GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 10, Issue 12, Dec. (2022)

INNOVATIVE AND INFORMATION TECHNOLOGIES FORMATION OF STUDENTS ' KNOWLEDGE, SKILLS AND ABILITIES

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ANATASION

Innovation and Information Technology in this article scientific research has been carried out to form the knowledge, skills and abilities of students and to increase the cognitive potential in the shakedown era.

Keywords; Innovation, Information Technology, Knowledge, Skills, Qualifications.

Socio-economic and socio-cultural changes taking place in modern Uzbekistan required modification of the educational process and significant changes in pedagogical theory and practice. The basic principles of education policy in Uzbekistan are described in the Law of the Republic of Uzbekistan "On Education", as well as the National Training Program. The concept is interrelated with the main directions of the socio-economic policy of the Government of the Republic of Uzbekistan and defines priorities and measures for implementing the general strategic line in the coming decade — training personnel, and first of all, young highly qualified teachers.

The national program for personnel training contains one of the points "Providing institutions of the personnel training system with highly qualified specialists, increasing their prestige and social status of pedagogical activity".

The current stage of modernization of education puts forwardhigher requirements for professional training of teachers, for mastering the latest teaching methods and technologies. This requires, on the one hand, new, more effective ways of organizing the educational process in a pedagogical university, in particular, revising the structure andcontent of methodological training of students. On the other hand, the very concept of "professional pedagogical activity of a teacher is currently undergoing certain changes.

The modern education system is characterized by fundamental changes in all its links, including in higher education. The most optimal means of improving the effectiveness of education is innovation (innovations) as a result of scientific research, advanced pedagogical experience of individual teachers and entire teams. The concept of "innovation" means innovation, novelty, change;innovation as a means and process involves the introduction of something new; as appliedto the pedagogical process, it is the introduction of new things in the goals, content, methods and forms of training and education, the organizationof joint activities of the student and students. Innovation process —the activity of creating pedagogical innovations, their use and dissemination in the practice of teaching. Innovative activity isthe developmentof innovations in educational institutions that can lead to changes in the state of functioning and design the development of the educational system, its subsystems and links.

Thus, an innovative approach to improvingeducation means introducing and using pedagogical innovations in the educational process of an educational institution. Based on the analysis of scientific and methodological studies of the problem of improving the methodological training of mathematics teachers in a pedagogical university, we have identified the following main and significantinnovative approaches to its improvement:

1) Integrative;
2) Activity-Based;
3) Differentiated;
4) A technological approach involving the use of a computer. Their characteristics are given below.

1. *Integrative approach in education*. The significance of the trend of integration of scientific knowledge in education is determined by the determining roleof integration processes of science in the formation of the modern style of scientific thinking and worldview of a person. The integration of sciences arises and gains strength under the influence of the processes of socialization, humanization, theorization,matematization, and formalization of scientific knowledge and research. The concept of integration refers to general scientific concepts; its first scientific definitionis:integration is "the unification into a whole, into the unity of any elements, the restorationof any unity". The history of integration in education in the 20th century is divided into three stages:

1) the beginning of the century-the 20s. - problem-based integrated training on an interdisciplinary basis (labor school);
2) 50-70 years. – intersubject connections.
3) 80-90 years. - integration itself.

Thus, the concept of "integration" is associated with such concepts as system, process, principle. Integration is possible if the leading component of integration (the system-forming factor) is selected, around whichthe integrative transformation takes place. Integration of related disciplines is necessary in higher education, as this not only contributes to understanding the unity of science, obtaining a whole with new properties, qualitiesand features, but also creates conditions for immersion in the essenceof educational information, allows teachers to use the entireset of didactic tools, and leaves time for additional, research, and creative classes.

The following concepts are associated with pedagogical integration: directions of integration, composition and structure of the integration process, forms and typesof integration, levels, principles and stages of integration.

According to UNESCO, the share of independent work of students from the total amount of academic time in universities in different countries ranges from 40% to 70%, since it is this work-that allows students to form and develop: organization, discipline,perseverance in achieving their goals, creative activity and initiative, the abilityto conduct a professional dialogue, etc., defend your developments in a reasoned manner. However, as pedagogical experience shows, independent work without simulators simulation real object is not able to provide a high level of assimilation [5]. The theory and practice of creating and applymodular didactic technologies and visual aids suggest that considering them only as a certain addition to a lecture or explanation is impractical. Analysis of theircapabilities has shown that they are gradually turning into tools for teaching and managing cognitive activity. This means that the process of forming knowledge

about specific facts, phenomena, objects and patterns passes, thanks to the specific capabilities of modern teaching tools, into the process of forming thinking,skills of independent communication, and highlighting the main thing .

