UDC 372.853 **DOI: 10.34670/AR.2022.88.92.044**

The practical focus of the content of continuing education for teachers of physics

Zarifa V. Damirova

PhD in Physics and Mathematics,
Associate Professor of the Department of Informatics
and General Technical Science,
Azerbaijan Cooperation University,
AZ1106, 93, Narimanova str., Baku, Republic of Azerbaijan;
e-mail: zarifadamirova@hotmail.com

Abstract

The article reveals certain aspects of the content of advanced training programs for teachers of physics and astronomy in the context of the introduction of the new Procedure for advanced training of teaching and scientific-pedagogical workers. The laying of knowledge, abilities, skills, the formation of the necessary competencies in a school graduate is carried out in the course of the educational process by a team of teachers from various educational sectors. The educational process in physics in this context is the leading one, since the goal of education is the formation of competence in natural sciences, engineering and technology, environmental competence and the development of other key competencies of applicants for education. Physics teachers are primarily involved in the implementation of the goals and objectives of the natural area at school. Therefore, their high-quality postgraduate pedagogical education is the key to obtaining knowledge from a school graduate in accordance with the current requirements of society. The purpose of the article is to reveal certain aspects of the content of advanced training programs for teachers of physics and astronomy. The article used methods of analysis, comparison and synthesis, and also empirical ones, in particular, observation of the work of teacher-methodologists, which was aimed at introducing innovative pedagogical ideas in the process of improving the qualifications of physics teachers. The author proposes solutions for organizing advanced training courses for teachers of physics and astronomy in accordance with modern world trends in education.

For citation

Damirova Z.V. (2022) The practical focus of the content of continuing education for teachers of physics. *Pedagogicheskii zhurnal* [Pedagogical Journal], 12 (2A), pp. 91-102. DOI: 10.34670/AR.2022.88.92.044

Keywords

Interactive learning, qualification, professional development, pedagogical education, creativity, cognitive activity.

Introduction

According to some scientists, cognitive activity is a significant component of cognitive activity. We found out that the latter in psychological and pedagogical studies is considered in the following aspects: cognitive activity is a component of cognitive activity (L. Ovanova, O.V. Sergeeva, I.F. Kharlamov, T.I. Shamova, G.I. Schukina), cognitive activity – one of the personality traits (I.Ya. Lanina, G.I. Schukina), cognitive activity as the readiness of the individual to cognition of the external and internal world (N. Zvereva, I.Ya. Lanina, I.F. Kharlamov, T.I. Shamova and others) [Dokuchaeva, 2007; Zvereva, 1980; Podlasyi, 2004; Svechnikov, 1999; Doronina, 2011; Simonenko, 2014].

The main part

L.A. Lisina in her thesis considers the cognitive activity as "an integral formation of the complex personality, which includes motivational, meaningful and operational second and emotional-volitional component and sold through cognitive needs, the initiative of cognitive suprasituationals, transformability, self-actualization, self-requlation" [Lisina, 2000].

T.I. Shamova identifies three levels of cognitive activity of students: the first level – the reproductive activity; the second level is interpretive activity; the third level is creative [Shamova, 1982]. Given the features of teaching physics, M.P. Rudenko considers it expedient to introduce the fourth level – the passivity of cognitive activity, "which will allow not only to assess the level of activity, but also to detect it's absence" [Rudenko, 1999].

We agree with N.L. Sosnitskaya, who believes that "the activities of the approach involve a combination of the following: cognitive, comprehension, memorization, application in practice, deepening" [Sosnitskaya, 2002].

The purpose of the article is to determine the degree of applicability of the activity approach in the professional development of teaching physics.

Graduate school teaching institution receives knowledge in basic sciences, such a mathematics, physics, history, biomechanics, psychology, pedagogy, methods a learning subjects of his specialty, and others. With this baggage, he starts to fulfill their professional duties in school, Vocational school, preschool, or out-of-school educational institution. If the amount of knowledge in mathematics, physics, geography and other sciences does not increase so quickly that they need to be updated immediately after graduation, then such sciences as computer science, psychology, and teaching methods develop quite quickly. Even with this in mind, the teacher cannot always cope with the performance of duties at the proper level. There is a need to improve his skills.

One of the features of working with adults, as pointed out by V.I. Putzov, is their focus on the instant application of learning outcomes. On this basis, it is advisable to use methods of interactive learning that are appropriate to the nature and characteristics of adult learning. They allow not only to optimally consider the educational needs of an adult, but also create the conditions for a permanent, systematic analysis of one's own actions. Interactive learning can avoid the appearance in the minds of teachers of patterns, stereotypes in relation to professional activity.

