

# Information Technology Importance in the Development of Learners' Professional Self-Identity

Lyudmila Mahleeva<sup>a</sup>, Valentina Kormakova<sup>a</sup> and Suhel Mustajab<sup>b</sup>

<sup>a</sup> National Research University "Belgorod State University", Belgorod, St. Pobedy, 85, 308015, Russia

<sup>b</sup> Aligarh Muslim University, Aligarh, Uttar Pradesh, 202001, India

## Abstract

This paper studies the role of information technology in the development of professional self-identity of high school students during a vocational training. The article presents the study on the development of professional self-identity indicators (high level of knowledge and skills acquisition; development of cognition interest in learning process; development of suitable self-esteem when organizing IT-based learning and professional activities of students. Information technology is an absolute requirement for organization of effective learning and professional activities in the times of IT-based education, the aim of which is to involve students in learning and research processes.

Mentoring of high school students for vocational training programs is carried out through the organization of professionally-based training with the help of information technology, which contributes to the development of students professional identity. By the development of professional self-identity we understand the process of a new formation when a person identifies himself with a certain "specialist ideal" of a certain professional community. It is the result of the student's awareness of his own personal and professional values during knowledge and labor skills acquisition, as well as the student's acceptance of values and functionality of the chosen profession [10; 17; 18; 24; 25]. Professional self-identity is important in helping students make a meaningful and responsible approach to the choice of subsequent training, getting vocational secondary education or higher education [7; 16; 21; 26; 28]. In the course of the research study, we concluded that the introduction of information technology in the learning process during a vocational training of high school students is one of the necessary conditions for the development of their professional identity.

## Keywords <sup>1</sup>

Development of professional self-identity, professional training of high school students, information technology, cognition interest, self-esteem.

## 1. Introduction

The present period of society development is marked by the increased influence of information technology that is widely used in all areas of life. The introduction of information technology in education allows to change the content, methods and forms of education. The aim of using information technology in education is considered to increase the quality of education and the activity of students in learning and cognition process, optimize the search for necessary information, develop thinking activities and master the skills of working with information and various software products [6; 19; 20]. One of the tasks of IT-based education is a transfer from coming through information technology to monotechnology, when teaching, monitoring, recognition, and managing an educational organization refers to the use of electronic computers [6; 19; 20].

SLET-2020: International Scientific Conference on Innovative Approaches to the Application of Digital Technologies in Education, November 12-13, 2020, Stavropol, Russia

EMAIL: mila.mahleeva@yandex.ru (Lyudmila Mahleeva); kormakova@bsu.edu.ru (Valentina Kormakova); cst01sm@gmail.com (Suhel Mustajab)

ORCID: 0000-0003-2695-3646 (Lyudmila Mahleeva); 0000-0001-7768-359X (Valentina Kormakova); 0000-0002-9969-6110 (Suhel Mustajab)



© 2020 Copyright for this paper by its authors.  
Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).  
CEUR Workshop Proceedings (CEUR-WS.org)

The problem of the use of information technology in education are carried out by Russian and foreign scientists Vagramenko J. A., E. P. Velikhov, B. S. Gershunsky, V. I. Gritsenko, G. R. Gromov, D. V. Zaretsky, E. V. Zvorygin, T. B. Kaziahmedov, G. Kleiman, O. A. Krivosheev, V. M. Monakhov, S. Papert, J. A. Pervin, B. Sendov, B. Hunter, V. F. Sholokhovich etc. Didactic problems of IT - based education in Russia are reflected in the research works of A. P. Yershov, A. A. Kuznetsov, I. V. Robert, G. K. Selevko, T. A. Sergeeva; methodological aspects of the problem are presented in the works of B. S. Gershunsky, E. I. Mashbits, N. F. Talyzina; psychological - in the works of V. V. Rubtsov, V. V. Tikhomirov and others [11].

"Information technology of training (ITT) is a set of methods and technical means of collecting, organizing, storing, processing, transmitting and presenting information that expands people's knowledge and develops their capabilities to manage technical and social processes" [11]. E. I. Mashbits and N. F. Talyzina consider ITT as "a set of training programs of various types: from the simplest programs that provide knowledge control to training systems that are based on digital intelligence" [11]. Sholokhovich suggests defining ITT from the point of view of its content "as a branch of didactics that studies a planned and consciously organized process of learning and assimilation of knowledge, in which IT tools are used" [11]. Hence, IT should be considered as an application of information technology for the formation of a new possibility in the field of knowledge transfer and perception, assessment of the quality of education and comprehensive personal development, which is a powerful tool for speeding up the learning process [1; 6; 11].

