

The Concept of Continuing Education in the Context of Its Modernisation and Reform in Oil Training

Olga Lvovna Panchenko¹, Vyacheslav Theodorovich Volov², Yevgeny Arkadyevich Volokhin³,
Mirsaid Pulat ugli Mirasrarov¹ & Diana Rinatovna Khisamutdinova¹

¹ Institute of International Relations, Kazan Federal University, Russia

² Samara State Transport University, Russia

³ Oil Technical School (Izhevsk), Russia

Correspondence: Olga Lvovna Panchenko, Institute of International Relations, Kazan Federal University, Russia.

E-mail: mirasrarov@gmail.com

Received: September 1, 2020

Accepted: October 19, 2020

Online Published: October 31, 2020

doi:10.5430/ijhe.v9n8p105

URL: <https://doi.org/10.5430/ijhe.v9n8p105>

Abstract

The article presents the concept of development and modernisation of the model of multi-level continuing vocational education for the oil and gas industry of the Udmurt Republic under the conditions of its reform. The relevance of continuing education research in the context of its modernisation and reform stems from the need for highly qualified staff and the need to modernise the vocational education system. The article highlights the positive effects of the network forms of educational programs using individual learning paths implemented following the Concept for the Modernisation and Development of a Multi-Level Continuing Vocational Education Model. The oil and gas industry of the Udmurt Republic (Russian Federation) is undergoing educational reform. The results of the monitoring of the effectiveness of the implementation of the model of continuous vocational training for the oil and gas sector show a high level of demand, employment and the quality of education received by graduates of educational institutions of the Resource Centre for Training of Personnel for the Oil and Gas Industry of Udmurtia.

Keywords: continuing education, resource centre, educational programs, public-private partnership, value orientations

1. Introduction

The relevance of research into continuing education in the context of its modernisation and reform stems from the need for highly qualified personnel, the need to modernise the vocational education system and the need to develop measures, To enable the following objectives to be achieved: concentration and consolidation of the resources of the network of vocational training institutions; improvement of the quality of the educational environment and advancement of the content and technology for the implementation of vocational training programmes; Developing the human and methodological potential of the vocational education system.

Among the studies on the problems of continuing education, the monograph of A.P. Vladislavleva, where he emphasised the objective need for systematic and self-development of skills by employees, and this applied to all age groups (Горшков & Ключарев, 2011). There is currently no consensus on the concept of continuing education (Зайцева, 2009).

The main socio-economic factors influencing the continuing vocational education of gas and oil workers are:

- The dynamic development of the oil and gas industries as priority sectors of the economy;
- shortage of highly qualified and middle-level workers;
- risks of unemployment;
- competition between educational organisations and corporate training centres;
- low motivation for apprenticeship training;

- the unsatisfactory state of the educational facilities;
- insufficient methodological, information and technological support for the educational process and poor orientation towards the requirements of employers and high-tech production; is the gap between science, education and business, which «makes the problem of devaluation of academic qualifications more serious» (Wang & Jen-De, 2019).

The above-mentioned main factors have determined the need for the formation of continuing vocational training for the oil and gas industry of the Udmurt Republic in the context of its reform and modernisation.

Education must take into account the need to meet the lifelong learning needs of people, at all stages of life, wherever they may be (Wang & Jen-De, 2019).

Today, the educational arena of the twenty-first century is increasingly a mixture of schools and universities, digital media providers, businesses and an extensive national network of non-formal educational institutions and resources. Together, these resources constitute a complex ecosystem of scientific and educational resources and capabilities (Falk & Dierking, 2019; Melash et al., 2020).

The key challenge for employers is to identify, attract, develop and retain talented people. The following qualities are important for employers: learning ability, critical thinking abilities («fluid intelligence»), ability to change («adaptability»), sustainable thinking throughout life, presence of «hard skills» and experience of students (Drewery et al., 2020).

2. Methods

Throughout the study, theoretical methods were applied. These methods include research and analysis of scientific works (retrospective analysis of the formation of a partnership between sectoral vocational training institutions and employers of personnel, The operation and validation of the model of multi-level continuing vocational education for the oil and gas industry of the Udmurt Republic, under the conditions of its reform (hereinafter referred to as the model), taking into account changes in educational standards and education legislation).