The concept of "interactive learning" in science is considered as:

Training, in-depth communication; retains the ultimate goal and the main content of the educational process, but modifies the forms from translational (transmitting) to dialogical, that is, based on mutual understanding and interaction;

A special form of organization of cognitive activity, has a specific, supposed goal – to create

comfortable learning conditions, in which everyone feels his success, intellectual ability.

The organization of interactive learning involves modeling life situations, the use of role – playing games, a general solution to the problem on the basis of an analysis of the circumstances and the relevant situation. Interactive training effectively promotes the formation of skills and skills, the development of values, creating an atmosphere of cooperation and interaction.

Interactive methods of postgraduate education are considered as a system of subject - subject relations (teacher of the postgraduate education system and teacher), the basis of which is the teacher's mastering of methods, teaching aids, the theory of their use for the implementation of the education mission presented for the educational purposes of the subject [Zvereva, 1980, 117].

No less important for passing the refresher courses is the reflective activity of the listener – teacher of physics as an integral attribute of the process of developing his professional competence.

In modern science the concept of reflexion is used in two basic meanings. First, reflection is related to the self – consciousness of the individual. Reflection is the principle of human thinking, guiding it to comprehend its own prerequisites; a substantive examination of knowledge itself, a crystal analysis of its content and methods; activity of self-knowledge, revealing the inner structure and specificity of the spiritual world of man. Secondly, reflection is considered as a process of reflection by one person of the world of another person. Reflection is not only knowledge and understanding of the other, but also the knowledge of how this another person understand the "reflexive" individual [Dokuchaeva, 2007].

The key problems of reflection in teaching are two directions: ontological (related to the content of subject knowledge) and psychological (that is, turned to self – knowledge and knowledge of one's activity) [Lanina, 1985, 16].

Pedagogical reflection is connected with the peculiarities of the content of pedagogical activity of colleagues, and on the activity of students. By its own activity pedagogical reflection is characterized by the awareness of its own pedagogical experience, the development of success criteria, the analysis of changes that occur in one's own education [Doronina, 2011]. Reflection as one of the properties of a feature is the basis of its self – development, openness to new experience, to other people; professional reflection provides the teacher with accumulation of new experience, the development of an individual style of pedagogical activity, is very important in the context of this professional development [Ivanova, 1983, 141].

In addition, it should be noted that in the modern world, the informatization of education is one of the priority areas for the modernization of the domestic education system, the preparation of a person for life in the information society, considering the essence of global transformations. This puts a certain number of requirements for the physics teacher: he must be able to work with computer equipment, own certain information and computer technologies. Accordingly, the training of physics teachers in refresher courses should be directed to the following areas: preparation for the use of information media as a means of effective teaching of physics; conducting master classes on the teaching of various topics using information technology during demonstrations; conducting master classes, laboratory works or physical workshops with the use of innovative technologies; gaining skills in working with innovative technologies to monitor and direct students' work.

So, within the framework of modernization of refresher courses for teachers of physics in the regional institute of postgraduate pedagogical education, it will be expedient to increase the proportion of activities aimed at realizing the intellectual potential of the teacher on the basis of subject – subject relations, dialogue and exchange of experience with colleagues, in particular, improving his thinking, reflexivity, readiness to work with computer technology and its wide use in physics lessons.

To the factors that cause this need, we should add the following:

– the development of society from time to time requires the reform of the education system, which, first of all, consists in changes in its conceptual framework, which, in turn, leads to changes in the content of curricula and plans;
– existing ones are being improved and new forms, methods and methods of teaching students are emerging;
– didactic, in particular, technical training aids are being developed;
– the ways of evaluating students' learning achievements (exams, testing, etc.) change;
– there are differences in the physical and mental development of each next generation of children who come to school;
– changing motifs teachings requests for education, and so on [Petersen, 2005].

A certain length of service in the system of postgraduate pedagogical education of Azerbaijan allows the author to suggest some ways of solving problems related to the professional development of the teacher. Let us consider them in more detail.