A great number of specialties and difficulties that young people face in self-assessment of professional abilities make the problem of professional self-identity very difficult for younger generation. Choosing a profession is an important period in the life of a school graduate as every person needs social approval, and financial independence. One way to achieve this is to identify yourself with a profession that brings emotional satisfaction [3; 4; 5; 17; 18; 27, etc.]. Professional self-identity is rather important as it helps young people to come to a meaningful and responsible choice of the direction of subsequent training, get vocational secondary education or higher education [7; 16; 21; 26].

Further education provides great opportunities for developing professional self-identity of high school students. The educational institution of further education gives opportunity for various educational programs and courses (basic, elective, etc.), thereby contributing to the development of students' abilities and interests. According to the Federal law "On education in the Russian Federation" (article 25, paragraph 4), "institutions of further education have the right to carry out educational activities for the implementation of vocational training programs, if this is not the main purpose of their activities" [12]. According to the Law, vocational training programs for professional training of blue- and white-collar jobs is "vocational training for people who previously did not have a profession of a worker or a white - collar position" [12]. The content of educational and professional activities organized in institutions of further education is to prevent "early profiling" of students, increase the choice, the probability of knowing themselves in the profession, pass professional tests, and, accordingly, identify themselves with the profession, which is extremely challenging [8; 9, etc.].

## **2. Research goals and objectives**

The paper aims to study the impact of information technology on the development of professional self-identity of high school students during vocational training. The development of professional self-identity of school students is promoted by fasting cognition activity; development of learning motivation; enhancement of learning results through the improvement of suitable self-esteem in the process of learning and professional activities.

The authors suggest that the use of information technology in the period of vocational training of high school students in blue - and -white collar professions will allow increase the learning motivation of senior students; develop professional interests; improve the quality of knowledge and skills in the profession being studied; improvesuitable self-esteem; develop the ability to acquire new knowledge independently, thereby contributing to the development of their professional self-identity.

### 3. Methods Development

The study was performed in the municipal budgetary institution of further education "Center for technical creativity and vocational training" in the city Stary Oskol of Belgorod region (MBIFE "CTC and VT"). This educational institution is the largest resource center for vocational training in Starooskolsky city district. The experiment involved 80 eleven graders from five general educational institutions (MBOU "SOSH #12 with UIOP", MBOU "SOSH #14" named after A.M. Mamonov, MBOU "SOSH #20 together with UIOP", MBOU "SOSH #21", MAOU "SOSH #27 with UIOP") of Stary Oskol, Belgorod region.

For the reliability of the obtained indicators all participants were divided into experimental and control groups by random selection. Forty students became part of the experimental and enrolled in the occupations of "Pastry- cook" and "Chemistry lab technician". The remaining forty made up the control group with occupation "Construction Painter" and "Sewer". Vocational training of high school students in experimental groups was IT-based.

To monitor the effectiveness of the use of information technology in the learning and professional activities of students in experimental groups, we identified the following set of diagnostic methods: questionnaire, conversation, observation. To determine the level of development of cognition interest, we used the questionnaire of K. N. Volkov [4]. The level of quality of students' knowledge was checked through the obtained certification data during the development of vocational training programs for the studied profession. When determining and adjusting the level of students self-esteem, a test questionnaire "Determining the level of self-esteem" was used (S. V. Kovalev) [2]. In the course of vocational training, educational and professional activities of students in experimental groups were organized by way of training sessions through electronic textbooks and multimedia encyclopedias on CD-ROMs, as well as computer training programs when explaining new material, consolidation, generalization and arrangement of knowledge. The electronic textbook provided assistance to the teacher in solving didactic, methodological and psychological problems, as it was the most flexible teaching tool that allowed to modify the educational material as necessary. The use of an electronic textbook made it possible for students to study new information independently at the same time as theoretical and practical classes under the guidance of a teacher, using the submitted electronic material in the format of a full-fledged textbook, as well as an assistant-consultant and examiner [15]. We used multimedia CDs in the form of text, graphics, audio and video information, which guaranteed the effectiveness of teaching students with different types of perception. In order to optimize the process of visual perception and increase the demonstration effect of the training session, the teachers of further education of the Center for vocational training in Stary Oskol, Belgorod region used: multimedia projector and interactive whiteboard (multimedia presentations, simulators), which significantly increased students' interest in classes and helped better assimilate the program material.

