Conditions For Activating The Cognitive Independence Of Higher Education Seekers 0

Oksana Mishchenko[†], Tetiana Smyrnova [††], Tetiana Tkachenko [††], Olena Potamoshnieva[†††], Olha Yuzyk [††††], Yurii Berezhnyi[†††††]

[†] Department of Special Pedagogy, H. S. Skovoroda Kharkiv National Pedagogical University, Ukraine
[††] Department of Theory and Metodology of Artistic Education, Kharkiv I.P. Kotlyarevsky National University of Arts, Ukraine
[†††] Faculty of Preschool Special Education and History, Municipal establishment «Kharkiv humanitarian-pedagogical academy» of the Kharkiv regional council, Ukraine
[††††] Rivne regional Institute of postgraduate pedagogical education, Ukraine
[†††††] Department of Vocational Education, Hryhoriy Skovoroda University in Pereyaslav, Ukraine

Summary

The article defines the essence, structure and features of the teacher's methodological competence and determines the factors, content and functional characteristics of teaching structures as structure-forming components of education. The concepts and didactic potential and effectiveness of network communities in the formation and development of the methodological competence of the future teacher in the process are characterized and substantiated deployment of structures in the course of mastering activities.

Key words:
cognitive independence, competence, higher education, teaching technology

1. Introduction

Modern educational systems are complex synergetic systems, since they are open for development (correlatively depend on the needs of the labor market, economic indicators of the living standards of the population, etc.), are unstable and unbalanced (constant changes in training standards, curricula, workers programs, the emergence of new areas of training, etc.).

The competence-based approach to the education system presupposes significant changes both in the organization and content of the educational process, starting with the motivation of learning (the basis for the formation and development of sustainable interest among students), and in its assessment and correction.

The introduction of innovative forms and methods of teaching, in particular, the implementation of educational activities in a networked educational community, which belongs to synergistic systems, subject the educational system to fluctuations, which stimulates its process development and self-organization.

The provisions of the concept of development of methodological competence of students served as the basis for the development of three interrelated models: formation and development of the methodological competence of the future teacher of mathematics in the network community; a methodological scheme for the development of mathematical structures and a functional model of the information and communication educational environment.

The changes taking place in recent decades in Ukrainian society contribute to the fact that new teaching methods aimed at active, independent activity of students in acquiring new knowledge are increasingly replacing traditional methods, focused mainly on the reproductive learning activity of trainees. Graduates of universities, having a large baggage of professional knowledge, very often turn out to be professionally untenable in solving problems where it is required to show independence and competence, the ability to optimally organize their work and the activities of students [1-3].

The third generation standards provide for a decrease in the classroom load and a significant increase in the proportion of students' independent work. Therefore, the organization of independent work is of particular importance in the practice of modern education students using the services of the Internet, namely the Wiki environment [4-6].

In the psychological and pedagogical literature, independence is understood as the ability of an individual to carry out activities without outside interference. Cognitive independence, being integral part of

Manuscript received October 5, 2021
Manuscript revised October 20, 2021
https://doi.org/10.22937/IJCSNS.2021.21.10.34

independence as a personality trait, there is a personality quality that presupposes a person's ability to carry out cognitive activity on their own to solve any new cognitive problem [5-8].

In the article, the following research methods were used to solve the set tasks: theoretical (study and analysis of scientific and pedagogical, psychological and pedagogical, reference, specialized literature, regulatory documentation on the topic of research, additional professional advanced training programs; analysis, comparison, classification of the information received and generalization); empirical (pedagogical experiment, observation, questionnaire survey, survey, conversation, testing); mathematical (statistical data processing).

2. Theoretical Consideration

The use of Internet services in the educational process changes the traditional methodological system, affecting all its components: goals, objectives, content, methods and forms of education. This influence especially concerns methods and forms of teaching. In our study, innovative organizational forms are practical Web-workshops in the Wiki environment for the implementation of educational projects. Learning tools are Internet technologies and electronic educational-methodical complexes.

The organizational and managerial component includes the stages of the formation of the methodological competence of the future teacher: initial (1 course of study), basic (2-3 courses of study) and final (4-5 course of study). This component also includes two subsystems:

1. Subsystem of continuous monitoring of educational activities students. The functioning of this subsystem involves the creation of computer test tasks on mathematical structures and the methodology for their implementation in the learning process.

2. A subsystem for managing students' independent work, which is based on Internet technologies that optimize the cognitive process.
The productive-evaluative component reflects the requirements for the quality of mastering the structures, characterizes the levels of formation of the methodological competence of the future teacher and determines the criteria, indicators and diagnostic methods for tracking the results. This component is manifested in the student's mastering of the methodology for the implementation of his future professional activities in reflection of combining the goals of educational activities with the setting of educational and pedagogical tasks, assessing the resources at the teacher's disposal and rational organization of the process of solving the assigned tasks.