Over the centuries, there have been significant changes in socio-economic formations, science, production, and, with what cannot be ignored, in human psychology. The system of psychological and pedagogical influence on the younger generation could not help changing too. Along with the teacher, there were comprehensive media outlets that often work against what the teacher says. It should consider the fact that the education system fulfills the order's society emanating from modern production requests, education, culture, health, etc., while remaining itself, to some extent conservative. It almost always lags behind the development of science and technology, because it relies only on existing achievements. So, for example, while the semiconductor technology has reached a significant development, the programs of technical universities, not to mention pedagogical ones, have long acquainted students with vacuum devices (lamps) for quite a long time. To the full, this has to do with school curricula. Change them quickly fails, because they have already written textbooks, methodical aids, produced other didactic means. However, with the news, of science, technology, literature and art, it is possible to familiarize teachers with courses to improve their qualifications, introducing for this purpose appropriate special courses or electives [Botkin, 1979].

As already mentioned above, all the time the development of new organizational forms, methods and methods of training. The knowledge paradigm of education is moving to the background. More and more attention is paid to the development of a child received in the hereditary factors and the ability of it's suitable. There were scientifically justified new approaches to the development of creative abilities of pupils. If earlier it was believed that to develop the creative abilities of a person it must be involved in the solution of creative tasks (here, the tasks related to the unknown for the subject algorithm and their solutions were referred to the creative category), now it is already considered that a person should develop a sense of harmony them it will be a way to detect a certain disharmony between the elements of the system. Knowing this, teachers can organize appropriate work with students and develop their own creative potential. The lesson is no longer the sole and personified didactic unit. There is an independent work of students, their research activities.

The development of didactic, in particular, technical training facilities (TSS) has been about recently not in the direction of developing fundamentally new instruments, for example, devices for demonstration and laboratory experiments in physics and chemistry, but by introducing computer technology (CT) into the educational process, and pedagogical software (PPC). Electronic variants of graphic images, for example, drawings and photographs of certain natural phenomena that are easily

displayed on the monitor of a personal computer (PC) or with the help of an appropriate projector on the screen, have successfully replaced slides for the demonstration of which a graphical projector and a projector were used to show individual slides and filmstrips. The same can be said about the demonstration of dynamic images. CT minicameras replaced with film print (remember what difficulties were at the teacher when the film is in the loading mechanism "CAT" type movie camera, "Ukraine", "Rainbow" et al.) [Fatkhutdinova, 2012].

Teachers can use the PP of C. They allow you to perform a virtual experiment in physics and chemistry, generate tests, develop lessons and the like.

CT and modern communication facilities allow both the teacher and the student to use the Internet network. Of course, there is much useful in this network: you can download some works of art, textbooks, copies of scientific journals, task texts and solutions, methodological developments, PC software, video films, in particular, educational and development content, images of nature phenomena and so on. So, for example, by typing in the search engine of the Web site Fotolia.com number 9052222, you can open the photo of the author of the article, and clicking on the inscription The physicist, it will be possible to go to all of his portfolio, which contains pictures of physical phenomena of nature and biological objects. You can do the same on the Dreamstime Web site.com. To open the author's portfolio, enter the number of one of the author's photographs in the search system, for example, 10036165, after which you can go to his portfolio [Neill, 2009].

It is worth mentioning that we already have positive changes in the use of the PC in the educational process. If a few years ago in the teacher training courses we taught them how to work, mainly in the text editor World, introduced the capabilities of the program for presentations Point, a program for creating Publisher publications, now thy are interested in the proses of creating, programs for processing data of physical or chemical experiments, and the like [Salomon, 1984].

If a PC or a PC together with a projector and a screen is considered as a technical tool, which training makes more obvious, then some reservations should be made about this. In his work "The Problems of Learning and Intellectual Development at School Age" the famous psychologist L.S .Vygotsky writes that such a system of education, which is based solely on visualization, and excludes from teaching everything related to abstract thinking, not only does not help the child overcome their natural disadvantage, but also fixes this shortcoming, accustoming the child exclusively to thinking clearly must and drowns in it are weak beginning of abstract thinking, although it is contrary to the established in our minds ideas about the use in the educational process visibility (the more the better), but to the psychologist believes it is better to at least listen to our students a positive attitude not only to the books e pages which a lot of drawings, and evaluated it for content. At the same time, which is much more important, it is impossible not to pay attention to the information load of the processing of visualization as graphic information. The graphic image is formed due to a large amount of data, it is visible, even by the volumes of graphic files and requires a significant resource of the human cerebral cortex for their processing. For a better understanding of what has been said, let us use the computer analogue of the human cerebral cortex - the processor of a personal computer (PC). Open in Photoshop a certain graphic file and we will edit it, that is, change it. Press Ctrl + Alt + Delete and in the task manager window enable the "Performance" button. In this window, we will see that during the movement of the brush over the image, the PC processor will be loaded much more compared to the case of working in a text editor. The same can be said about the perception and processing of a graphic image by the human brain. Especially it is felt in case of dynamic images. If, in the process of processing data that form a graphic image, or participate in its perception, add another psychological factor of perception of such information, which is associated with emotions, then we easily understand why after

watching an hour and a half a person becomes very tired. Obviously, this must be considered when using modem multimedia tools in the teaching and educational process.