Multimedia presentations with elements of entertainment (enhanced by sound, graphics, and video information) affect the students much more than just the word. They generate a sincere interest in the studied educational material, a desire to learn and learn more; in the future, they develop a stable motivation to learn or master various practical skills. The most frequently used presentation programs in the classroom are Power Point, ProShow Producer, and LibreOffice Impress, shown in Fig. 1.



**Figure 1:** Programs for making presentations in vocational training sessions at the Center for vocational training (Stary Oskol, Belgorod region)

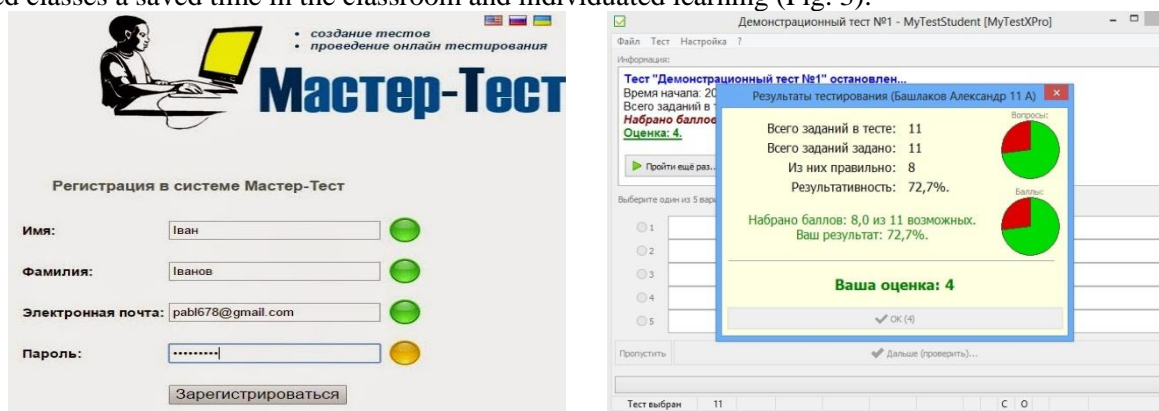
During the practical training sessions, teachers successfully applied the method of paper- and -pencil instruction using the following handouts: instructional and technological maps, diagrams, tables, task cards, self-assessment questions and a hot-seat questions (Fig. 2). The given method aims at independent mental activity of high school students when preparing the work-study.

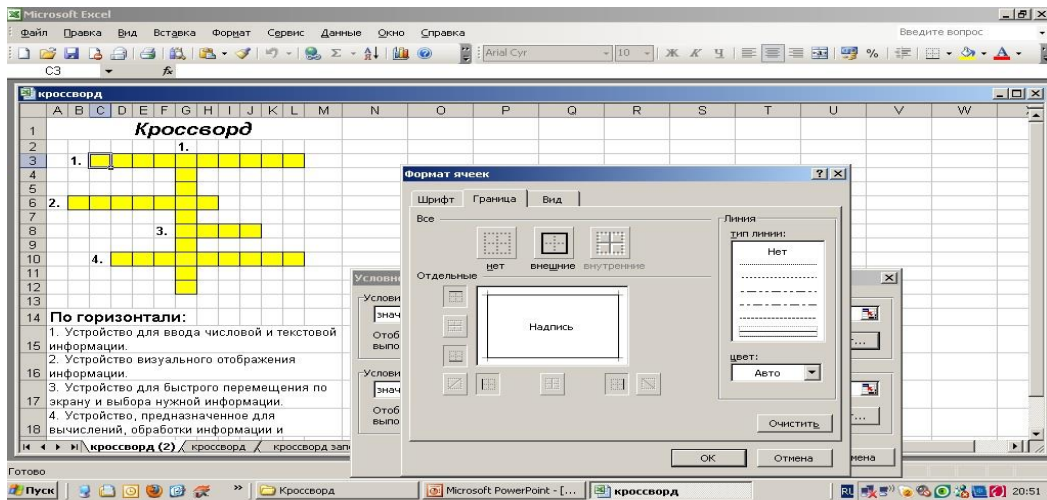


Figure 2: Educational learning material handout used by teachers in vocational training sessions

Internet resources, electronic encyclopedias and reference books were widely used in experimental groups during the training sessions of high school students. In addition to traditional texts, we used various modern technologies for making visual and audio sources of information to prepare learning materials: educational films; video and audio recordings in accessible form via remote Web resources [29, 30].

