Uzbek Scholar Journal
Volume- 24, January, 2024
www.uzbekscholar.com

THEORETICAL FOUNDATIONS FOR THE DEVELOPMENT OF STUDENTS ' COMPETENCIES IN PHYSICAL SCIENCE ON THE BASIS OF INFORMATION TECHNOLOGY

Yo. O. Akhmedov
Associate Professor of the Department of Physics and
Astronomy of the Navoi State Pedagogical Institute v.b., p.f.f.d. (PhD).

Abstract:
This article analyzes the theoretical foundations of the development of competencies of students in higher education institutions on the basis of Information Technology and reveals the didactic possibilities of effective use of it in the processes of physical education.

Keywords: physics, interactive education, information technology, physical phenomenon, virtual laboratory, physical models, software, didactic principles.

Introduction

One of the global trends of the current world development is the large-scale application of pedagogical innovations in the process of education and education, and today in developed countries special attention is paid to the technologization of the processes of teaching exact and Natural Sciences, modernization of the educational sphere, the creation of an interactive educational environment and the use of innovative methods. Virtual models of Information Technologies, physical phenomena are widely used in improving the knowledge, skills and abilities of students and students and their understanding of the laws of nature, cultivating creative thinking, obtaining accurate calculations of physically complex processes.

In order to improve the effectiveness of teaching physics in the world economy, there are many R & D activities aimed at the application of innovative and information and communication technologies, the development of creative abilities of students and students. These studies serve to satisfy the student-students ' need for knowledge in the educational system, including teaching physics, to modernize the educational environment on the basis of modern information technology, which positively affects the quality of Education.

The use of the capabilities of Information Technology at the level of demand in the development of scientific and professional competencies and creative activity of students in the teaching of physics in higher educational institutions of the Republic, the positive solution of the issue of scientific and methodological electronic educational software in the field of specialist directions will be the basis for improving the quality of Education. For Example, E.A.Traditional teaching methods of kinematics using computer technology in manina's work, O.E.And in Makarova's work, the method of using computer models in teaching, O.E.In Tigay's research work, the issues of the use of computer game trainers in the development of students ' cognitive activity in physics were studied.

According to the literature analysis, pedagogical conditions and psychological capabilities of teaching physics using information technology in higher educational institutions didactic requirements for classes in particular, technical requirements for electronic educational software can be described as follows: they are suitable for the given program of Science, provide active movement of students, correspond to the science of science, form, type and methods of training, , it is advisable to be easy and follow the principles of informative teaching.

The application of e-learning software in practice has its own characteristics, achievements and disadvantages, like other learning tools. These shortcomings can be eliminated on the basis of digitalization of the educational process, that is, ensuring the integration of the principles of exhibitionism and virtuality.

The positive effect of the use of electronic educational software in education for students can be attributed to the following algorithmically: the development of a student's personality, the preparation of a person for a comfortable life in an information society, the development of thinking (for example, visual-effective, visual-figurative, intuitive, creative, theoretical types of thinking), aesthetic education (for example, through the use of, by implementing computer simulation capabilities), etc.

Continuous use of e-learning software by students: activity-limiting algorithmization, technically dependent on computer technology, can lead to the development of oral speech at a sluggish (low) level, such as psychological-physiological delimitation, negative effects.

According to the literature analysis, e-learning software has confirmed that it can lead to an acceleration of the educational process and an increase in efficiency, effectively carry out personality-oriented education, provide the basis for the student's creative thinking. He also noted that the created e-learning software is important in the development of professional skills and abilities of students, as a means of helping to deepen their theoretical knowledge, in the formation of their professional skills, in the scientific-natural expression of processes and phenomena.

The use of didactic principles in the development of electronic educational software for teaching physics in higher educational institutions, its close connection with the subjects of the curriculum, consistent and scientifically based, students ' creativity is ensured, visual, has practical indicators, theoretical knowledge, practical skills and qualifications, it is scientifically and methodically indicated that the content of the tools is simply understandable. In the modernization of the traditional system, it is possible to distinguish groups of pedagogical technologies based on the humanization and democratization of pedagogical relations. These are technologies with procedural orientation, priority of personal relationships, individual approach, unflinching democratic governance and a bright humanistic orientation of content. These include pedagogical technologies based on the activation of students, pedagogical technologies based on the effectiveness of the organization and management of the educational process, pedagogical technologies based on methodological improvement and didactic reconstruction of educational material.

The role and implementation of the system of Information Technology and interactive education in the teaching of physics, the improvement of methods for organizing training in physics using information technology, methodological factors for the widespread use of Information Technology in the Independent Education of students are covered.

The formation of fundamental theoretical foundations of pedagogical management of the educational process is an important component of solving the scientific and practical problem of the scientific organization of educational practice. In teaching physics, invariant approaches to Information Technology and the interactive educational system, didactic principles of study Vosti are presented, and the organization and conduct of virtual laboratory classes in physics using electronic educational software, explaining topics using animations, technological repetition of teaching methods and chronometrical plans and technological map of training are important.

