

ческого управления профессиональной подготовкой в высшей школе, обогащающей теорию управления качеством подготовки современных специалистов. Определены перспективные направления преобразований в системе управления профессиональной подготовкой в высшей школе.

Практическая значимость. Использование полученных результатов в образовательной и производственной практике позволит повысить результативность инновационного развития системы управления профессиональной подготовкой высококвалифицированных специалистов. Материалы исследования могут быть использова-

ны в практической деятельности для проектирования современных систем управления стратегического характера, разработки содержания подготовки и повышения квалификации профессорско-преподавательского и административно-управленческого аппарата в ВУЗе.

Ключевые слова: *высшее образование, стратегическое управление, профессиональная подготовка будущих специалистов*

Рекомендовано до публікації докт. пед. наук М. І. Ситниковою. Дата надходження рукопису 03.06.15.

UDC 378.1:37.031.4:622

**V. V. Yegorov, Dr. Sc. (Ed.), Prof.,
V. S. Portnov, Dr. Sc. (Tech.), Prof.,
Ye. G. Ogoltsova, Cand. Sc. (Ed.)**

Karaganda State Technical University, Karaganda, Kazakhstan, e-mail: kargtu@kstu.kz

FORMING MINING STUDENTS' PROFESSIONAL COMPETENCES WHILE STUDYING HUMANITIES

**В. В. Єгоров, д-р пед. наук, проф.,
В. С. Портнов, д-р техн. наук, проф.,
Е. Г. Огольцова, канд. пед. наук**

Карагандинський державний технічний університет, м. Караганда, Республіка Казахстан, e-mail: kargtu@kstu.kz

ФОРМУВАННЯ ПРОФЕСІЙНИХ КОМПЕТЕНЦІЙ У СТУДЕНТІВ-ГІРНИКІВ ПРИ ВИВЧЕННІ ГУМАНІТАРНИХ ДИСЦИПЛІН

On the base of Karaganda State Technical University (Kazakhstan) programs for computer support have been developed and introduced into the educational process promoting formation of professional competences of mining students while studying humanities.

Purpose. To achieve quality changes in the process of forming professional competences of mining experts. To reorient the content of the variable part of humanities for mining specialties taking into account professional needs of students.

Methods. They are based on developing and introducing the programs for computer support of teaching humanities (history, philosophy, sociology, political science, cultural science) in the educational process to form professional competences at mining students.

Results. The results of the carried out experiment are presented which permit drawing a conclusion of quality changes in the course of forming professional competences of experts for the mining complex while using profession-focused programs of computer support in the educational process.

Scientific novelty. The process of forming future miners' professional competences alongside with specific course units is for the first time carried out when studying humanities.

Practical importance. As a result of the obtained data when studying humanities, positive dynamics is observed in the course of forming professional competences of mining students which is expressed in the positive relation to the profession and representatives of the professional community; understanding the public mission of the technical profession; understanding the social responsibility for adoption of technical and technological decisions; forming the attitude towards themselves as to professionals.

Keywords: *forming professional competences, quality changes, specialists for mining, computer support programs*

Introduction. The mining complex is one of the main sectors of economy having a significant effect on

the formation of macroeconomic indicators of all states and the national economy following the oil and gas sector. Nevertheless, the most important problem of this branch is traditionally the personnel hunger. "In

the mining industry a severe shortage of professional personnel is observed. The knowledge community is generally presented by people of retirement and pre-retirement age”, – the Minister of industry and new technologies of Kazakhstan A. O. Issekeshv declared at one of the meetings of the Government [1]. According to the head of the Ministry of industry and new technologies, in Kazakhstan the incentives for the inflow of new trained staffs have not been developed. In the course of the round table discussion a number of practical measures taken in this direction were presented. In particular, one of the main sections of the industry program provides staff assistance in the mining branch with the purpose of training young staffs, and increasing the prestige of mining professions. This problem is topical for all the states of the former Soviet Union.

The present stage of the mining development, which is associated with complex social, economic and political processes, has put forward an urgent problem of forming the identity of a young specialist who is a direct producer of material benefits, an essential resource of increasing the economic and cultural capacity of the country. A high level of well-formedness of a young specialist's identity becomes one of the conditions of the sustainable development of production and public relations.