When monitoring high school students' knowledge and skills, we used computer –controlled monitoring with the use of testing programs in the Master-Test system. This is the basis for getting an objective independent assessment of the level of students' learning achievements (knowledge, intellectual and practical skills). In the course of our study, we assumed that computer tests and crossword puzzles created more positive emotions in students than the same tasks on paper, and IT-based classes a saved time in the classroom and individualized learning (Fig. 3).



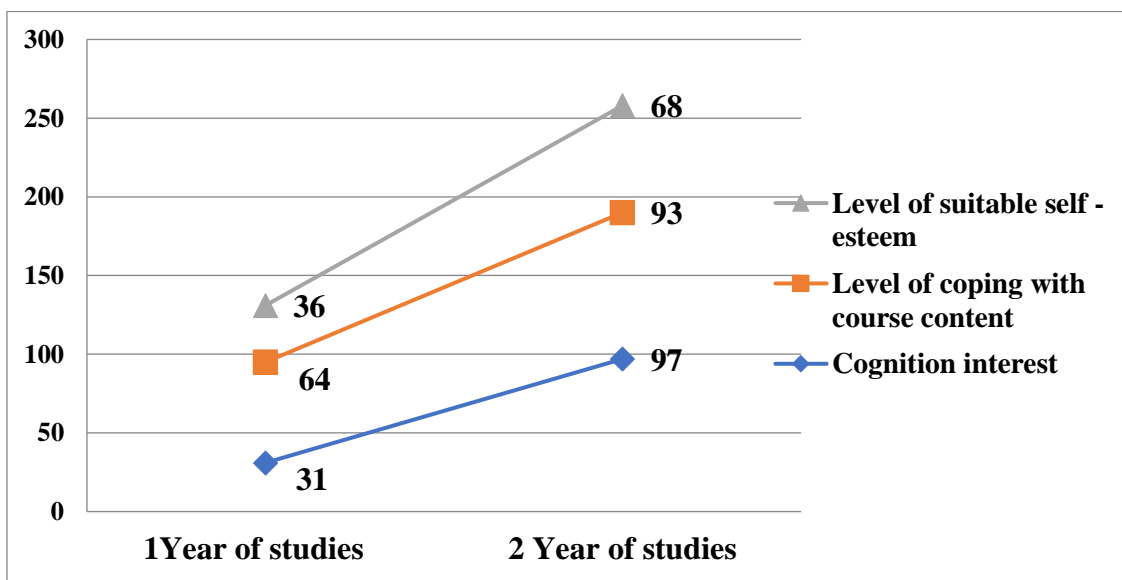


**Figure 3:** Tools for Computer -controlled monitoring of high school students ' knowledge in the vocational training sessions (Stary Oskol, Belgorod region)

The strength of using computer in experimental groups -controlled monitoring tools in the classroom made it possible to manage the learning and professional activities of high school students, thanks to which the teacher had the opportunity to interview several students in a group all at once, monitor their answers and accurately determine the causes of mistakes. Moreover, due to the use of test programs, the students controlled the results of their actions, assessed such features of their personality as the degree of motivation, the degree of suitability of self-esteem, which contributed to the reflexive development of high school students experimental group professional self-identity.

#### 4. Results

The results obtained during the study of the development of cognition interest indicators, the level of learning success and the developed self-esteem of high school students in experimental groups during a vocational training confirmed positive dynamics. All values are presented as a percentage (Fig. 4).