A special role belongsto information technologies for the formation of such professionally important qualities (PVK) of an anti-crisis specialist as:

- ***thinking abilities:*** strategic thinking; dynamic anднon-standard thinking;
- ***organizational skills:*** optimal decision-making in a competitive environment; ability to work as part of a balanced creative team, ability to get along,communicate with people;
- ***commutative abilities:*** quickness of reaction in interaction with people; perceptualskills; conflict prevention and search for compromises;
- ***personal qualities:*** responsibility and initiative; motivation to achieve goals; belief in success; resilience in situations of risk and stress.

The initial stage of creating an information technology is a targeted analysis of the forms, methods and elements of knowledge transfer, skills and abilities. In general, for each course, discipline or training block, training consists of transferring knowledge, skills and abilities of working in this area to students or students. For each co discipline, therelationship between these components is different, but in general, all three occur. In00000the future, for the sake of brevity, we will talk about the acquisition of knowledge, bearing in mind that we are talking about all three components.

Among the sources of knowledge acquisition can be distinguished: teachers (teachers, teachers, professors, teaching masters, etc.); staff, study groups; family; colleagues at work, including commercial, not related to the university, joint research at the university; information sources: television, Internet, radio, literature; the surrounding society.

Computer support for obtaining knowledge can be carriedout in the forms presented in Table 1, where the componentsof knowledge, skills and abilities are listed, to determine the possibility of computer technology in intensifying the transfer of knowledge, skills and abilities.

Table 1. Forms and capabilities of computer support

Computer support			
Forms of computer support	Knowledge	Skills and abilities	
- electronic textbooks that include an intelligent navigator for the academic discipline with the ability to adapt to the individual characteristics of the student; - video films with recorded lectures; - telecommunications lectures with two-way communication, for example via the Internet; - interactive telecommunications consultations tutor-student; - interactive telecommunications consultations of the lecturer;	- the main provisions of the course, its place in special knowledge, methods of study; - problematic issues of course sections; - conclusions and methods for obtaining conclusions of the main provisions of the course, - analysis of the results of theoretical research and methods of analysis; - examples of solving problems using scientific provisions of the course; - analysis of practical problems of the specialty and application features, fundamental provisions;	- ability and skills to solve practical problems; - skills and practical problem solving; - ability and skills to design within the course, including in the team work mode; - research skills and skills; - ability and skills to work with computer models and systems; - ability and skills to analyze problems related to the specialty; - ability and skills of system solution of a practical problem;	- general culture; - information culture; - intelligence; - citizenship; - general erudition-professional - erudition; - passion; - individual experience of the teacher;

- electronic task books for the course with intelligent electronic - electronic project assignments, methodological and consulting support; - individual tasks with transmission, consultation, and remote support; - organization of work on a task or project of a team of students, their communication and organization of consultations in a remote form; - telecommunication organization of practical classes; - simulator modeling; - research modeling; - project tasks, methodological and consulting support; individual tasks with transmission, consultations and support in remote form;organization of work on the task, project of a team of students, their communication and organization of consultations in remote form;telecommunication organization of practical classes;simulator modeling; research modeling;databases, knowledge, documentation in electronic format in the form.	- examples, and analysis of normative materials related to the course; - connection of the fundamental provisions of the course with practical tasks; - knowledge, technology: problem solving, construction, use of models; - instrumental analysis, including software tools; - implementation of the system-logical principles of the course; - database and knowledge base related to disciplines/discipline, ability to find materials on the Internet; - system-logical, methods of the course development. principles of studying course tasks; - knowledge of basic design, research, and management tools; - knowledge of computer technologies, including communication technologies, and the ability to work with them.	- ability and skills of carrying out the initial stages of solving practical problems; - ability and skills of working with support tools; - ability and skills of organizing a specialist's workplace; - ability to develop educational and methodological documentation; - ability and skills of public protection	

KOOT, if properly organized, allows you to changethe learning process, dramatically reducing the amount of classroom time while simultaneously deepeningprofessional training. A significant part of the learning process can be implemented without personal contact between the teacher and the student. At the same time, the process of knowledge transfer will not only not suffer, but even benefit by restructuring each training block andstrengthening those components that require either personal contact or the use of computer technology.

Next, we will consider the aspect of applying information technologies for monitoringthe quality of knowledge on the example of the natural science cycle (ENC). The dominant trend of traditional education is to consider the subjects of the ENC cycle as providing the sum of knowledge, skills and abilities necessary for practical life, fororientation in the world of mathematical, physical, chemical and other objects, phenomena andprocesses. Most often, the knowledge of these laws, regularities, theories, etc. remainsalienated from the student, not passed through his personal individualperception. In addition, the natural sciences are developing so rapidly that, for example, the material that made up the content of chemical science several decades ago is now considered obsolete.Namely, such material is still the main

content of the school disciplines of the UEC. Therefore, natural science education lags significantly behind the development of science itself. Overcoming this crisis is possible with a change of goals: from mastering knowledge, skills and abilities in the form of scientific and theoretical content of science, to the goalof developing the student as a person, his abilities, and his creative potential.