Quickly changing technologies, their knowledge intensity strengthening require a worker's flexible professional adaptation, and a new level of culture. Under the conditions of the market economy, the miner's profession acts as one of the means of a person's social security, self-affirmation, and self-realization. The competitiveness of a present day expert is defined not only by the width and quality of their professional knowledge, but also by a high level of culture, education, and competence.

Traditionally, the problem of forming professional competences at a technical university was solved while studying specialist disciplines whose content promotes students' development as future experts [2]. However, this task is to be faced not only by teachers of specialty courses, but also by compulsory discipline departments, in particular, the teachers of humanities. As an alternative to the current situation, it can be proposed to reorient partially studying humanities at technical colleges to the problem of forming professional competences of future experts. Developing the content of humanities provides the accentuation of the variable part which harmoniously combines the requirements of the state standards of education and features of vocational training. It would permit partially solving the problem of quality changes in the process of forming professional competences of future experts.

The quality changes in the process of forming professional competences of students trained in “Mining” when studying humanities are understood as the formed positive attitude to work, to people in the course of work, to themselves as to a subject of professional activity. The criterion of efficiency and optimality in selecting pedagogical factors is the ultimate out-

come as the process of forming professional competences of students.

One of the conditions of solving the problem of quality changes in the process of forming professional competences of future experts for the mining industry (developing their positive attitude to work, to people in the course of work, to themselves as to the subject of the production environment) is developing the interest in professional activity when studying humanities [3].

Thus, the need for quality changes in the process of forming professional competences of students trained in “Mining” when studying humanities, as well as in theoretical, experimental grounding of developing computer technologies, their effective use in the educational process of a higher education institution defined the relevance of the present study connected with the development of electronic educational and methodical support of this process.

Analysis of the recent research. At different times, the problem of quality changes in the process of forming professional competences of mining specialists has been considered by: Bychkova I. I., Veter A. N., Grebeniuk G., Gumeniuk O. M., Zhulkevskaiia V. A., Kravchuk G., Prussak V. F., Prokofiev Ye. G., Podtergera Ye. N., Stelmashenko V. P. A great contribution to studying organizational and pedagogical bases of managing the process of vocational training at a mining HEI has been made by Havriliuk O. A., Yevenko O. [4], Melnichenko V. V., Sergeiev L. N., and Fursa O. A.

The analysis of the works of the above-mentioned scientists has shown that they see the solution of the problem of quality changes in the process of forming professional competences of mining experts, first of all, when studying specialty courses whose main objective is to supply students with professionally significant knowledge and skills [5].

Forming students' professionally significant qualities, a positive attitude to the profession and representatives of the professional community, understanding the public mission of the profession, understanding the social responsibility for making technical and technological decisions, the attitude towards themselves as to professionals still remains an unresolved task in the field.

The objective of the present study was developing and introducing the academic programs for technical support of teaching humanities (history, philosophy, sociology, political science, cultural science) into the educational process of future mining experts with the purpose of quality changes in the process of forming professional competences. These programs for technical support include: “History of formation and development of the mining and processing complex of the Republic of Kazakhstan”, “History of formation and development of mining and metallurgy in Russia and Kazakhstan”, “Sociology and psychology of technical work”, “Engineering philosophy”.

This study was conducted on the base of Karaganda State Technical University (Mining faculty) (Kazakhstan) and National University “Lviv Polytechnic” (Faculty of geodesy) (Ukraine).

Presentation of the main research. To achieve the objectives, i. e. achieving quality changes in the process of forming professional competences of mining students while studying humanities, programs for computer support have been developed. These programs offer the material connected with professional features of students alongside with the obligatory training material.

Students can assess their knowledge of a subject taking a test. All the tests are made on the principle of the students' professional interest: to prepare for them students will have to study deeper the history of origin and formation of their future profession, to get aware of prospects of its development. In order to cope successfully with the offered tasks, students use the supplementary profession-focused literature. Thus, a student can independently check their current knowledge, without direct participation of the teacher. The results of testing are processed statistically, the most difficult subjects to learn are identified: a student will be able to start studying the following subject, only having acquired 60 % and more of correct answers to the test questions of the previous subject, otherwise the program suggests a student to return to the studied subject again (access to the following subject is blocked).

