjects into educational blocks for solving problem situations by students, isolated from our real life in as a learning task and goal.

As a result of these transformations, teachers will have the opportunity to focus on improving the quality of the lesson and improving teaching skills. The division of labor will allow each participant in the educational process to maximize the usefulness of their activities, and the synergistic effect of their interaction will significantly improve the quality of training of human resources in the future [9, p. 20-21].

Thirdly, the prevalence of classroom studies with the study of theoretical material and the lack of practical activity to transform theoretical knowledge into professional skills.

Teaching methods arose at a certain stage in the development of mankind and evolved along with it. The phenomena and processes of economic practice had a special influence on their appearance and use.

Until the XVIII century. skills and abilities were acquired from the master of this or that craft. Professional secrets were not explained in written or spoken language, but were only demonstrated, covering an extremely small number of people. The explanation for this was the "secret" of the craft and the long period of mastering the actions of the master.

With the advent of the Encyclopedia (1751-1772) by Denis Diderot and Jean d'Alembert, it was possible to acquire specialized knowledge of crafts without hiring a master as an apprentice. Thanks to the Encyclopedia, practical experience has been transformed into knowledge, practical training - into textbooks, concrete actions - into applied science.

By the beginning of the 18th century, the empirical level stood out in the economic and technical branches of knowledge, because the generalization of facts, observation results was realized in the systematization of concepts and the formulation of empirical laws. The 18th century marks a new stage, the victory of theory, the transition to the disclosure of substantial connections and dependencies [13].

Result and discussion

The victory of the theory, which N.P. Khvesenya speaks about, marks the prerequisites for the emergence of a gap between the purely theoretical assimilation of disciplines and the presence of competence among students of its practical application.

A vivid example of the social consequences of the “victory of theory” is the case of unsuccessful matchmaking, described in the story “Matchmaking” by Azerbaijani writer Garib Mehdiyev [4, p. 245-254]. According to the plot of the story, the protagonist - a provincial youth studying at the university, comes to the city with his mother to woo the daughter of a university professor. With the professor's daughter, he is associated with mutual feelings of love and affection. However, the girl's father, a professor, considers the applicant's theoretical knowledge of writers, poets, artists, scientists, etc., to be the main criteria for selecting a groom for his daughter. He does not think at all about how this theoretical knowledge of a general nature can help a young family to cope with the hardships of family life, bring up harmoniously developed children, and make a worthy contribution to the development of their homeland. The young man will be able to answer all the tricky questions of the professor, but the wedding will still not take place: on the day of the engagement it turns out that the young man does not know how to play the piano, but only knows the art of playing the black zurna - the national Azerbaijani instrument. Considering the young man backward and uncivilized, and, accordingly, unworthy of his daughter, the professor will kick him out.

Pondering over the sad denouement of this story, the question involuntarily arises: "And for what did the selfless fighters for the welfare of their native people from Mirza Ibragimov's novel Pervane [2], a historical and revolutionary epic depicting the life of Transcaucasia in the second half of the 19th century?"

The novel speaks of the fruitful influence of progressive Russian literature and science on the development of enlightenment and culture of the peoples of Transcaucasia - Azerbaijani, Georgian, Armenian. The educational activity of the Gori Teachers' Seminary is shown - the first school for the national intelligentsia in those years. The title of the novel “Pervane” does not lend itself to literal translation, but metaphorically means the dedication of the fighters for the welfare of their native people. Realizing that religious fanaticism and obscurantism are the main factors behind the backwardness of the peoples of Transcaucasia, patriots devoted to their country spare no effort to enlighten their people so that their native land becomes a full and integral part of the world community. Could they have assumed then that their efforts through the centuries would give rise to a cohort of "enlightened" and "cultured" citizens, ashamed of the symbols of their national culture.

Recognition of the need to stimulate the development of innovation at the intersection of science, education and business led to the creation in the 1990s. in a number of European states of National Systems of Innovation (National Systems of Innovation). The concept of National Systems of Innovation is also intended to draw the attention of politicians and government officials to the fact that the lack of interaction between the key institutions of the modern economy - science, education and business - can lead to a separate development of fundamental research, applied research and production of one or another product or service. And this leads to serious imbalances and, as a result, to general stagnation [14].

A clear confirmation of this is an excerpt from Gogol's immortal poem "Dead Souls", when the author describes the economy of Konstantin Fedorovich Kostanjoglo:

“It was evident that the owner came to the house only to rest, and not just to live in it; that to think over his plans and thoughts, he did not need an office with spring armchairs and all sorts of serene comforts, and that his life consisted not in charming dreams by the burning fireplace, but in action. The thought proceeded suddenly from the circumstances, at the minute they were presented, and suddenly turned into the case, having no need to be written down ... [1, p. 292].