The content of ENC subjects should focuson the search itself, the processof forming knowledge, the rules of formulas, etc.The first component of the learning content is the knowledge system, not the assimilation of information, facts of economic and scientific reality, not memorization of formulas. Here, first of all, "computer intervention" is required for cyclesof an integral nature, which can simultaneously introduce students to the subject world of a number of disciplines in mathematics, physics, chemistry, etc.

At the same time, existing teaching tools do not always allow students to enterthe microcosms of EMC subjects. Today, it is possible to give students the opportunity to "touch"the processes taking place in this world, changing their parameters and characteristics, only with the help of a computer.

The computer should also contribute to the formation of such concepts, laws andtheories in the course of ENC disciplines that do not find sufficient experimental justification in traditional training, for example, the study of the mechanisms of various reactions in chemistry or the environment with zero gravity in physics; the formation of such concepts of mathematics as-infinity, unlimited increase (decrease) of functions, unlimited approximation of it to any asymptote, parallelism of straight lines, etc.

At the same time, a semi-functional tool for forming concepts based on visual images is objectively necessary, and traditional teaching does not have adequate tools for this.

The second component of the learning content is the reproductive skills (both specific - subject and general educational) that the student must master during the learning process

The use of a computer is necessary, first of all, in situations related to calculations: this reduces the time spent by students on performing calculations, verifying them, and processing results; when developing typical skills.

The computer is a necessary and irreplaceable tool for the formation of a number of general educational skills, in particular general logical (systematization and classification,analysis and synthesis), reflexive (the ability to plan experimental data, collect, analyze and organize information).

The third component of the learning content is creative skills, whichthe learner obtains subjectively new knowledge by self-searching. A computer can serve as an effective tool for developing students ' creative skills. In particular, it opens up opportunities for solving a new type of problem, calledoptimization problems. Moreover, the computer allows you to find the optimal solution not only mathematically, but also graphically.

At the same time, the computer's capabilities are irreplaceable when stopping and solving problems to check the possible consequences of hypotheses put forward.

Special learning environments offer fundamental opportunities for the development of creative skills, in particular, constructiveand combinatorial ones. A significant contribution to the development of the creative component of the learner, as is known, is made by a properly organizedprocess of forming the modeling action.

The computer opens up great opportunities for this. A computer cansimulate a process or sequence of events. The computer's capabilitiesmake it possible to include "random events" in the simulated process, since the algorithm works on the basis of a mathematical model of the event. ENC subjects require special information that forms the background of their study. Databases have a number of advantages over reference literature: they are designed in the necessary way, and also contain a certain amountof information. The search results are displayed on the screen or printed out by the printer. As a result, we note the characteristic common features of ENC subjects that must be taken into account when using computers in teaching: the desire to integrate natural science knowledge; the representation of objects of study as systems; strengthening the connection between theories and life, combining the problems of science, technology, society and nature; humanization of the content of ENC subjects aimed at developing the student's personality.

Thus, we can conclude from all of the above that the useof personal computers in the study of ENC subjects is quite reasonable, since it can dramatically improve the quality of training, especially for integral cycles.

The article presents the developed and shown methodology for implementing the requirements for improving the methodological training of a future mathematics teacher in the course of studyingthis course based on innovative approaches to teaching — integrative, activity-based, differentiated, technological. Designed for:

- integrated learning objectives, including the formationof mathematical and methodological knowledge and skills, expressed in an activity form (in the actions of the trainee) and differentiated by levels of assimilation;
- integrated learning content, including mathematical and methodological material (elementary mathematics with theory and methods of teaching mathematics), presented in the form of differentiated educationaltasks of two types;
- an educational process that implements an integrated approach(integrated classes), uses various differentiated forms of activity, and provides differentiated monitoring andevaluation of learning outcomes.

The combination of the above approaches means the implementation of a technological approach to learning: learning goals are expressed in the student's actions, differentiated by levels of assimilation; the content of training includes educational tasks that are adequate to the goals set; the organization of the educationalprocess uses training sessions with a different combination of collective, group and individual forms of activity that underlie thecorresponding pedagogical technologies; control of the assimilation of knowledge and skills is carriedout in three types: input, current, final in the form of tests characteristic of pedagogical technology and multi-level control works.