Students are also offered a list of supplementary literature for preparing summaries, term papers and scientific projects which are carried out within independent work in specialty disciplines.

To a large extent, these programs have showed that the students' activity in the process of forming professionally significant competences is achieved by means of developing a situation of professional enthusiasm, thoughts, search which affected fruitfully the process of students' vocational training.

The process of forming students' professional competences while studying humanities is based on defining and changing the following criteria: a positive attitude to the profession, understanding the public mission of the profession, understanding the responsibility for decision-making, the attitude towards themselves as to subjects of professional activity. To define quality changes in the process, three professional levels of training mining students have been distinguished:

- a low (insufficient) level (a superficial idea of purposes and problems of the professional activity, lack of interest in the future profession, unwillingness to adapt the knowledge and abilities taking into account professional requirements, lack of understanding the public sense of the selected profession);

- an adequate level (a interest focus on the future professional activity, an obvious need for educational achievements and professional self-expression, partial association of themselves as future experts);

- an optimum level (expressed interest and a positive attitude to the profession, understanding its public mission, definiteness of professional plans and intentions, real assessment of positive and negative sides of the future profession, understanding the social responsibility for making independent decisions) [6].

Thus, we can analyse changing the index of levels of forming professional competences of experimental

groups throughout the experiment (all 308 students who were trained in "Mining" were involved in the experiment) (Table 1).

Interpreting the obtained data, we note that upon termination of the experiment there are observed quality changes in the process of forming professional competences of mining students when studying humanities in the experimental groups. Such a conclusion can be drawn in connection with an increasing number of students with the optimum level of professional competence formation from 17.8% at the beginning of the experiment to 47.4% after its completion, as well as with reducing percentage share of students with the low level of professional competence formation from 36.6% to 11.6%. In the control groups the changes were minimal (2–3%).

As a result of the obtained data we came to the conclusion that using the profession-focused programs for computer support in the educational process provides quality changes in the process of forming professional competences of experts for the mining and processing complex. Besides, it was revealed that use of these programs affected the results of the students' progress positively. As an example, we will analyse the students' progress in the course unit of "History" within the experimental period.

This work was done on the base of Karaganda State Technical University (the number of students was 208, which corresponded to the exact number of students participating in the experiment from this higher education institution); students of "Mining" specialty were included into the experimental group, students of "Technology of Machines and Equipment" and "Geodesy and Cartography" specialties were included into the control group (Table 2).

Table 1

Assessment of the levels of forming mining students' professional competences while studying humanities throughout the experiment (experimental groups)

Level	Beginning of the experiment		End of the experiment		Result	
	people	%	people	%	people	%
optimum	55	17.8	146	47.4	+91	+29.6
adequate	141	45.6	126	41	-15	-4.6
low	112	36.6	36	11.6	-76	-25

Table 2

Students' progress assessment in the course unit of "History" throughout the stating, forming and controlling experiments

Groups	2007–2008 ac. year	2008–2009 ac. year	2009–2010 ac. year	Total
	GPA	GPA	GPA	GPA
Control	3.35	3.38	3.42	+0.07
Experimental	3.38	3.54	3.87	+0.49

Analysing this Table, we can see that all the students have approximately an identical initial level of knowledge (3.35–3.38 points); the GPA progress in history increased in the experimental groups from 3.38 to 3.87 whereas in the control groups it was from 3.35 to 3.42. For the experimental groups, it is also possible to establish the fact of greater scientific enthusiasm for the profession which was expressed by increasing hours of students' work at the library and, as a result, in more active publication of professionally significant scientific articles (their quantity increased by 22 % within the experiment).

Conclusions. Thus, summing up the conducted experiment allows claiming that the program of quality changes in the process of forming professional competences of students as future experts of the mining branch allows:

- 1) capturing maximum of educational objects;
- 2) realizing the strategy of forming professional competences;
- 3) describing the complex of pedagogical conditions, various connections with classroom work, their interference.

This promotes the removal of contradictions between the objective need for changing approaches to the process of forming professional competences of a mining university and the insufficient development of the problem of using humanities in this process.