As empirical methods employed: the process of questionnaire based on the B.S. Kruglov methodology «Determination of the formation of value orientations» (adapted and modified version of the M. Rokich methodology) (Волов & Волохин, 2019) and a knowledge checklist was carried out. The primary aim of this survey was to determine the quality of continuing professional training for students of the pilot groups of educational institutions of the Resource Centre for Training for the Oil and Gas Industry of Udmurtia, a new type of association (after this RC). The experience of the Singapore Institute of Technology was investigated, and then students were surveyed to determine their perception of the skills they had obtained for employment. Employers regard the following skills necessary for employment: teamwork, problem-solving skills, adaptability, flexibility and initiative, ability to cope with work difficulties, ability to learn, professionalism (Lim et al., 2020).

3. Results and Discussion

The Udmurt Republic has now developed: approved by the Minister of Education and Science of the UR in 2014, and the Concept of Development and Modernization of the model of multi-level continuing vocational education for the Oil and Gas Industry of the Udmurt Republic under the conditions of its reform (Волохин & Волохин, 2014) (hereinafter referred to as the concept).

Scientific and methodical support for the implementation of the model is carried out in the mode of operation of the central experimental site of the Academy of Vocational Education of Moscow.

The experimental base of the research is the organisations in the composition of RC: Apou Ur "Tek" «Fuel and Energy College» (hereinafter - College), Institutions of a private, professional educational organisation «Oil Technical College» (hereinafter - Technical College), Kalashnikov Izhevsk State Technical University (hereinafter - Izhevsk State Technical University), Municipal general education budget institution, general secondary school 7, the basic enterprises are employers of Udmurt Republic.

The significant lines of action for the improvement and modernisation of the model are, first of all, the process of continuous education of pupils in individual study plans using web-based forms of educational programmes. Simultaneously, preserving the legal autonomy of the educational organisations forming part of the RC and ensuring

the continuity of the educational programme documentation in the system of public-private partnerships in the context of the reform of Russian education should be taken into account.

Training in the system of continuing vocational education is carried out in several directions in educational institutions of the RC:

- 1) *College - Technical College.*
- 2) *School - Technical College - College.*
- 3) *College - Technical College - University.*

The following organisational and pedagogical conditions are being created in educational institutions of the RC:

- Is the presence of high-tech equipment, testing grounds, simulators - capital repairs, drilling, oil and gas extraction providing training simulation of technological processes. Real-time simulator exercises use the problem practice method described in the writings of Tomoya Horiguchi (Horiguchi et al., 2015).
- Development and introduction into the educational process of new professional standards (College, Technical School and Udmurtia oil organisations develop a project of professional standard in the profession «Driller of operational and exploration drilling wells for oil and gas» (Volokhin, 2015))
- Use of modern textbooks and methodological literature developed for new standards (professional standards) in the educational process. Under the authorship of the participants of the creative group of educational institutions of the RC published textbooks «Performing works on drilling of wells», «Performing works on maintenance of reservoir pressure», «Conducting the process of hydraulic fracturing of the formation and hydro-sandblasting perforation» with the Federal Institute for the development of Education.
- Use of online educational programmes

Ensuring continuous monitoring of the innovative development of the oil and gas complex and mastering modern technologies.

- Implementation of a joint concept developed with the employers' enterprises in order to improve the level of training of personnel and to ensure, in conjunction with the oil and gas industry, the modernisation of continuous vocational training.
- Introduction of processes of invention and rationalisation of new samples of equipment and technology into the educational process, forming intellectual and value orientations of learners, providing them with social and value orientation component.
- The use of remote information and communication technologies of education as the most promising technologies among the whole spectrum of innovative technologies in the educational process (Volov, 2004).

The main pedagogical idea of creating, developing and modernising the model is the creation of organisational and pedagogical conditions for the continuous education and development of the individual through his or her life and the formation of motivational values, vocational values and intellectual and professional skills value-based and socio-value-based orientations in the context of public-private partnerships and online forms of educational programmes.

The motivation to learn and develop the personality of a professional is based on the desire to pursue a career. Developing and building an optimal career is a major challenge for young people in today's world. A career is an extension of independent work, goals, roles, even self-esteem and self-awareness. In choosing a career, the learner chooses the direction best suited to his personal values (Wang & Jen-De, 2019).

The monitoring of learning aims to support pedagogical approaches by assisting the teacher (Bull, 2016).

An experimental and control group of students has been selected to measure the effectiveness of continuing education. The Control Group was trained at the College in the model curriculum without the use of a web-based form, while the Control Group was piloted using a web-based form of educational programmes at the educational institutions of the College and the Technical College within the RC.

In the course of the study, a survey was carried out to determine the quality of continuing education for students of the experimental groups of educational institutions of the RC. The number of students interviewed was 206.

According to the results of the survey, 95 % of the students agreed on the need for continuous vocational training to enable them to achieve significant career development and to enable them to obtain two State diplomas.