In the last decade digital photography and video equipment have also been distributed. A significant number of student s use mobile phones with them arranged in the photo and video cameras that can be used in the IP follow the phenomena of nature [Danil'chuk, 2001].

Visiting us with lessons in general educational institutions shows that most teachers prefer passive activities of students (read, write, listen).

The study of the state of mastering by students of the 8th and 11th grades of all sections of the course of physics on individual indicators produced the following results: pupils are poorly educated in the principles of action and designations of devices studied in physics lessons; they experience problems in reading technical schemes and instructions.

That is, the level of polytechnic education of students does not correspond to the current state of technological development of society.

This situation is explained as an objective reason, the lack of sufficient training equipment; and subjective does not fully apply methods that provide process of activity.

The problem of the activity direction of the process of teaching physics is completely associated with the content of the upgrading of the teacher of physics. During the course, the teacher should receive not only theoretical knowledge about the provision of an activity approach in teaching students to physics, but also practically to be in the role of a student.

The formation of a teacher takes place depending on the conditions in which he falls and considering his personal qualities. As a result, his professional activities are divided into three levels: operational – it's an employee performer; tactical – active worker; strategic – creative worker [Kuz'minskii, 2003]. With the upgrading of the qualification of the teacher of any level, the main thing is the value saturation of the content of the classes. For the teacher of physics of knowledge is not only knowledge, but it is also the pedagogical means for teaching [Dokuchaeva, 2007].

So, the result of the valuable areas of content refresher teacher of physics, in our opinion, should rather be to transfer him to a material that contains a dialogue of sciences and humanities cultures. The transmission path is an imitation game that stimulates performances.

Among such motivational tasks may be the study, say, of the golden section. The famous scientist Pierre Curie formulated several ideas of symmetry. He argued that one cannot consider the symmetry of any body, not taking into account the symmetry of the environment, she obeys: twisting rape, snails, cobwebs; location of seeds in sunflowers, needles on cacti such as Mamillaria.

Not just a shell of a bird's egg is designed. It is a crystal growing in organic tissues, plants as well as minerals from which teeth, bones, mollusks, etc. are composed. Its internal structure differs from crystals existing in inanimate nature. The Dutch researcher Wilhelm Natusis (second half of the 19th century) claimed that the shell is a living tissue, although cell-free. This was viewed skeptically by his contemporaries.

At the end of the 20th century, the shell was examined in polarized light in a microscope. Its individual parts look like ordinary spherical crystals. Moreover, they are located along the symmetry and golden section. This fact reflects the deep levels of unity of living and non-living matter. The tendency of nature to spiral movement, which attracts the eye and corresponds to the golden proportion, was emphasized by Goethe. At the end of the acquaintance with the golden section, the teachers are offered the task: "It is known that when lifting to a height h from the earth's surface, the acceleration of the free fall of bodies decreases and the value of the acceleration of the earth's gravity decreases as we approach the center of our planet. There are such points and where they are? Consider that the Earth

has the shape of a sphere and its density is the same throughout the volume" [Novikov, 1999].

The answer is: h = 0.618R, the number m = 0.618, and R is the radius of the Earth.

Another example of activity that has activity direction, a simulation game, a tour in history of science and technology.

Teachers offer the role of guides in the imaginary halls of the museum:

– Hall 1 – outstanding achievements of physics in the XX century;

– Hall 2 – the history of the development of science and technology in Russia;

– Hall 3 – old appliances.

The museum's exhibits can be photocopies of scientific works of scientists; their portraits; models of research installations; video films, materials of correspondence of scientists with relatives, colleagues, friends; posters with their aphorisms and sayings.

The purpose of such a lesson is to increase the activity of the trainees. And it is necessary to find some facts from the history of science; work in libraries; in archives, on the Internet.