Within the declared problem, we consider studying humanities at a mining university not as an addition to the basic vocational education but as the most important element of training experts for the mining and processing complex. It is possible to observe positive dynamics in forming professional competences of mining students when studying humanities, which is expressed in: a positive attitude to the profession and representatives of the professional community, understanding the public mission of the technical profession, understanding the social responsibility for making technical and technological decisions, the attitude towards themselves as to professionals. This methodology of teaching humanities can be used for the process of forming professional competences of students of other technical specialties.

We consider that the described method of developing the process of forming professional competences of mining university students while studying humanities is prospective in the context of modernizing vocational education and modernizing the present day economy on the whole.

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На базі Карагандинського державного технічного університету (Республіка Казахстан) розроблені та впроваджені в навчальний процес програми для комп'ютерної підтримки, що сприяють формуванню професійних компетенцій у студентів-гірників при вивченні гуманітарних дисциплін.

Мета. Добитися якісних змін у процесі формування професійних компетенцій у фахівців для гірничої галузі. Переорієнтувати зміст варіативної частини гуманітарних дисциплін гірничих спеціальностей з урахуванням професійних потреб студентів.

Методика. Базується на розробці й впровадженні в навчальний процес програм для комп'ю-

терної підтримки викладання гуманітарних дисциплін (історії, філософії, соціології, політології, культурології) для формування професійних компетенцій у студентів-гірників.

Результати. Наведені результати проведеного експерименту, що дозволяють зробити висновок щодо якісних змін у процесі формування професійних компетенцій у фахівців для гірничопромислового комплексу при використанні в навчальному процесі професійно-орієнтованих програм для комп'ютерної підтримки.

Наукова новизна. Процес формування професійних компетенцій у майбутніх гірників, наряду зі спеціальними, уперше здійснюється при вивченні гуманітарних дисциплін.

Практична значимість. У результаті отриманих даних при вивченні гуманітарних дисциплін є позитивна динаміка у процесі формування професійних компетенцій у студентів-гірників, що виражається у позитивному відношенні до своєї професії та представникам професійної спільноти, розумінні громадської місії своєї технічної професії, усвідомленні соціальної відповідальності за ухвалення технічних і технологічних рішень, формуванні відношення до себе як до професіонала.

Ключові слова: *формування професійних компетенцій, спеціалісти для гірничої справи, програми для комп'ютерної підтримки*

На базі Карагандинського державного технічного університета (Республіка Казахстан) розроблені та впроваджені в навчальний процес програми для комп'ютерної підтримки, що сприяють формуванню професійних компетенцій у студентів-гірників при вивченні гуманітарних дисциплін.

Цель. Добитися якісних змін у процесі формування професійних компетенцій у спеціалістів для гірничого дела. Переорієнтувати зміст варіативної частини гуманітарних дисциплін по гірничим спеціаль-

ностям с учетом профессиональных потребностей студентов.

Методика. Базируется на разработке и внедрении в учебный процесс программ для компьютерной поддержки преподавания гуманитарных дисциплин (истории, философии, социологии, политологии, культурологии) для формирования профессиональных компетенций у студентов-горняков.

Результаты. Представлены результаты проведенного эксперимента, которые позволяют сделать вывод о качественных изменениях в процессе формирования профессиональных компетенций у специалистов для горнопромышленного комплекса при использовании в учебном процессе профессионально-ориентированных программ компьютерной поддержки.

Научная новизна. Процесс формирования профессиональных компетенций у будущих горняков, наряду со специальными, впервые осуществляется при изучении гуманитарных дисциплин.

Практическая значимость. В результате полученных данных при изучении гуманитарных дисциплин наблюдается позитивная динамика в процессе формирования профессиональных компетенций у студентов-горняков, которая выражается в положительном отношении к своей профессии и представителям профессиональной общности, понимании общественной миссии своей технической профессии, осознании социальной ответственности за принятие технических и технологических решений, формировании отношения к себе как к профессионалу.

Ключевые слова: *формирование профессиональных компетенций, специалисты для горного дела, программы для компьютерной поддержки*

Рекомендовано до публікації докт. техн. наук Т. К. Ісабек. Дата надходження рукопису 22.02.15.