**Figure 4:** Results of professional self-identity of high school students in experimental groups (%)

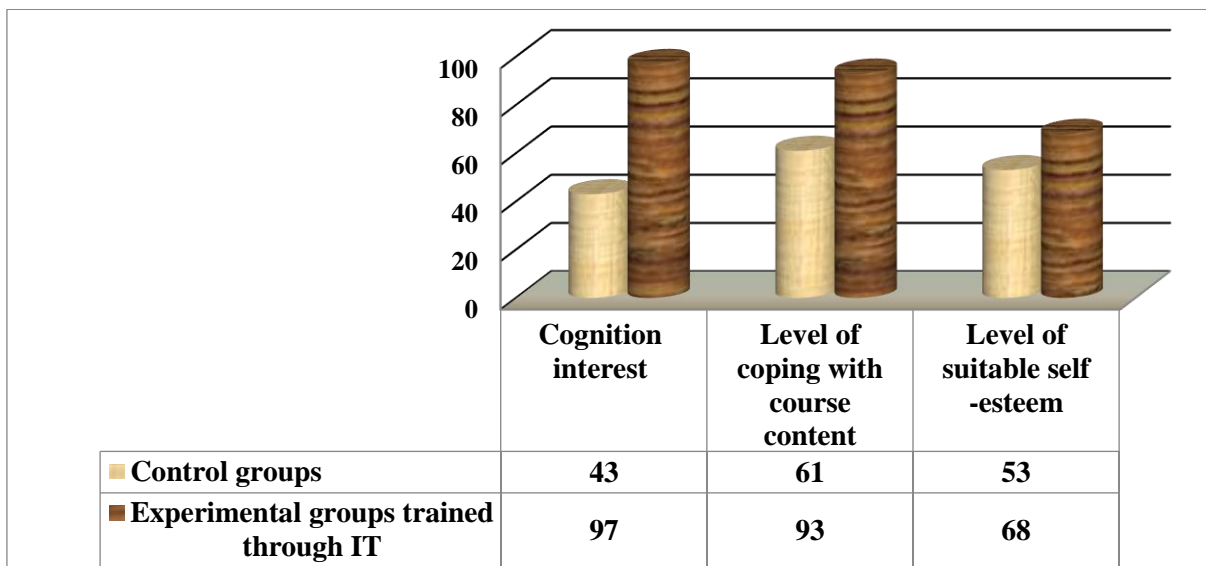
A comparative analysis of indicators of cognition interest, the level of learning success, and the developed self-esteem of high school students show that in experimental groups the given data were significantly higher due to IT - based vocational training. Thus, in comparison with the first year of



training, 66% of 40 high school students increased their level of cognition interest, and 29% of them improved their knowledge and skills of the profession they were studying. The increment in such an indicator as suitable self-esteem was 32% and this is due to the fact that students have a holistic view of the importance of learning and professional activities; correspondence of the available level of personal values with the necessary for professional activities; readiness to build projects of life and design life strategies.

The obtained data confirm that in experimental groups the level of development of cognition interest of high school students during IT-based vocational training increased three times. As a result, learning and professional motivation of high school students to master knowledge and basic skills in the chosen profession has significantly increased. Thereby the need to choose this exact profession has increased, which confirms the right development of indicators of motivational criterion for the development of professional self-identity of high school students. The analysis of students' certification materials obtained during their learning and professional activities confirm the growth. This fact indicates that students have mastered the theoretical knowledge of the profession and the ability to apply it in practice at the best possible level, which proves the development of indicators of cognitive and informational criteria for the formation of professional self-identity of students. Educational motivation regulates the success of students in learning, as a result of which the suitable self-esteem is developed. The development of suitable self-esteem of students in experimental groups contributed to: 1) arming the students with the sufficient amount of career guidance knowledge; 2) increasing an interest in the study and understanding of the individual as a subject of effort; 3) self-knowledge and control of their own capabilities.

To rely on the obtained results and identify the effectiveness of the IT-based training, we compared these indicators in experimental and control groups. Data on indicators of professional self-identity formation in experimental and control groups that were achieved at the end of the professional training period are presented in Fig. 5.



**Figure 5:** Efficiency of IT in vocational training of high school students (%)

The positive dynamics of indicators of professional self-identity of students confirmed the effectiveness of the use of information technology in high school students' vocational training. Arousal of educational and cognition activity of students in experimental groups is stated by a high indicator of cognition interest, which is 97%. This is significantly higher than the results achieved by the students in control groups (43%). The development of this indicator contributed to the formation of positive learning and professional motivation of students in experimental groups and, as a result, increased the level quality of knowledge, which amounted to 93%, against 61% of the level of mastering educational material by students in control groups. As a result of the development of cognition interest and increase of the level of students' learning material, there was an adjustment of their self-esteem, the indicator of

which at the end of vocational training achieved 68%. Self-esteem as an indicator of self-attitude, self-development, abilities and cognitive interest to the profession studied, directly influences to student self-esteem. During the diagnostics, we also stated that the use of information technology contributed to the development of students' information competence and ability to work independently.