The material selected for the lesson should:

– Be understandable to students;

– conform to the curriculum in physics;

– promote students' interest in physics as a science is, and its history;

– be axiologically and directed.

Being in the hall 1 of an imaginary museum, listeners learn about the cardinal changes in the development of civilization, caused the development of physics in the XX century. Among them: nuclear power, radio, television, computers, laser, telecommunications, aviation, space exploration and numerous methods of medical diagnosis and treatment.

The story of the guides is accompanied by a demonstration of portraits of those scientists whose scientific ideas formed the basis for these achievements.

In Hall 2, materials on the activities of the society of nature lovers, which existed in Russia in the XIX-XX centuries, were collected; on the contribution of M.M. Benardos (electric arc welding of metals) to the world science and about the activities of the director of the first in Russia missile plant of I. Konstantinov.

The Nikolayev Observatory occupies a significant place in science both today and in the XIX-XX century. Two small planets were named after Professor of Astronomy at Moscow State University N.D. Kalinenkov (2002) and the city of Nikolaev (2000).

Demonstration of old household appliances in Hall 3 occurs with methodological support: when studying which physical laws it is desirable to use this material? Products: rocker RUB e 1, comb for manufacturing filaments from flax, iron, forks, mortar, trough for mixing dough, wood grindstone, wood, and other chum.

In an adult, like a child, the eye organs let in the brain almost 5 times more information than the hearing organs and almost 13 times more than the tactile organs [Lanina, 1985]. Therefore, in most classes during the courses of physics teachers, the principle of visibility should dominate. Information entering the brain through an optical channel does not require recoding, it is imprinted in memory easily and quickly.

Organized so that training of teachers of physics, namely, the use of knowledge as a learning tool provides proactive and creativity in professional work.

Each teacher reports on the refresher courses for his creative work, in which he analyzes a certain problem and suggests ways of solving it. A significant part of such works is methodical

recommendations for other teachers. The main provisions of each work are discussed at conferences on the exchange of experience and under the final lesson. The descriptions of these works remain in the institute and are accessible to all other teachers. Individual teachers publish their materials in methodical newspapers and magazines, and post them on Web sites.

In the process of preparing teachers of physics, intellectually competitive games, the conduct of a "scientific and technical trial of an idea" can become a means of comprehensive development of creative activity.

They include simulations that help reveal the essence of the teaching of law, and consider the formation of legal thinking [Podlasyi, 2004].

Other gaming technologies, for example, the development of cases on the problems of jurisprudence, provide an opportunity for students of higher education courses to perform different roles and represent the interests of all parties. In the examples of active teaching methods considered, the leading role is given to information technologies and the dominant role is played by the teacher-faculty (communication intermediaries), which effectively contribute to the formation of the qualification characteristics of the personality as a specialist in a certain industry capable of innovative actions [Kuzminskii, 2003].

With the introduction of distance learning, many universities are already using the technology of an online seminar called webinar, which demonstrates comparative tables, presentations, videos and the like.

With the help of Internet technologies, the webinar retained the main feature of the seminar – interactivity, which provides modeling of the functions of the speaker, listener, who will interact interactively, communicating together according to the scenario of such a seminar [Zvereva, 1980; Rudenko, 1999].

Practitioners have also developed and experimentally tested the model for organizing independent work for students of extramural courses, which includes three stages: indicative (preparatory), activity (executive), control-correctional (final) [Ivanova, 1983]. The model is aimed primarily at ensuring an increase in the level of individual psychological preparedness of teachers for independent learning.

In addition, revealing the active methods of training applicants for advanced training, it is also necessary to pay attention to the issues of socio-psychological training, in which the active principle of each participant is the basic principle. The essence and classification of training, the main types of exercises and procedures, the stages of training work, etc. are reduced to "feedback", which consists in expressing each participant's own opinion on certain issues of the training session. Inclusion in the educational process of active forms of education, including psychological training, significantly affects the development of professional and personal qualities of the specialist.

Conclusion

Based on the foregoing, several conclusions can be drawn.

Thus, the structure and essence of the innovative educational process corresponds to the nature and speed of social changes in society, to high European standards of training specialists of an innovative type. So, the current content of education should focus on the use of technologies, the dissemination of interactive, e-learning with access to digital resources and intelligence-training for the future. In this regard, urgent solutions require such pressing issues:

1) amending the Regulations on the organization of the educational process of the university;
2) foreseeing the mechanisms for promoting online learning (e-learning);

3) normative regulation of the use of electronic educational and methodical resources in the educational digital space of the university;

4) the development of new programs, including the basics of Internet security, social communications in teacher training;

5) introduction of training materials and products of the new generation in accordance with the requirements of the modem economy and the social demand of the labor market.