Implementation of a model for the development of methodological competence of a future teacher in the learning process of a future teacher structures based on a network community, consisting of a target, meaningful, procedural-activity, organizational and managerial and effective-evaluative component, will provide training of a specialist with a high level of methodological competence [3,9]

For the effective functioning of the developed model, it is necessary to take into account the following complex of pedagogical conditions:

1. Work on the formation of the methodological competence of students should be carried out continuously throughout the entire period of study at a pedagogical university.

2. Motivation in the expediency of using Internet services in the process of studying structures.

3. Creation of an active functional learning environment suitable for human-computer communication.

4. Interconnection of Internet services with other available types of ICT tools.

5. The need to take into account psychological and pedagogical aspects use of Internet services in the process of teaching the structures of future teachers.

6. Reasonable combination of traditional forms of education with network technologies and building on this basis of an integral effective methodological training system.

7. Compliance of training methodology using network services The Internet is a general strategy for conducting a training session.

8. The presence of a stable feedback in the educational process between the teacher and the learner, learner and learner.
9. Ensuring individualization and differentiation of training.
The pedagogical conditions defined above are, on the one hand, completely independent, on the other hand, interrelated and complementary, making up a single complex [4-7].
Projected theoretical model of formation methodological competence of the future teacher characterized by integrity (all selected components are interconnected, have a certain semantic load and are aimed at achieving the final result - the

training of not only a highly qualified specialist, but also the development of a creatively thinking personality capable of constant self-development); openness (model built into the context of the learning process management system), pragmatism (the model is a means of organizing practical actions, that is, a working representation of the designated goal); the presence invariant (the main goal and principles) and variable (means and mechanisms for achieving the main and intermediate tasks) components.

In the learning process, the development of independence should be carried out continuously, starting from the reproducing independence (the lowest level of independence), to creative independence (the highest level of independence). The simplest reproductive independence is manifested in independent the activities of trainees when performing mathematical tasks that require students to simply reproduce existing knowledge.

By creative independence we mean such the activity of students, as a result of which something new, original is independently discovered (for example, an original proof of a theorem, solving a problem, conducting one's own research, etc.).
For students studying in mathematical areas, in particular, its goal is to provide the student with sufficient experience of activities, including the application of the acquired knowledge to solve not only practical, but also theoretical problems.
Due to the abstract nature of the structures, their study is fraught with difficulties for most of the first year students due to their insufficiently developed skills of independent work.

Consequently, the teacher faces a problem, taking into account the peculiarities of the theory, of helping the freshman in the independent acquisition of knowledge and the effective organization of educational and cognitive activities.

There are the following types of independent work of students at a university, carried out under the supervision of a teacher: work (at lectures, practical classes) and extracurricular. [8-11]

Let's highlight the content elements of classroom independent work in the university: reading and analysis of mathematical texts; ability to compose lecture notes; analysis of tasks and examples; working out the methods of reproduction of the solution of typical problems; deep and detailed study of methods for solving problems.

We refer to independent extracurricular work: lecture material, performing tasks (proving the consequences of theorems, properties; carrying out the proof by analogy; restoring the missing part of the proof); exploring additional sources with their subsequent notes; study of material using electronic textbooks; preparation for practical training; implementation of network educational projects; performance of term papers and qualification works; preparation for tests, tests and exams.

In this regard, the question of the possibility of using Internet services, which significantly change the ratio between extracurricular and classroom work of students in favor of the former, is especially relevant. Availability and openness of the information resource provides students with the opportunity to carry out independent activities at a convenient time for them, and teachers provide remote access control over the independent work of students.

Independent work of students in the study structures in a university using the Wiki environment can be organized through the following system:

1) work with electronic textbooks posted on the website of the network community, using them in preparation for practical exercises;

2) implementation of individual and collective educational projects in the main sections of the theory;

3) computer testing;

4) implementation of individual consultations with teachers;

5) the implementation of term papers and final qualifying works with their subsequent presentation on the website of the network community for discussion [14].

Among the forms of organizing students' independent work that we have identified above, the most promising form is the use of the Wiki environment, namely Wiki-sites on which the teacher can post assignments for students to complete, make recommendations and proposals for their implementation. In the course of independent work, organized in this way, the student is involved in active cognitive activity focused on the formation and development of methodological competence. At the same time, students master a new type of activity in conditions of open access to information, get acquainted with new nonlinear technologies. Its very important feature is compatibility with all common operating systems, such as UNIX, Linux, Windows, Mac OS.

MOODLE is a European Learning Management System (LMS). It implements the philosophy of "pedagogy of social constructionism" and is aimed at organizing the interaction of teachers and students, the implementation of

distance learning courses carried out via the Internet.

The system is based on four main concepts: constructivism, constructionism, social constructivism, involved and abstract.

The essence of these concepts.
Constructivism. An individual "constructs" new knowledge for himself, interacting with the surrounding external world, comparing it with previously obtained knowledge.

Constructionism. The founders of this concept believe that the learning process will be more effective if the learner in the learning activity forms something for others.

Social constructivism. The essence of this concept is that the members of a certain group collectively form something for others.