Based on the analysis of the basic and special professional competencies of the teacher (bachelor/master) in local education, an electronic educational and methodological provision for the

development of students ' creative thinking and as well as creative abilities was developed, as well as a list of special competencies on EDT in the organization of laboratory training related to the development of basic professional ICT competencies. These knowledge and skills characterize the level of competence of future specialists.

The training developments, developed on the basis of didactic principles, consist of a technological map of the training on topics, a chronometer plan, methodological instructions, an explanatory algorithm, theoretical questions on strengthening the topic, the end of the training, assessment of students, as well as assignments to the House.

The systematic use of information technology tools in training provides an opportunity for the formation of skills and abilities of students to perform virtual laboratory work, as well as the development of their own Practical Knowledge. In order to strengthen the theoretical knowledge gained in the lecture sessions, increase the effectiveness of education, the formation of demonstration experiments on subjects and practical skills for performing virtual laboratory work is an important factor in cultivating the creative (creative) abilities of students, allowing them to gain a level of knowledge, accelerate the educational process.

The role of informed Independent Education is important in improving the quality of the educational process. The Independent, sought-after knowledge of the student himself gives a relatively good result, rather than receiving ready-made information from the teacher. In the current period, it is necessary to carry out the tasks set before the educational system, independently assimilate educational materials of students, stimulate their professional growth, increase the responsibility of teachers in the upbringing of creative activity in them. Independent education is not for the teacher, but for the student and is the main factor in ensuring his future success.

Looking at electromagnetic oscillations using the example of an animated teaching method, giving students a task to the house, such as “drawing up one issue on the action in the model and writing down the solution in a notebook, drawing up (with answers) five test Questions on the conservation laws of energy in mechanics, will help them control the theoretical and practical knowledge they

In order to increase the effectiveness of teaching physics using information technology, it is recommended to qualitatively organize the educational process, in which it is advisable to use programmed educational materials, computer models, animations and virtual laboratory work appropriately and efficiently. When teaching physics using information technology, the student can independently work on the materials of the pedagogical software tool.

In the aspects explained above, the effective use of physics in teaching processes is important in the training of mature personnel.

References:

1. Axmedov Yo.O. Formation of information and didactic skills of future physics teachers. ISJ Theoretical & Applied Science, 2023. 11 (127), pp. 204-207.
2. Najmiddinov, M. K. Formation of students’ subject competencies in the field of physics with the help of virtual laboratory work. ISJ Theoretical & Applied Science, 2023, 11 (127), pp. 189-191.
3. Bekpo’latov U.R. The dissymmetry of religion, philosophy and sciences in the formation of a unified scientific worldview. ISJ Theoretical & Applied Science, 11 (127), 2023, pp.286-291.
4. Bekpo’latov U.R.. Materiyaning turli ontologik darajalarida simmetriya va uning buzilish qonunlari. Ilm sarchashmalari, 2023 yil, 37-43 b.

5. Bekpulatov U. Worldview aspects of symmetry and conservation laws in thermodynamics. ACADEMICIA An International Multidisciplinary Research Journal. India, Vol. 11, Issue 10, October 2021. pp. 1327-1335.
6. Bekpulatov U. R. Physical style of thinking - methodological basis for the formation of a scientific worldview. ISJ Theoretical & Applied Science, 2020. 09 (89), pp. 183-188.
7. А.А.Ахмедов, Э.А.Кудратов, Д.М.Холов. "Инновационные Технологии В Науке И Образовании" сборник статей победителей международной научно-практической конференции. 2016. Издательство: Наука и Просвещение. Пенза.
8. Б.Ф.Избосаров, А.А.Ахмедов, И.Р.Камалов. "Инновационные подходы к проведению лабораторных работ по физике". Новые технологии в образовании. 106-109.
9. E.N.Xudayberdiyev. "Bo'lajak fizika o'qituvchilarini tayyorlashda olamning fizik manzarasi bo'yicha tasavvurlarni shakllantirish". Academic research in educational sciences. 2021.
10. A.K.Kutbeddinov. "Generalization of uranium radio features in teaching natural sciencesak". Молодые ученые. 2023. 129-134.
11. I.R. Kamolov, G.I. Sayfullaeva -Formation of teacher's competence in the performance of laboratory and experimental works Journal of critical reviews. ISSN-2394-5125, 2020
12. D.I.Kamalova, S.N.Abdisalomova. "Zamonaviy innovatsion ta'lim". Journal of universal science research. Volume 1. Issue 1. 17 january, 2023. pp. 187-189.
13. Сарвиноз Тулкуновна Баракаева, Гулхаё Ихтиёровна Сайфуллаева, Сайибжан Садыкович Негматов, Нодира Сайибжановна Абед, Ихтиёр Рамазонович Камолов, Дилнавоз Ихтиёровна Камалова Методика получения композиционных образцов на основе термореактивных фурано-эпоксидных полимеров и органоминеральных наполнителей Universum: технические науки, 2021 1-1 (82) 42-45
14. L.K.Samandarov, E.N.Xudayberdiyev. Methodological problems of teaching the theory of particle-wave dualism for physics students. Theoretical&applied science. Теоретическая и прикладная наука. 256-262.
15. U.R.Bekpulatov. "Physical style of thinking-methodological basis for the formation of a scientific world view". Theoretical&Applied Science. 09(89). 183-188.
16. Ҳамроева Севара Насриддиновна, Камолов Ихтиёр Рамазонович. "Педагогика олий таълим муассасаларида бўлажак физика фани ўқитувчиларининг мантиқий фикрлаш қобилиятини stem таълим дастури асосида ривожлантириб ўқитишни такомиллаштириш". Science and innovation International scientific journal. volume 1. issue 6. UIF-2022. 2181-3337.
17. Каримова Ойниса Абдимуминовна. Активизация креативного мышления учащихся на уроке физики Традиции и новации в профессиональной подготовке и деятельности педагога. 227-229.
18. Azzamova Nilufar Buronovna, Nasriddinov Komiljon Rahmatovich. Electrodynamics As A Basis For Consolidating Knowledge Of Electromagnetism. Solid State Technology. 4(63). 5146.
19. У.Д.Шеркулов, А.М.Музафаров, Т.И.Солиев. Determination of mixing factors of daughter radionuclides in the uranium decay chain. Neuroquantology. September. 2022. Volume 20. Issue 11. London.
20. Sh.E.Khalilov, J.M.Khakkulov Z.Sh.Temirov. "Electrochemical Reduction Of Macroiones As A Surface-Active Nanocoating And Nanocomposites". The American Journal of Applied sciences. 2021.