The system of postgraduate pedagogical education requires further development, because it is more dynamic and closer to the needs of the teacher.

To conduct classes in teacher training courses, teachers of pedagogical innovations or those teachers who already successfully use them in their practical activities should be involved (the material is better understood).

The institutes of postgraduate education should be to create a library (instead of the well-known at the time of Film) in which the second would be not only a scientific, non-fiction movies, but also video lessons teachers – Media advanced pedagogical experience.

In the execution of course and diploma the students of pedagogical universities and colleges should use descriptions of the materials of advanced pedagogical experience that exist in the institutes of postgraduate education.

References

1. Akhmerova N.M. (2003) Lichnostno-deyatel'nostnyi podkhod k kontekstnomu obucheniyu sotsial'nogo pedagoga [Personal-activity approach to the contextual training of a social teacher]. *Pedagogika* [Pedagogy], 5, pp. 55-60.
2. Azimov E.G. (2014) Massovye otkrytye onlain-kursy v sisteme sovremennogo obrazovaniya [Massive open online courses in the system of modern education]. *Distantsionnoe i virtual'noe obuchenie* [Distance and virtual learning], 12 (90), pp. 4-12.
3. Botkin J.W. et al. (1979) *No Limits to Learning*. Oxford.
4. Danil'chuk V.I. (2001) Professional'no-pedagogicheskaya napravlennost' prepodavaniya fiziki v pedvuze v usloviyakh gumanitarizatsii obrazovaniya [Professional and pedagogical orientation of teaching physics in a pedagogical university in the conditions of humanization of education]. *Pedagogicheskoe obrazovanie i nauka* [Pedagogical education and science], 2, pp. 41-46.
5. Dokuchaeva V.V. (2007) *Teoretiko-metodologicheskie osnovy proektirovaniya innovatsionnykh pedagogicheskikh sistem. Doct. Dis.* [Theoretical and methodological foundations for the design of innovative pedagogical systems. Doct. Dis.]. Lugansk.
6. Doronina N.N. (2011) Organizatsiya uchebnogo protsessa v vuze s ispol'zovaniem aktivnykh metodov obucheniya: metody obucheniya studentov v vuze [Organization of the educational process at the university using active teaching methods: methods of teaching students at the university]. *Sotsiologiya obrazovaniya* [Sociology of Education], 3, pp. 31-38.
7. Fatkhutdinova O.V. (2012) Vprovadzhennya novikh tekhnologii v protsesi pidgotovki spetsialistiv pravoznavstva [Implementation of new technologies in the process of training law enforcement specialists]. *Gumanit. visn. Zaporiz. derzh. inzh. akad.* [Humanities Herald of ZSEA], 48, pp. 35-39.
8. Isaev D.A. (2003) *Komp'yuternoe modelirovanie uchebnykh programm po fizike dlya obshcheobrazovatel'nykh uchrezhdenii na osnove personifitsirovannykh znanii. Doct. Dis.* [Computer modeling of curricula in physics for educational institutions based on personalized knowledge. Doct. Dis.]. Moscow.
9. Ivanova L.A. (1983) *Aktivizatsiya poznavatel'noi deyatel'nosti uchashchikhsya pri izuchenii fiziki* [Activation of cognitive activity of students in the study of physics]. Moscow.
10. Kharlamov I.F. (1999) *Pedagogika* [Pedagogy]. Moscow: Gardariki Publ.
11. Kuz'minskii A.I. (2003) *Teoreticheskie osnovy posldiplomnogo pedagogicheskogo obrazovaniya v Ukraine. Doct. Dis.* [Theoretical Foundations of Postgraduate Pedagogical Education in Ukraine. Doct. Dis.]. Moscow.
12. Lanina I.Ya. (1985) *Formirovanie poznavatel'nykh interesov uchashchikhsya na urokakh fiziki* [Formation of cognitive interests of students in physics lessons]. Moscow: Prosveshchenie Publ.
13. Lisina L.A. (2000) *Razvitie poznavatel'noi aktivnosti starsheklassnikov v protsesse izucheniya predmetov fiziko-matematicheskogo tsikla. Doct. Dis.* [Development of cognitive activity of high school students in the process of studying subjects of the physical and mathematical cycle. Doct. Dis.]. Zaporozhye.