Involved and distracted. This concept is related to a study of the motivation of participants' behavior in discussions. With "abstract" behavior, the individual seeks to be "objective" and "rely on facts", is inclined to defend his own considerations, trying to find weak points in the opponent's judgments. For the "involved" behavior is characterized by a more emotional approach that allows for subjectivity. In this case, the person tries to listen to the points of view of others and ask questions to better understand them.

The Moodle system assumes the existence of 3 types of users: administrators, teachers and students. The fourth type can be conventionally called a guest. Administrators have the most complete access rights to system and can affect any user registered in it.

Teachers have the opportunity to engage in course development and management of the educational process, i.e. influence student users [11-13].

The teacher also has student rights, i.e. there is a certain duality of this type of users. Students have the right to access to any courses, forums, as well as educational materials contained in the system, however, they do not have the right to make any changes to the system. Admin can allow or deny guest access for any visitor to the training site managed by the MOODLE system.

An important advantage of the MOODLE system is its free distribution and use, openness, mobility, portability, and extensibility.

Thus, the proposed scheme for organizing students 'independent work in studying the theory of mathematical structure on the basis of MOODLE is aimed at creative self-realization, at developing an individual trajectory for students' learning and allows solving the following tasks:

• increasing the efficiency of organizing students' independent work;

• activation of the processes of self-knowledge, disclosure of the practical significance of the material being studied;

• development of such mental operations and general skills as analysis, synthesis, comparison, analogy and modeling;

• transfer of the education system to a qualitatively new level, the most fully satisfying the needs of the post-industrial society - the training of a competence specialist;

• education of information culture of students and the formation of their methodological competence [14].

Conclusions

Educational network projects of students in the study of structures, implemented in the Wiki environment, simulate situations of educational activity with students, while the form of student activity changes to quasi-professional, which ensures the formation and development of professionally significant personal qualities of future teachers, the formation of methodological competence of the future teacher and the acquisition of professional experience. activities in network communities based on Internet services. Formation and development of methodological competence can be effectively carried out only in the case when the student, as a future teacher, will be involved in real educational and research activities related to teaching mathematics and, in particular, in the implementation of educational projects in the networked communities of the Internet.

References

[1] Corrall, S. (1998). Key skills for students in higher education. SCONUL Newsletter, 15, 25-29.

[2] Frolov, D., Radziewicz, W., Saienko, V., Kuchuk, N., Mozhaiev, M., Gnusov, Y., & Onishchenko, Y. (2021). Theoretical And Technological Aspects Of Intelligent Systems: Problems Of Artificial Intelligence. International Journal of Computer Science and Network Security, 21(5), 35-38. DOI10.22937/IJCSNS.2021.21.5.6.

[3] Meera N. S. Quality education for all? A case study of a New Delhi government school,

Policy futures in education, 2015, № 13 (3), pp. 360–374.

[4] Lazorko, O., Virna, Z., Brytova, H., Tolchieva, H., Shastko, I., & Saienko, V. (2021). Professional Safety of Personality: System Regularities of Functioning and Synergetic Effects of Self-Organization. Postmodern Openings, 12(2), 170-190. https://doi.org/10.18662/po/12.2/302.

[5] Alfred P. Rovai, Linda D. Grooms The relationship of personalitybased learning style preferences and learning among online graduate students. Journal of Computing in Higher Education. - 2004. - №16, Issue 1. - pp 30- 47.

[6] Andrea Santo-Sabato, Marta Vernaleone From the First Generation of Distance Learning to Personal Learning Environments: An Overall Look. ELearning, E-Education, and Online Training. - 2014. - №138. - C. 155-158.

[7] Shapiro, J., & Hughes, S. K. (1996). Information literacy as a liberal art: Enlightenment proposals for a new curriculum. EDUCOM Review, 31(2), 31-35.

[8] McMillan R. Man Builds Twitter Bot That Humans Actually Like. Wired. URL: wired.com/2012/06/twitter_arm/

[9] Mason, R. Globalising Education: Trends and Applications. London: Routledge, 1998. P. 37.

[10] Biddiscombe, R. (1999). Developing the learning support role: Some of the challenges ahead. SCONUL Newsletter, 16, 30-34.

[11] Iasechko, M., Shelukhin, O., Maranov, A. Evaluation of The Use of Inertial Navigation Systems to Improve The Accuracy of Object Navigation. International Journal Of Computer Science And Network Security, 21:3, 2021, p. 71-75.

[12] Dordick H.S., Wang G. The Information Society: A Retrospective View. Newbury Park — L., — 1993.

[13] Iasechko, M., Iasechko, S., Smyrnova, I. Aspectos pedagógicos do autodesenvolvimento de alunos de educação a distância na Ucrânia. Laplage Em Revista, 7(Extra-B), 2021, p.316-323.

[14] Lucia, A. D., Lepsinger, R. The Art and Science of Competency Models: Pinpointing Critical Success Factors in an Organization. San Francisco: Jossey-Bass/Pfeiffer. 1999. 212 p.