Thanks to the applied information technology, such as social networks, e-mail and Skype, a feedback system, game-systems [22, 23] was established for the exchange of information between teachers, students and their parents, which contributed to the effective coordination of professional training process.

## **5. Discussion**

The use of information technology in professional training of high school students allowed to bring the student as close as possible to the development of program material, encourage their activity, experience a state of success and, accordingly, motivate their actions. With the help of information technology, the teacher made the training individual, taking into account the personality of the individual, interests and needs of each student. Moreover, the teacher had the opportunity to present the amount of program material in the best way possible; significantly increase visual perception, thoroughly facilitate the process of mastering learning material; develop the cognition activity of students. One of these means of information technology in the organization of learning and professional activities of high school students during professional training was the use of multimedia presentations in the classroom, which made it possible to display illustrative material on the screen at any scale. Also, the advantage of using multimedia presentations is that this tool is mobile and multifunctional in relation to both different stages and types of lessons. If necessary, the information displayed on the screen was provided piecemeal picking significant parts of it (font, color, graphic fragments, animation, music or voice accompaniment, etc.). Multimedia presentations in experimental groups made both theoretical and practical training sessions more interesting, rich and pictorial, and also contributed to the most optimal solution of the tasks set in the lesson. The possibilities of information technologies were used to create interactive homework assignments and simulators for independent work of students. Based on testing and assessment, computer tests and test tasks were used to perform various types of control and assessment of knowledge. The tests in experimental groups were performed online (performed on a computer in interactive mode, the results were analyzed automatically by the system) and offline (the results were assessed by a teacher with some comments and error analysis) [11].

The formation of professional identity of students was based on the following indicators: level of knowledge on the studied skills and the ability to use them in practice; the desire to obtain new information about themselves and the profession; the presence of cognitive interest in learning and the formation of adequate self-esteem of students [10; 13; 14]. Our research study allows us to state that the successful development of professional self-identity indicators in the process of professional training of high school students is possible in the conditions of professionally-based training through information technology.

## **6. Conclusion**

The performed experimental work has told that the most effective process for the development of professional self-identity of high school students is through learning and professional activities based on information technology. The research results proved the hypothesis: a successful development of professional self-identity of high school students in the process of professional training is supported by vocationally-based training through information technology. Summarizing the above, we come to the conclusion that the use of information technology in vocational training of high school students is one of the necessary conditions for the development of students professional self-identity.