14. Neill A.S. (2009) *Theorie und Praxis der antiautoritaren Erziehung.* Hamburg.
15. Novikov A.M. (1999) Problemy gumanizatsii professional'nogo obrazovaniya [Problems of humanization of vocational education]. *Spetsialist* [Specialist], 8, pp. 2-6.
16. Petersen P. (2005) *Der kleine Jena-Plan*. Berlin.
17. Podlasyi I.P. (2004) *Prakticheskaya pedagogika* [Practical Pedagogy]. Moscow: Slovo Publ.
18. Rogers E.M. (1983) *Diffusion of innovations*. Free Press.
19. Rudenko M.P. (1999) Kriterii aktivnosti poznavatel'noi deyatel'nosti uchashchikhsya [Criteria for the activity of students' cognitive activity]. *Fizika i astronomiya v shkole* [Physics and Astronomy at School], M3, pp. 6-10.
20. Salomon J. (1984) What is Technology? The Issue of its origins and definitions. *History of technology*, 1, pp. 113-156.
21. Sergeev A.V. (1991) *Stanovlenie i razvitie istorii metodiki prepodavaniya fiziki v srednei shkole kak nauchnoi distsipliny. Doct. Dis.* [Formation and development of the history of the methodology of teaching physics in secondary school as a scientific discipline. Doct. Dis.]. Leningrad.
22. Shamova T.I. (1982) *Aktivizatsiya ucheniya shkol'nikov* [Activation of the teachings of schoolchildren]. Moscow: Pedagogika Publ.
23. Shchukina G.I. (1979) *Aktivizatsiya poznavatel'noi deyatel'nosti uchashchikhsya v uchebnom protsesse* [Activation of cognitive activity of students in the educational process]. Moscow: Obrazovanie Publ.
24. Simonenko V. (2014) Innovatsiini metodiki u pidgotovtsi suddiv [Innovative methods for preparing judges]. *Slovo nats. shk. suddiv Ukraïni* [Word of national judges' school of Ukraine], 1, pp. 108-111.
25. Sosnitskaya N.L. (2002) Aktivnyi podkhod k obucheniyu fizike v srednei obshcheobrazovatel'noi shkole [Active approach to teaching physics in a secondary school]. In: *Sovremennye tendentsii razvitiya estestvenno-matematicheskogo obrazovaniya* [Modern trends in the development of natural and mathematical education]. Kherson.
26. Svechnikov V. (1999) Zolotoe sechenie i chislo n v zadachakh fiziki [Golden section and the number n in problems of physics]. *Fizika* [Physics], 12 (24), p. 3.
27. Zvereva N.M. (1980) *Aktivizatsiya myshleniya uchashchikhsya na urokakh fiziki* [Activation of students' thinking in physics lessons]. Moscow: Prosveshchenie Publ.

Практическая направленность содержания повышения квалификации учителей физики

Дамирова Зарифа Валад кызы

Кандидат физико-математических наук,
доцент кафедры информатики и общетехнических наук,
Азербайджанский университет кооперации,
AZ1106, Азербайджанская Республика, Баку, ул. Нариманова, 93,
e-mail: zarifadamirova@hotmail.com

Аннотация

В статье раскрыты отдельные аспекты содержательного наполнения программ повышения квалификации учителей физики и астрономии в контексте внедрения нового «Порядка повышения квалификации педагогических и научно-педагогических работников». Закладка знаний, умений, навыков, формирование необходимых компетенций у выпускника школы осуществляется в ходе образовательного процесса коллективом учителей различных образовательных отраслей. Образовательный процесс по физике в этом контексте является ведущим, поскольку целью образования по направлению «Естествознание» является формирование компетентности по естественным наукам, технике и технологиям, экологической компетентности и развитие других ключевых компетентностей соискателей образования. Реализацией целей и задач естественной области в школе занимаются, в первую очередь, учителя физики. Поэтому их качественное последипломное педагогическое образование является залогом получения у выпускника школы знаний в соответствии с

актуальными на момент времени требованиями общества. Целью статьи является раскрытие отдельных аспектов содержательного наполнения программ повышения квалификации учителей физики и астрономии. В статье применялись методы анализа, сравнения и синтеза, а также для получения авторских выводов относительно эффективности таких курсов применялись эмпирические методы, в частности, наблюдение за работой преподавателей-методистов, которая была направленна на внедрение инновационных педагогических идей в процессе повышения квалификации учителей физики. Автором предложены решения для организации курсах повышения квалификации учителей физики и астрономии в соответствии с современными мировыми тенденциями в сфере образования.