LITERATURE

1. Karimov I. A. Harmoniously developed generation-the basis of progress in Uzbekistan: Speech of the President at the XI session of the OliyMajlis of the Republic of Uzbekistan on August 29, 1997. Tashkent:SharpePubl., 1998, 63 p. (in Russian)
2. Law "On Education" of the Republic of Uzbekistan//A harmoniously developed generation is the foundation of Uzbekistan's progress. Tashkent:SharpePubl., 1997, 63 p. (in Russian)

3. National training program//A harmoniously developed generation is the foundation of Uzbekistan's progress. Tashkent:SharpePubl., 1997, 63 p. (in Russian)
4. Bespalko V. P. Programmed training. Didakticheskieosnovy [Didactic foundations], Moscow, 1970 — 300 p. (in Russian).
5. Dembsky L. K. Obrazovanie, no. 1, 1999, pp. 84-90
6. Mashbits E. I. Psikhologo-pedagogicheskieproblemycomputerizatsiiobucheniya [Psychological and pedagogical problems of computerization of education], Moscow: Pedagogika Publ., 1988, 192 p. (in Russian).
7. P. Bespalko, V. P. Summands of pedagogical technology, Moscow: Pedagogika Publ., 1989, 190s.
8. Verbitsky A. A. Aktivnoeobuchenie v vyssheishkoly: kontekstnyjpodkhod [Active learning in higher education: a contextual approach]. Moscow: Vyssheishkola Publ., 1991, 208 p.
9. Gabay T. V. Pedagogicheskayapsikhologiya [Pedagogical psychology].un-ta, 1995. —160s.
10. Ivanov V. G. Projections of the content of professional-pedagogical training of the teacher of the higher technical school. Kazan: Karpol Publ., 1997, 258 p. (in Russian)
11. Kan-Kalik V. A. Osnovyprofessional'no-pedagogicheskogoobshcheniya [Fundamentals of professional and pedagogical communication]. - Grozny: Chechen-Ing. un-t, 1979. - 138s.
12. Soboleva, Elena V., et al. "Developing a personalised learning model based on interactive novels to improve the quality of mathematics education." Eurasia Journal of Mathematics, Science and Technology Education 18.2 (2022): em2078.
13. Жумақулов, Хуршид Кадыралиевич, and Мухсин Салимов. "О МЕТОДАХ ПРОВЕДЕНИЯ И СТРУКТУРЕ ПЕДАГОГИЧЕСКОГО ЭКСПЕРИМЕНТА." Главный редактор (2016): 80.
14. Esonov, M. M., and D. D. Aroev. "ON THE BASICS OF EDUCATION OF MATHEMATICAL THINKING IN THE MODERN COURSE OF GEOMETRY IN A COMPREHENSIVE SCHOOL." European Journal of Research and Reflection in Educational Sciences 9.3 (2021).
15. Ароев, Дилшод Давронович. "ИСПОЛЬЗОВАНИЕ ПОНЯТИЙ" АРИФМЕТИЧЕСКИЕ ДЕЙСТВИЯ НАД МНОГОЗНАЧНЫМИ ЧИСЛАМИ" В МАТЕМАТИЧЕСКИХ ИГРАХ." Актуальные научные исследования в современном мире 12-4 (2016): 16-18.
16. Ароев, Д. Д., and Г. М. Бабаева. "ABOUT THE IMPORTANCE OF INTERESTING EXERCISES IN MATHEMATICS LESSONS." Экономика и социум 2-1 (2021): 488-491.
17. АБДУНАЗАРОВА, ДИЛФУЗА ТУХТАСИНОВНА, МАНЗУРА СОБИРОВНА ПАЙЗИМАТОВА, and МИРСАИД МУХИДДИН УГЛИ СУЛАЙМОНОВ. "ПРОБЛЕМА ПОДГОТОВКИ БУДУЩИХ ПЕДАГОГОВ К ИННОВАЦИОННОЙ ПЕДАГОГИЧЕСКОЙ ДЕЯТЕЛЬНОСТ." Молодежь и XXI век-2015. 2015.
18. Расулова, Г. А., З. С. Аҳмедова, and М. Норматов. "МЕТОДИКА ИЗУЧЕНИЯ МАТЕМАТИЧЕСКИХ ТЕРМИНОВ НА АНГЛИЙСКОМ ЯЗЫКЕ В ПРОЦЕССЕ ОБУЧЕНИЯ." Ученый XXI века (2016): 65.
19. Расулова, Г. А., З. С. Аҳмедова, and М. Норматов. "EDUCATION ISSUES LEARN ENGLISH LANGUAGE IN TERMS OF PROCESSES." Учёный XXI века 6-2 (19) (2016): 62-65.
20. Расулова, Г. А. "МУЛЬТИМЕДИЙНЫЙ ЭЛЕКТРОННЫЙ УЧЕБНИК-СОВРЕМЕННОЕ СРЕДСТВО ОБУЧЕНИЯ." Педагогические науки 4 (2011): 65-66.