Analysis of the control of knowledge showed that the majority of students of educational institutions of RC (96%) gave correct answers to the questions presented, which confirms the educational-practical effect of studying in the system of continuous vocational education.

In order to find out the value orientations of the educational institutions of the secondary vocational education RC, the authors conducted a pedagogical study in the form of a questionnaire based on B.S. Kruglov «Determination of the formation of value orientations» (adapted and modified version of the method by M. Rokich) (Волов & Волохин, 2019).

The results of the most important value-objectives (terminal values) were studied initially. Terminal values are the basic goals of a person; they reflect a long-term life perspective, what he aspires to now and in the future.

Table 1. Summary Table of Students' Terminal Studies

Terminal values (value-objectives)	Average number of respondents
1. Autonomy as independence in judgement and evaluation	4,2
2. Self-confidence (freedom from internal contradictions, doubts)	4,3
3. Material security (no material difficulties in life)	4,4
4. Health (physical and mental)	4,4
5. Pleasure (life full of pleasure, entertainment, pleasant time)	4,5
6. Interesting work	4,5
7. Love (spiritual and physical intimacy with a loved one)	4,4
8. Freedom as independence in deeds and actions	4,3
9. Beauty (experiencing beauty in nature and art)	4
10. Good and loyal friends	4,7
11. Cognition (possible expansion of education, outlook, intellectual development)	4,4
12. Happy family life	4,6
13. Creativity (creative opportunities)	4,2
14. Public recognition (respect for others, collectives, comrades)	4,2
15. Active, productive life	4,5
16. Equality (brotherhood, equal opportunities for all)	4,4

The next step in the study was to examine the results of the most important instrumental values. Instrumental values describe the means that are chosen to achieve the goals of life and reveal the basic qualities of a person. They serve as a tool through which terminal values can be realised.

Table 2. Summary Table of Student Tools Research

Instrumental values (personal qualities)	Average by group
High demands (high claims)	3,6
Sensitivity (Care)	4,2
Manners (good manners, courtesy)	4,5
Cheerfulness (sense of humor)	4,4
Efficiency in action (hard work, efficiency in work)	4,4
Courage to stand up for your vision, your opinion	4,4
Executive performance (discipline)	4,3
Intolerance of shortcomings of oneself and others	3,6
Open-mindedness (understanding other people's point of view, respecting different tastes, habits)	4
Honesty (truthfulness, sincerity)	4,4
Education (breadth of knowledge, high common culture)	4,2
Self-control (restraint, self-discipline)	4,3
Tolerance (to other people's views and opinions, to forgive others' mistakes, misconceptions)	4
Strong will (self-control, resilience to adversity)	4,2
Rationality (rational and logical thinking, informed decision-making)	4,2
Responsibility (sense of duty, commitment)	4,4

After updating and introducing the concept (2014-2020), the employment rate of graduates according to the employment service data is 100%.

The quality level based on the results of the independent evaluation of the quality of educational activity of the College and Technical College in the RC, which is carried out by the Regional Centre for Informatization and Assessment of Quality of Education and approved by the Ministry of Education and Science of the UR, 90.2% , which is higher than the quality level of other specialised institutions. The social impact of the model is due to the high rating of RC institutions among learners, parents and employers.

4. Summary

As a result of the network of secondary vocational education institutions of various forms of ownership, in cooperation with schools, specialised higher education institutions in RC and employers' enterprises on the basis of long-term mutually beneficial relations, the following are ensured:

1. A stable pool of staff, reflecting the high economic and social impact of the inflow of skilled and secondary vocational education;
2. At the Training Centre for Professional Qualifications of the College, the cost of training by employers participating in the project is practically on credit through extra-budgetary short-term training (retraining) of workers and specialists;
3. Entry into the labour market of highly qualified middle-level specialists from the non-State Technical College, with the issuance of a State-issued document. In this case, both the State and the enterprise do not bear the costs, realising the regional state order in specialists with a high-quality level;
4. The employer enterprise has the possibility of sharing the material and technical resource base of the RC complex;
5. Creating the conditions for dual education through contractual relations with employers on the basis of public-private partnerships;

6. The opportunity to receive continuous vocational and educational training at all levels of vocational education, thus implementing the principle of continuing education «lifelong education».