21. Ж.М.Абдуллаев, Л.И.Очилов. “Изъятие пресной воды из подземных вод при помощи гелиоустановки водоносного опреснителя”. Молодой учёный научный журнал. 2015/5. 274-276.
22. F.Nabiyeva. Issiqlik hodisalarini o‘qitishga oid umumiy metodik tavsiyalar. «Science and innovation». 446-449.
23. Tursunboy Izzatillo ugli Soliyev, Amrullo Mustafoyevich Muzafarov, Bahriddin Faxriddinovich Izbosarov. Experimental determination of the radioactive equilibrium coefficient between radionuclides of the uranium decay chain. International Scientific Journal Theoretical&Applied Science. 801-804.
24. L.X.Turabova, D.I.Kamalova. Fizika fanini o’qitishda elektron o’quv qo’llanmalardan foydalanishning ahamiyati. “Polish science journal”. Warsaw, Poland. Issue 4(37). April. 2021. pp. 222-225.
25. С.С.Канатбаев, И.Р.Камалов, Д.И.Камолова, Г.И.Сайфуллаева. “Universum: технические науки”. Россия. Декабрь, 2016. №12(33). 38-40 стр.
26. Хушвақтов Бекмурод Нормуродович. “Innovative Fundamentals of Non-Traditional Teaching (on The Example of The Optics Department)” Journal of Ethics and Diversity in International Communication”. e-ISSN: 2792-4017. www.openaccessjournals.eu. Volume.1 Issue.3.
27. A.R. Sattorov G. I. Sayfullaeva, Methodology of Application of Innovative Educational Technologies from Astronomy to Laboratory Activities 2021/10/29 European Journal of Life Safety and Stability (2660-9630) 125-128
28. O’.K.Sunnatova, G.I.Sayfullayeva. Making a vacuum cleaner using the stem education system in students' laboratory classes. Web of Discoveries: Journal of Analysis and Inventions. 2023. 43-47.
29. Sayfullaeva Gulkhayo Ikhtiyor Kizi, Shodiev Khamza Ruziculovich, Xaitova Shakhnoza G’olibjon Kizi Conditions For The Formation Of Teaching Innovation Activities Journal of Pharmaceutical Negative Results, 2023 2420-2423
30. Э. А. Кудратов Э. А. Аллаберганова, Г. М., Кутбеддинов, А. К., Каримов, А. М., Интерактивные методы обучения студентов естественных специальностей на основании радиационных факторов экосистемы. Педагогика и современность ISSN: 2304-9065
31. B. I Xojiyev, N.A. Ulugberdiyeva, AA Xo’jayev, AA Amonov Studying the transition processes in physics lessons Galaxy International Interdisciplinary Research Journal 10 (5), 873-876, 2022
32. Bozorova Aziza Sayfullayeva Gulhayo Ixtiyor qizi Astronomiyadan stem dasturidan foydalanib quyosh soati mavzusini o’qitish - Yosh tadqiqotchi jurnali, 2022 35-38
33. Bobir Makhammadov The usage of android operating system mobile application terms in the russian language Proceedings of International Conference on Scientific Research in Natural and Social Sciences 2023/2/4 246-251
34. Khushvaktov Bekmurod Normurodovich Using fresnel bipprisms to explain the theme of light interference, science and innovation international scientific journal volume 2 issue 10 october 2023 46-48b, uif-2022: 8.2 | issn: 2181-3337 | scientists.uz.