Motivation as a Factor of Professional Competence Development in Students

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Abstract — Nowadays the issue of developing competencies of students is extremely relevant. The article is devoted to the development of professional competencies in bachelors of a technical university, studying the discipline "Hydraulics and oil and gas hydromechanics" and "Oil and gas business". The article analyzes the influence of students' motivation on the quality of knowledge and development of competencies. It also substantiates the need to increase the level of students' motivation for learning activities. The author gives recommendations how to improve the level of motivation. One of the effective ways is to use a point-rating system. The article describes the point-rating system that is used in the educational process of the Oktyabrsky branch of Ufa State Petroleum Technical University, which helps to improve the level of motivation of students to learning activities. The article describes the development of the motivational criterion taking into account three levels: low, medium and high. The content of all three given levels of development of the motivational criterion is described. The article analyzes the results of the survey according to the methods developed by T.D. Dubovitskaya and T.I. Ilyina to identify the level of motivation in full-time and part-time students. An experimental study aimed at increasing the level of motivation in full-time students conducted in the control group of students is described. The results obtained in the control and experimental groups are compared, and conclusions are drawn.

Keywords — professional competencies, motivation criterion, motivation

I. INTRODUCTION

In modern society, there is a global trend - the fundamentalization of education. Education is becoming the foundation of any human activity. The crucial issue is quality of education. A system of lifelong education is an element of the lifestyle. A new paradigm was created. A person is considered educated if he is prepared for life, guided by complex problems of modern science and culture, able to comprehend his place in the world. The competency-based approach meets realities of modern society and is used to train specialists with competencies capable of continuous professional self-improvement [3, 6, 7, 9, 10].

II. PROBLEM STATEMENT

A number of researchers of the competency-based approach describe the composition of competencies. According to I.A. Winter, the competencies include

motivational, cognitive, behavioral, value-semantic and emotional-volitional components. Exploring the readiness of students for professional activities, M.I. Dyachenko and L.A. Kandybovich distinguished five components, among which motivational, expressing interest and a positive attitude towards the chosen profession.

The motivation for learning activities as a positive factor has been described by many researchers. One of the factors affecting the effectiveness of the educational institution is the degree of formation of the internal need for acquisition of knowledge and its transformation into an independent goal. The correct organization and the presence of motivation for independent expansion and deepening of knowledge contribute to students' independent work [1, 2].

Activities of the graduate are always polymotivated. Two types of motives characterize learning activities - achievement motives and cognitive motives. In learning, achievement motivation is subject to professional and cognitive motivation.

High intelligence is less important than a high level of motivation. Researchers highlight the principle of motivational support for the educational process. There are two groups of motives: internal and external. According to L.M. Fridman, external motives cause an incentive to activities, but are not connected with them; the motives directly related to the activities are internal.

Four groups of motives for self-educational activities are distinguished by E.A. Semenova and N.S. Pryazhnikov. The first group includes the search for a place in life, the need for self-determination, the desire to put into practice knowledge gained and build a professional career. Motives, where power of one's own cognitive interest acts as a driving force for activities, are referred to the second group. The third group of motives includes the needs in self-improvement, personal growth and development of abilities. The fourth group of driving motives is hobbies.

A. Maslow identified five levels of motivation: physiological, security needs, communication and attachment needs, the need for respect and self-esteem, and the need to implement one's needs and talents.

Motivation has a stimulating effect on effective self-educational activities of students throughout the learning

process. Motivation is the driving force of creativity and development [11–13].

The needs of the individual in self-education are the basis of motivation [14, 15]. They form motives for self-education.

In the context of educational activities, students master disciplines to achieve other goals: a diploma, good marks, a scholarship, fear of being expelled.

Internal motives and the desire to master disciplines coincide while acting in the form of goals and motives. Internal motives characterize the cognitive need, pleasure that students experience in the process of cognition. The dominance of internal motives allows activity of students to be manifested [5].

It can be concluded that a high level of learning motivation contributes to the development of competencies and affects the overall level of training of future specialists.

III. RESEARCH QUESTIONS

One of the main tasks of university teachers is development of students' motivation for professional activities.

Since the motivation of students plays an important role in the development of competencies, the motivational criterion as one of the development criteria can be used. Its basis is the student's system of motivational relations. The motivational criterion characterizes needs of students in research activities, cognitive activities, the need for manifestation in the process of cognition of independence, decision making [4].