5. Conclusions

The results of the concept-based model are as follows:

1. The model of continuing vocational education under conditions of its modernisation and reform has been developed and substantiated based on the example of the oil and gas sector of the Udmurt Republic;
2. Indicators have been developed on the quality of graduates' training in the system of continuing vocational education: the level of achievement, the level of employment, and the level of satisfaction of employers with graduates of educational institutions of the RC;
3. The types of value orientations of students studying in the system of continuing vocational education for the orientation of students have been identified;
4. Specifics of the interaction of enterprises and educational organisations in the structure of the RC have been defined;
5. A positive trend has been observed in the quality of students' education programmes through the use of a network form for individual curricula and the variety of educational programmes;
6. Demand from the Udmurtia oil and gas industry has been positive;
7. Improving the quality of educational programmes through new professional standards and independent certification procedures.

The innovative nature of the model is determined by the fact that educational processes are analysed for the first time and conducted in conditions of public-private partnership and networking, with the participation of educational institutions of various forms of ownership, Within the RC, on the basis of the autonomous institution of the secondary vocational education and within the Training Centre for Professional (Applied) Qualifications, as a means of implementing State policy and the RC as a means of realising the corporate and sectoral interests of enterprises; providing continuous educational preparation of a person through his life (Volov et al., 2020).

As a result, it can be concluded that the model of continuing vocational education that has been established, under the conditions of existing and advanced modernisation, ensures a steady development in the interaction between the various structures of vocational education, the quality and effectiveness of continuing vocational education is improved by the State and by the enterprises concerned, reducing the time spent on training and making it more attractive to the population.

Acknowledgements

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

References

- Bull, S. (2016). Negotiated learner modelling to maintain today's learner models. *Research and Practice in Technology Enhanced Learning*, 11(1), 10. <https://doi.org/10.1186/s41039-016-0035-3>
- Drewery, D., Pretti, T. J., & Church, D. (2020). Contributions of work-integrated learning programs to organisational talent pipelines: Insights from talent managers. *International Journal of Work-Integrated Learning (IJWIL)*, 21, 275-288.
- Falk, J. H., & Dierking, L. D. (2019). Reimagining public science education: the role of lifelong free-choice learning. *Disciplinary and Interdisciplinary Science Education Research*, 1(1), 10. <https://doi.org/10.1186/s43031-019-0013-x>
- Horiguchi, T., Tomoto, T., & Hirashima, T. (2015). A framework of generating explanation for conceptual understanding based on "semantics of constraints". *Research and Practice in Technology Enhanced Learning*, 10(1), 2. <https://doi.org/10.1007/s41039-015-0002-4>

- Lim, S. M., Foo, Y. L., Yeo, M. F., Chan, C. Y. X., & Loh, H. T. (2020). Integrated Work Study Program: Students' Growth Mindset and Perception of Change in Work-Related Skills. *International Journal of Work-Integrated Learning*, 21(2), 103-115.
- Melash, V. D., Molodychenko, V. V., Huz, V. V., Varenychenko, A. B., & Kirsanova, S. S. (2020). Modernization of Education Programs and Formation of Digital Competences of Future Primary School Teachers. *International Journal of Higher Education*, 9(7), 2-9. <https://doi.org/10.5430/ijhe.v9n7p377>
- Volokhin, E. A. (2015). The federal standard is being designed in the region: the experience of Udmurtia. *Vocational education. Capital. - Moscow*, 12, 29-30.
- Volov, V. T. (2004). *Telecommunication technologies in vocational training*. - Samara: Ed. RAS, 100 p.
- Volov, V. T., Volokhin, E. A., & Volokhin, A. V. (2020). Functional features of continuing vocational education under conditions of modernisation and reform. *Vocational education and the labour market. - Mr. Yekaterinburg*, 2, 97-101.
- Wang, H. H., & Jen-De, C. (2019). What do you mean when you think of career? A prototype analysis of the conception of career among taiwanese college students. *Jiaoyu Kexue Yanjiu Qikan*, 64(2), 39-68.
- Волов, В. Т., & Волохин, Е. А. (2019). Модель непрерывного профессионального образования в условиях его модернизации и реформирования (на примере нефтегазовой отрасли Удмуртской Республики). Мир науки. Педагогика и психология, 6. Retrieved from <https://mir-nauki.com/PDF/89PDMN619.pdf>
- Волохин А. В., & Волохин Е. А. (2014). Концепция развития и модернизации модели многоуровневого непрерывного профессионального образования для нефтяной и газовой промышленности Удмуртской Республики в условиях его реформирования. Инновации в профессиональной школе: Приложение к журналу «Профессиональное образование. Столица». - Москва, 5.
- Горшков, М. К., & Ключарев, Г. А. (2011). Непрерывное образование в контексте модернизации. М.: ИС РАН, ФГНУ ЦСИ, - 232 с.
- Зайцева, О. В. (2009). Непрерывное образование: основные понятия и определения. Вестник ТГПУ, Выпуск, 7(85), 106-108с.

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).