... A landowner, who has arable land and lacks peasants to cultivate, but he started a candle factory, ordered candle masters from London, became a huckster! There's another fool even better: he started a silk fabric factory!

“Why, you also have factories,” noted Platonov.

- And who turned them on? Themselves started up: there was accumulated wool, there was nowhere to sell, and I began to weave cloth, and the cloths are thick, simple; at a cheap price, they are immediately taken apart in the markets. Fish husks, for example, have been dumped on my shore for six years in a row; well, where to put it? I started making glue with it, but I took forty thousand. After all, everything is so with me ...

…. Just take a closer look at your economy, you will see - all rubbish will give income, so afterwards you push away only and say: it is not necessary [1, p. 301-302].

In this episode, the author, through the mouth of Kostanzhoglo, skillfully formulates the principle of effective management and prosperity of the country. Centuries have passed, and Gogol's observations have not lost their relevance to this day.

Fourthly, the gap between the relevance of the content of educational, methodological and information support of the studied disciplines and the objectively existing realities of the life of society of a political and socio-economic nature.

The main condition for ensuring the training of highly qualified and competitive personnel is the availability of an educational, methodological and information base, which includes educational literature.

The authors of textbooks on economics and a number of other basic disciplines operate in such a complex scientific language that it is completely unacceptable for the perception of an ordinary person with average intelligence. This factor significantly narrows the circle of potential users of this literature, which reduces the efficiency of its assimilation. It should be noted here that the fundamental difference between foreign literature lies in the exceptional simplicity of the presentation of the material and the abundance of visual illustrations for the text. In addition, the combination of the studied disciplines often does not take into account the real abilities of students to perceive educational information. That is, the process of mastering the educational material must take into account the strict sequence in the construction of the scheme of passing subjects from simple to complex [10, p. 251].

Universal informatization entails not only advantages. The fundamental difference between today's youth from previous generations is that they have ceased to be reading. The streams of information are so large that it is impossible to read it in the usual mode, so students simply look through it, highlighting the most significant moments in the text. Regular reading, especially reading fiction, allows you to bring the process of transforming textual structures into clear mental images to automatism. And this is the main condition for memorizing the text and the possibility of its practical application. Another aspect is the emotional level of information perception. Reading fiction, the student penetrates into the abstract world created by the author, plunging into it with emotions and transforming it into a real one. Domestic textbooks on economics and management are completely devoid of emotional saturation. On the other hand, all the terms and definitions in the textbooks are formulated as the result of many years of searching and a deep, comprehensive analysis of the author. And in order for the learners to be able to perceive this result, the author should guide the reader along the path he has traveled. This idea is well reflected in the principle of constructing basic economic textbooks of foreign countries, where the essence of the material is presented in extremely simple language, and scientific provisions are closely and organically intertwined with life stories, historical facts and stories.

CONCLUSION

In our opinion, the following scheme should be introduced into the process of creating textbooks:

"Practical problem → Theoretical solution → Practical implementation".

In other words, we need to apply not ready-made recipes for achieving high rates of socio-economic development in other countries, but the principle of learning, which predetermined the trajectory of their positive development.

The problems of today in the social, economic, household, spiritual and other spheres should be identified and formulated as educational goals, for the solution of which it is necessary to simultaneously create a theoretical base and find analogues in the existing world experience.

This scheme will significantly reduce training costs due to the fact that students will not need to memorize huge texts of textbooks, on the contrary, in order to find a solution to a specific problem, they will have to independently revise many literary sources, as a result of which

students will develop creative and analytical abilities , and at the same time there will be a real incentive for learning, due to the presence of a specifically set goal of learning [10, p. 252].

The upbringing and educational goal of both teachers and parents is not to create comfortable learning conditions for the student, but to model situations that could potentially occur in his future life in order to increase his level of adaptability and socialization.

Modeling and collaborative learning are relevant when changing educational paradigms, when the goal is not to transmit knowledge, but to create an educational environment for discoveries and the formation of experience by the students themselves. However, these methods do not deny direct teaching and research, but, on the contrary, their balanced use in relation to certain disciplines, courses allows you to optimize the educational process [12].

Education is closely related to the economic life of society. Real knowledge is knowledge of economic laws. The applied aspect allows one to build up the theory, expand the conceptual apparatus, and reveal new principles and laws. However, excessive enthusiasm for specifics can lead to superficial, simplistic knowledge and conclusions. The "golden mean" is important here, a combination of theory and practice of economic development. [13].

Summing up, it should be noted that the solution of the above pressing problems of the pedagogical direction will be able to transform the activities of regional universities in such a way as to link together all the links of the pedagogical sphere, to form a purposeful cohort of students that can become a driving force of both production and research activities, as the main conditions of integration of education, science and production at the present stage.

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