An indicator of development of the motivational criterion is the level of students' interest in profession. There are three levels of development: low, medium and high.

The low level of development is characterized by a low cognitive interest, expressed only in attention to certain knowledge and facts. The medium level implies the interest in dependencies and patterns, identification of their cause-effect relationships and possible independent identification. The high level is distinguished by students' interest in deep theoretical problems and creative activities. If students have a high level of cognitive interest, they have a cognitive need.

IV. PURPOSE OF THE STUDY

The study was conducted in the branch of Ufa State Petroleum Technical University in Oktyabrsky. The purpose is to develop professional competencies in students studying "Oil and Gas Business" ("Maintenance of Oil Production Facilities").

A questionnaire was conducted to identify the focus and level of development of internal motivation, which allowed identifying conditions and factors that influence the degree of motivation.

The questionnaire was conducted in eleven groups of second-year full-time (173) and part-time (48) students. The questionnaire was aimed at identifying interest in the disciplines: Hydraulics, Hydraulics and Oil and Gas

Hydromechanics, Fluid and Gas Mechanics, and Heat Engineering.

V. RESEARCH METHODS

For the survey, the methodology by T.D. Dubovitskaya was used.

The survey showed that part-time students (60.1%) have internal motives for learning activities, and only 39.6% are guided by external motives. 4.2% of respondents have a low level of motivation, a high level was shown by 18.7% of students. 77.1% showed an average level of internal motivation.

Analyzing the results of the questionnaire for full-time students, we can conclude that the prevalence of internal motivation was observed in 54.6%; 45.4% of students have external motivation. A low level of internal motivation is observed in 10% of students, 73.2% of students have an average level of motivation, and only 16.8% have a high level of motivation.

Part-time students showed a higher percentage of internal motivation is due to the fact that full-time students are those who entered a higher educational institution immediately after graduation from school. They lack information about their future profession and professional activities.

Part-time students are working people, employed in the field they study. They understand the need to study these disciplines, which affects the increased level of internal motivation. To increase the motivation level, it is necessary to conduct career guidance work, acquaint students with their future profession, which will affect results of educational activities and professional training.

The study was conducted in twelve full-time (126 people) and part-time (61 people) groups to identify the level of motivation by the method developed by T.I. Ilyina. The methodology was compiled using methods of other authors. It includes three sections: "Acquisition of knowledge", "Mastery of a profession", "Getting a diploma". In the section "Acquisition of knowledge", curiosity of students, the desire to acquire new knowledge are diagnosed. The section "Mastering the profession" describes the desire to acquire professional knowledge and develop professionally important qualities. The section "Getting a diploma" reflects the desire of students to get a diploma, gain formal knowledge, and pass exams.

The questionnaire survey showed that "Acquisition of knowledge" was the main motive for learning, since 55.8% of part-time students have a high level in this indicator. Students underestimate the importance of the indicator "Mastery of the profession", 70.5% of students have an average indicator. 13.1% of full-time students and 6.6% of part-time students have a low level in the categories "Acquisition of knowledge" and "Mastering a profession". It is alarming that 65.6% of the students want to get a diploma instead of professional knowledge.

The results of the questionnaire allow concluding that full-time students have a lower level of motivation in the sections

“Acquiring knowledge” and “Mastering a profession” than part-time students.

VI. FINDINGS

The level of motivation for the educational activities can be improved using the point-rating system. In Oktyabrsky branch, it is used for the full-time students. Under this system, students' knowledge is assessed on a wider scale; points vary from zero to 100. With the correct organization of a rating technology, the five-point rating system is used when the number of points received by students is translated into the traditional marks “excellent”, “good”, “satisfactory”. A significant expansion of the range of grades allows a more objective assessment of individual abilities of students.

Within the point-rating system, extensive databases of differentiated individual tasks are created and widely used; students can choose tasks, while receiving a different number of points.

Differentiation of tasks can take various forms, several options differing in the level of complexity. The degree of independence of individual work is different. There are four difficulty levels. The first level includes tasks based on samples. This level is preparatory to subsequent independent activities. The second level consists of reproductive tasks: students reproduce signs of concepts, perform tasks according to a given pattern. The third level consists of productive tasks that require the use of previously acquired knowledge to solve problems; the solution goes beyond the boundaries of well-known models. The last level consists of tasks whose solution requires the transfer of knowledge in completely new situations for students.