## **7. References**

- [1] A. G. Asmolov, A. L. Semenov, A. Yu. Uvarov, Russian school and new information technologies: a projection into the next decade. Moscow: FIRO and VCRA, 2010.
- [2] S. V. Kovalev, Preparing high school students for family life: tests, questionnaires, role-playing games: a book for teachers. M.: publishing center "Academy", 1991.
- [3] E. P. Ermolaeva, Professional identity as a complex characteristics of the correspondence of the subject and activity, Psychological review (1998) 35-45.
- [4] V. N. Kormakova, E. I. Eroshenkova, Tutor support of professional self-determination of the individual in the system of interaction "school-university", Alma mater (Bulletin of the higher school) (2011) 40-44.
- [5] E. F. Zeer, Psychology of professional development: textbook for University students. Moscow: publishing center "Academy", 2007.
- [6] S. M. Konyushenko, Information literacy of a teacher in the light of the concept of human individuality, Computer science and education (2004) 102-105.
- [7] V. N. Kormakova, Designing life strategies as a factor of professional and personal development of students, Education and society (2018) 99-103.
- [8] L. V. Mahleeva, Organization of professional training as one of the directions of career guidance work of senior students in the conditions of further education, Problems of modern science and education (2016) 48-50.
- [9] L. V. Mahleeva, V. N. Kormakova, Self-organization of students ' educational activities, Professional education, Capital (2017) 13-16.
- [10] L. V. Mahleeva, V. N. Kormakova, M. A. Lapina, Reflexive formation of professional self-identity of schoolchildren, Bulletin of the North Caucasus Federal University (2020) 178-186.
- [11] O. I. Paschenko, Information technologies in education: Educational and methodological guide. Nizhnevartovsk: publishing house of Nizhnevartovsk State University, 2013.
- [12] Federal law No. 273-FZ of December 29, 2012 "on education in the Russian Federation", 2012. URL: <https://www.garant.ru/products/ipo/prime/doc/70191362/>.
- [13] T. D. Chesnokova, Study of the level of ambition and self-esteem in early adulthood in rural schools, Modern scientific research and innovation (2016) 38-42.
- [14] G. I. Shchukina, Pedagogical problems of formation of students ' cognitive interests. Moscow: Pedagogy, 1988.
- [15] E. V. Shchurova, Problems of distance learning in further vocational education, Level training of specialists: state and international standards of engineering education: proceedings of the scientific and methodological conference, Tomsk, 2011, pp. 164-165.
- [16] A.G. Asmolov, Russian school and new information technologies: focus on the next decade / A.G. Asmolov, A.L. Semenov, A.Yu. Uvarov - M. : FIRO and VTSRA, 2010.
- [17] E.H. Ericson, Identity: Youth and crisis. L. 1968.
- [18] E. Goffman, The Presentation of Self in Everyday Life / E. Goffman. - N. Y. 1959.
- [19] A.G. Klepikova, E.N. Musaielian, V.N. Kormakova, Yu.A. Prokopenko, Quality management principles of scientific and methodological support for students' activity within e-learning environment (2018) Proceedings International Multidisciplinary Symposium ICT Research in Russian Federation and Europe "Integrating Research Agendas and Devising Joint Challenges" (2018) 63-75.
- [20] V.N. Kormakova, A.G. Klepikova, E.N. Musaielian, Г.В. Baybikowa, M.A. Lapina, Formation of ICT – Competencies of postgraduate students of teacher education based on interactive techniques (2019) Proceedings International Scientific Conference «Innovative Approaches to the Application of Digital Technologies in Education and Research» (2019) 11-21.
- [21] J.E. Marcia, Identity in adolescence // Adelson J. (ed.). Handbook of adolescent psychology. N.Y. : John Wiley, 1980.
- [22] Aletdinova A., Konshina A., Lapina M. Implementation of the Gamification Method in the Development of a Distance Course "Crowdsourcing Management": CEUR Workshop Proceedings SLET-2019 – Proceedings of the International Scientific Conference Innovative Approaches to the Application of Digital Technologies in Education and Research, 2019. Pp. 60-69.
- [23] Rugej J., Lapina M. Game Design Based Learning of Programming: CEUR Workshop Proceedings SLET-2019 – Proceedings of the International Scientific Conference Innovative



Approaches to the Application of Digital Technologies in Education and Research, 2019. Pp. 29-42

- [24] A.N. Privalov, Y.I. Bogatyreva, V.A. Romanov, V.N. Kormakova, Safe information environment as a quality indicator of educational institution management // *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu* (2017) 140-144.
- [25] L.S. Vygotsky, *Pedagogical psychology*. - M.: Pedagogy, 2000.
- [26] A.S. Waterman, Identity development from adolescence to adulthood: An extension of theory and a review of research / A.S. Waterman // *Devel. Psychol.* (1982) 341-358.
- [27] Z.E. Yermolaeva, O.V. Lapukhova, Storytelling as a pedagogical technique for constructing educational tasks in a higher school // *Scientific-methodical electronic journal "Concept"*, 2016. URL: <http://e-kon-cept.ru/2016/16132.htm>.
- [28] Parfenov D., Zaporozhko V., Lapina M., Sora D. Development and Research of Algorithms for the formation the Individual Educational Trajectories of Students in the Digital Educational Platform: CEUR Workshop Proceedings SLET-2019 – Proceedings of the International Scientific Conference Innovative Approaches to the Application of Digital Technologies in Education and Research, 2019. Pp. 258-265.
- [29] O.P. Pankratova, E.A. Konopko, Remote training of teachers for IT navigation in inclusive education (2021) CEUR Workshop Proceedings, 2834, pp. 493-498.
- [30] Pankratova, O.P., Konopko, P.E., Nersesyan, E.V. Web technologies and services in the course of development of the interactive route «upland Crimea» (2021) CEUR Workshop Proceedings, 2834, pp. 499-507.