Для цитирования в научных исследованиях

Дамирова З.В. Практическая направленность содержания повышения квалификации учителей физики // Педагогический журнал. 2022. Т. 12. № 2А. С. 91-102. DOI: 10.34670/AR.2022.88.92.044

Ключевые слова

Квалификация, повышение квалификации, профессиональное совершенствование, педагогическое образование, информационные технологии в образовании.

Библиография

1. Азимов Э.Г. Массовые открытые онлайн-курсы в системе современного образования // Дистанционное и виртуальное обучение. 2014. № 12 (90). С. 4-12.
2. Ахмерова Н.М. Личностно-деятельностный подход к контекстному обучению социального педагога // Педагогика. 2003. № 5. С. 55-60.
3. Данильчук В.И. Профессионально-педагогическая направленность преподавания физики в педвузе в условиях гуманитаризации образования // Педагогическое образование и наука. 2001. № 2. С. 41-46.
4. *Докучаева* В.В. *Теоретико-методологические основы проектирования инновационных педагогических систем*: *автореф. дис. … д-ра пед.* наук. Луганск, 2007. 44 с.
5. Доронина Н.Н. Организация учебного процесса в вузе с использованием активных методов обучения: методы обучения студентов в вузе // Социология образования. 2011. № 3. С. 31-38.
6. Зверева Н.М. Активизация мышления учащихся на уроках физики. М.: Просвещение, 1980. 113 с.
7. Иванова Л.А. Активизация познавательной деятельности учащихся при изучении физики. М., 1983. 160 с.
8. Исаев Д.А. Компьютерное моделирование учебных программ по физике для общеобразовательных учреждений на основе персонифицированных знаний: дис. ... д-ра пед. наук. М., 2003. 351 с.
9. Кузьминский А.И. Теоретические основы последипломного педагогического образования в Украине: автореф. дис ... д-ра пед. наук. М., 2003. 44 с.
10. Ланина И.Я. Формирование познавательных интересов учащихся на уроках физики. М.: Просвещение, 1985. 126 с.
11. Лисина Л.А. Развитие познавательной активности старшеклассников в процессе изучения предметов физико-математического цикла: дис. … канд. пед. наук. Запорожье, 2000. 208 с.
12. Новиков А.М. Проблемы гуманизации профессионального образования // Специалист. 1999. № 8. С. 2-6.
13. Подласый И.П. Практическая педагогика. М.: Слово, 2004. 616 с.
14. Руденко М.П. Критерии активности познавательной деятельности учащихся // Физика и астрономия в школе. 1999. М3. С. 6-10.
15. Свечников В. Золотое сечение и число n в задачах физики // Физика. 1999. № 12 (24). С. 3.
16. Сергеев А.В. Становление и развитие истории методики преподавания физики в средней школе как научной дисциплины: автореф. дис. … д-ра пед. наук. Л., 1991. 34 с.
17. *Сімоненко* В. *Інноваційні методики* у *підготовці суддів* // *Слово нац. шк. суддів України. 2014.* № 1. С. 108-111.
18. Сосницкая Н.Л. Активный подход к обучению физике в средней общеобразовательной школе // Современные тенденции развития естественно-математического образования. Херсон, 2002. С. 91-92.
19. Фатхутдінова О.В. Впровадження нових технологій в процесі підготовки спеціалістів правознавства // Гуманіт. вісн. Запоріз. держ. інж. акад. 2012. Вип. 48. С. 35-39.

20. *Харламов* И.*Ф*. *Педагогика*. М.: Гардарики, 1999. 520 с.
21. Шамова Т.И. Активизация учения школьников. М.: Педагогика, 1982. 208 с.
22. Щукина Г.И. Активизация познавательной деятельности учащихся в учебном процессе. М.: Образование, 1979. 160 с.
23. Botkin J.W. et al. No Limits to Learning. Oxford, 1979. P. 25-30.
24. Neill A.S. Theorie und Praxis der antiautoritaren Erziehung. Hamburg, 2009. 336 s.
25. Petersen P. Der kleine Jena-Plan. Berlin, 2005. 137 s.
26. Rogers E.M. Diffusion of innovations. Free Press, 1983. 453 p.
27. Salomon J. What is Technology? The Issue of its origins and definitions // History of technology. 1984. Vol. 1. P. 113-156.