The least prepared students receive a system of tasks containing samples of solutions and tasks to be solved on the basis of the studied sample. The most prepared students draw up a work plan, select materials, the work may be of a research nature.

The differential approach enables each student to develop skills and abilities, gain experience of cognitive activity, and formulate the needs for self-education. This is the positive effect of independent work.

The effectiveness of a differentiated approach requires the teacher to study the level of development of attention, thinking, memory, diagnose the level of knowledge and skills, which makes it possible to carry out further individualization.

Conditions are created for the development of potential abilities of students; each student has the right and ability to independently determine the level of complexity of the tasks.

Students independently arrange prolonged differentiated tasks from adaptive to developing and constructive ones.

The use of adaptive tasks allows students to prepare for modern professional, socioeconomic and cultural realities. Tasks aimed at developing orientation contribute to the broad development of human abilities, a creative potential. When using tasks of creative orientation, students develop their abilities and build their own career path.

This approach gives students the opportunity to get an idea of their own educational level, to see the level of development in order to plan their future movement. Students choose the pace of independent individual activities. The purposeful selection of differentiated prolonged tasks allows the development and implementation of their own educational activities, while the teacher provides psychological and pedagogical support for his professional self-determination. Organizing independent activities for the selection of prolonged tasks, students have to make decisions, alternating theoretical analysis and forecasting. At the same time, conditions are created for self-expression of the individual and achievement of the set learning goals.

The rating system includes the accrual of additional incentive points: for original performance, active participation in classes, a significant advance in the schedule for completing tasks, etc. Students have the opportunity to get extra points and increase their rating by participating in competitions and conferences, performing individual creative tasks.

The point-rating system allows regular monitoring of quality of students' knowledge and skills, it becomes possible to stimulate better performance and reduce the time for completing tasks, the desire for creativity is stimulated, which affects students' motivation for learning activities.

The task of increasing the level of motivation can be solved when students perform tasks that allow them to see the results of their activities. The use of pedagogical influences with the presence of incentives helps to increase the level of motivation. Personalized individualization of assignments is widely encouraged. For less prepared students, sparing conditions are created, they have additional time to solve tasks. At the same time, to stimulate the rhythm of work and quality training, a system of penalty points is widely used: for not fulfilling the schedule, poor quality of task performance, etc.

Knowledge is assessed according to the number of points received by students during the semester. The maximum number of points is 100. In the discipline “Hydraulics and oil and gas hydromechanics”, points are awarded for the following types of work: testing, performing and protecting laboratory works, performing test works, working in practical classes, performing CGW (Computational and graphic work), exam.

The process of organizing students' activities aimed at self-development and self-improvement is facilitated by reflection. Reflection (Latin *Reflexio* means turning back) is an ability of human thinking to critical introspection. The concept “reflection” was first introduced in the seventeenth century by the English philosopher John Locke, who defined reflection as a process that contributes to the accumulation and receipt of new ideas. Reflection can be represented in the form of thought of an active or emotionally experienced process of awareness of own activity. Main components of activity, such as meaning, problems, methods and solutions, their results, are identified. At the same time, students, formulating the results of their own activities, redefine goals which allows them to obtain higher results.

An experimental study was also conducted. 44 people participated in it. On the basis of the experimental site of the department of Mechanics and Technology of Mechanical Engineering, two groups of students were created: control and experimental ones.

An indicator of development of the motivational criterion for the development of professional competencies is the presence of motivation, the manifestation of interest in educational activities. The methods developed by T.D. Dubovitskaya were used as diagnostics tools. They aimed at determining the level of development of the internal motivation for learning activities.

At the initial stage of the experiment, in the control and experimental groups, a survey was conducted according to the methods by T.D. Dubovitskaya and T.I. Ilyina. In the control group, the low level of motivation was observed in 19% of students, the average one - in 57%, the high level - in 24%. In the experimental group of students, the low level of motivation was observed in 22% of respondents, the average level - in 65.2%, the high level - in 12.8%.

By analyzing the data obtained, we can conclude that the level of educational motivation at the initial stage did not differ significantly.

At the next stage of development of professional competencies, teacher's activities were organized on the basis of previously selected pedagogical technologies: prolonged tasks and specific production problems; problematic issues; research work, conference reports; independent work in small groups during laboratory classes.

The analysis of development of the level of motivation showed that in the experimental group the number of students with a low level of motivation decreased and the number with a high level. In the control group, positive indicators were lower.

VII. CONCLUSION

During laboratory and practical exercises in small groups, students developed communication skills. Creative skills developed when choosing ways to do work. Independent knowledge acquisition skills developed as well.

Created conditions for the development of professional competencies increased the level of motivation of students of a technical university to learning activities, which was a potential for the development of specialists capable of working in the ever-developing professional environment.

References

- [1] J. Brehm, B. Eisenhauer "Motivations for participating in community supported agriculture and their relationship with community attachment and social capital. Southern rural sociology" Journal of Rural Social Sciences, vol. 23 iss. 1, pp. 94-115, 2008
- [2] E.L. Deci "Intrinsic Motivation and Self-Determination in Human Behavior" Berlin: Springer Science & Business Media, 1985.
- [3] R.A. Fahrutdinova, "The Model of Forming Communicative Competence of Students in the Process of Teaching the English Language" International Journal of Environmental & Science Education..vol. 11 (6), pp. 1285-1295, 2016
- [4] E.L. Guseinova, "Organizational and pedagogical conditions for the development of professional competencies in the technical students' individual work through the example of studying the discipline «Hydraulics and fluid mechanics»" European Journal of Contemporary Education. Vol. 7, No 1, Pp. 118-126. 2018
- [5] E.L. Guseinova, "The role of students' internal motivation for educational activities in shaping the future of a high-class specialist" Oil and Gas Business. Scientific and technical journal.. vol. 10. No. 2. pp. 153-155, 2012
- [6] A.Z. Ibatova, N.V. Ippolitova, S.K. Mukhametgaliyeva, A.E. Rodionova, K.N. Yagafarova, L.N. Ikonnikova "Lifelong professional education in the Russian federation: Personal aspect" International Journal of Environmental and Science Education vol. 11, No 16, pp. 9426-9436. 2016
- [7] E.A. Mukhtasarova, "State of modern Russian youth tolerance" European Proceedings of Social and Behavioural Sciences vol. 50, pp. 206-213, April 2018 (RPTSS 2018, p. 1464, 2018) DOI: 10.15405/epsbs.2018.12.26.
- [8] R.M. Ryan "Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being" American Psychologist. vol 55, pp. 68-78, 2000.
- [9] L.Z. Samigullina, "Some Aspects of Cognitive and Ideographic Characteristics as a Means of Professional Terminological System Description" European Research Studies Journal. vol. XVIII. Iss. 4. pp. 197-210, 2015.
- [10] R.M. Shaidullina, A.F. Amirov, V.S. Muhametshin, and K.T. Tyncherov, "Designing Economic Socialization System in the Educational Process of Technological University," European Journal of Contemporary Education, vol. 6, no. 1, pp. 149-158, 2017, DOI: 10.13187/ejced.2017.1.149
- [11] R.R. Shangareev, "Role of employee motivation in an industrial occupational risk management system" IOP Conference Series: Earth and Environmental Science. vol. 194, No2. 022033, pp. 1-7. 2018
- [12] R.R. Shangareev, "The formula for determining motivation indicators in the occupational risk management system" IOP Conference Series: Materials Science and Engineering vol. 560, No 1, pp. 1-6, December 2018 (MEACS 2018, 2018). DOI: 10.1088/1757-899X/560/1/012201.
- [13] R.R. Shangareev, "The formula for determining motivation indicators in the occupational risk management system" IOP Conference Series: Materials Science and Engineering Vol. 560, No 1. Pp. 1-7 December 2018. (MEACS 2018) DOI: 10.1088/1757-899X/560/1/012201.
- [14] S. Stagl., S. U. O'Hara "Motivating factors and barriers to sustainable consumer behaviour. International Journal of Agricultural Resources", Governance and Ecology. vol. 2, iss. 1, pp. 75-88, 2002
- [15] V.H. Vroom, Work and Motivation.- Revised Edition. Jossey-Bass Classics. 331 p. 1995