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THE CONCEPT OF DEVELOPMENT OF INFORMATION TECHNOLOGY EDUCATION IN THE SYSTEM OF CONTINUOUS EDUCATION IN THE REPUBLIC OF UZBEKISTAN

Abstract: This article is devoted to the concept of development of informatics education in the system of continuous education of the Republic of Uzbekistan, which discusses the role of informatics in the continuous education stages, and the stages of continuing education of computer science departments to meet the requirements of the state educational standard.

Key words: concept, informatics education, continuing education, standart.

Language: English

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Introduction

The modern stage of development of society is considered on the basis of digitalizing of all spheres. This process is characterized by the complete transition from the industrialized society to the industrialized information society, along with the problems and solutions deriving from digitalizing. Its main characteristics are: change of the importance of information, its being considered as a key factor in its development; formation of the developed information products and services market; increasing demand for information products and quality of production; increasing rates of information growth and open access to free information for all strata of the population; expanding the boundaries of the use of computerized information technology in all areas of human activity, changing the way of life in the field of education, production, culture, recreation and other areas.

Large-scale reforms are being implemented in our country in recent years. The Decree of the President of the Republic of Uzbekistan dated

February 7, 2017 No. PD-4947 "On the strategy of action for the further development of the Republic of Uzbekistan" can be mentioned as a fundament. The Decree sets out the Action Plan for the five priority areas of development of the Republic of Uzbekistan in 2017-2021, as outlined in paragraph 4.4 of the Education and Science Development: radical improvement of the quality of general secondary education, foreign languages, in-depth study of computer science and other important and demanding subjects such as mathematics, physics, chemistry, and biology; promotion of research and innovation, creation of effective mechanisms for the implementation of scientific and innovation achievements, establishment of specialized research laboratories, high-tech centers and technology parks at universities and research institutes. To achieve these objectives, a number of legislative acts have been adopted that will further clarify the work that is to be done in the country. In particular, with the aim of further improving the implementation of information and communication technologies in

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various fields, the Presidential Decree dated November 21, 2018 "On Measures to Improve the System of Monitoring and Implementation of Information Technologies and Communications" Decree of the President of the Republic of Uzbekistan dated February 19, 2018 PD-5349 "On measures for further improvement of information technologies and communications" dated February 19, 2018 The decision of the Ministry of Development of Information Technologies and Communications of the Republic of Uzbekistan № PD-3549 will lead to increase of computerization, computer literacy, development of software industry, increase of quality and efficiency of education in all spheres. On the other hand, education is defined by the role of modern science education in the training of specialists in accordance with modern requirements. 5110700-methodology of teaching information technology The educational direction is one of these directions, and the effectiveness of training specialists in this area is closely related to the teaching of modern subjects and constant updating of their content. It requires constant study of international experience, regular implementing of its achievements and innovations taking into account the conditions of our country.

In the development of society, the science of Informatics is increasingly manifesting itself as a special field of knowledge at the level of methodological and metaphorical levels. At the same time, it is integrating the system of natural and mathematical and social sciences and humanities.

The main part

1. Introduction and continuity of education in the system of continuous education:

1.1 Preschool Education

a) Analysis of the reflection of educational content in the preschool system.

5110700 - Informatics teaching methodology relates to the content of the subjects in the curriculum.

The primary computer literacy education in preschools is incorporated into the daily activities and activities of children.

- Preschool provides a healthy, full-fledged development of a child, which stimulates the desire for learning and prepares him for regular education.

- Formation of training programs;

- Creating children's educational cartoons and fairy-tales, puppet theatres.

- Professional development of teachers.

b) *Reflection of the content of education reflected in the system of pre-school education in the context of undergraduate education.*

In the context of disciplines specified in the curriculum of higher education in the system of pre-school education, in the following competences in the field of computer technologies in education should be acquired:

-modern information technologies, computer networks, information systems and their usage in various fields, theoretical competences of information protection, e-commerce;

-syntactic, semantic and pragmatic measures of information, hardware and software of information processes, operating systems, visual programming technologies, computer networks and their types, network resources, information systems, their essence, use tasks and functions of electronic document management system, automated information systems, modern multimedia systems, organizational and legal bases of information security, practical competences of using electronic information systems, technical and software protection of information;

1.2. Elementary education.

a) *Analysis of reflection of educational content in the system of primary education:*

Requirements to the A1 level (1-4 grades) of the state educational standard of general secondary education in the system of elementary education are related to 5110700 - the methodology of teaching computer science relates to the content of the disciplines specified in the curriculum.

In the 2-3th grades this type of education covers primary education and provides students with regular knowledge of computer science and computer technology, the need to master them, basic academic, scientific and cultural knowledge and computer management through the formation of ethical and moral values, creative thinking and conscious attitude to the environment, and choice of profession based on national and universal values.

b) *Reflection of the content of the educational process reflected in the system of elementary education in the context of undergraduate education:*

The subject "Information Technologies in Education" on the concept of computer science education is taught in the field of Elementary education and sports education of Higher Education and students should be aware of following competences:

-the competence of modern information technologies, computer networks, information systems and their application in various fields, information security and theoretical protection of e-commerce;

-syntactic, semantic and pragmatic information measurements, hardware and software of information processes, operating systems, visual programming technologies, application technologies, computer networks and their types, network resources, information systems, their application and functions, electronic document management, automated information systems, Modern multimedia systems, organizational and legal framework for information security, practical competencies for using;

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1.3. General Secondary Education:

a) *Analysis of reflection of educational content in the system of general secondary education;*

In the 5-11th grades students were given a number of experience in computer science projects taking into account their age, as well as other creative activities for the intensive use of the internet resources for the social and cultural development of the modern science-based world of information science, create simple, complex-based programs for graduate students according to the SES.

Requirements for B+ and B1 levels of the general secondary education system are related to the content of subjects specified in the curriculum of 5110700-the methodology of teaching computer science. Elements of basic and general competences of students are formed step by step.

Information. Informatics as a subject. The notion of information. The role of information in our life. Information around us. Different types of information. Actions on information (the 5th grade). Information and information processes. The security of information (the 6th grade). Features of information. Information processes and tools.

The ways of describing information (5th class). Numeral systems. Describing information in binary numeral system. Completing arithmetical functions in binary numeral system (7th class)

Computers.

Rules of security techniques and requirements of hygiene (6th class). Computer as a means of working with information (5th class). The main devices of a computer and their functions. Mutual connection among computer gadgets. Using key board and the screen of a computer. Arithmetical and logical basis of computers. Development history of calculating technics. Generation of electronic calculating machines and their description. Personal computer, its architecture. Main (processor, device of memory, its types, keyboard, mouse, screen) and additional (disc player, printer, plotter, scanner, joystick, sound blaster, modem, video projector) devices of a computer. Working with computer's memory. Saving information in the memory of a computer (working on files and catalogues) (7th class).

Computers software. Software: systematic, practical and hardware programs. Interface of the user, special programs. Describing graphical information on computer. Computer graphics (pixel, matrix, screen and image and palette graphic file format), using SMART technologies (7th class).

Information technologies. Graphic editor. Creating and editing pictures. Text editor. (symbol, word, line, paragraph, text, document). Recycling text information (6th form). Designing of presentations and preparing presentations. Multimedia. Elements of web-technology (the language of HTML). Elements of electronic table (line, column, cell). Describing and recycling information in electronic tables (8th class).

Technologies of resolving problems on a computer. Stages of solving problems on a computer. Object, definition of the object, the value of a definition. Model and modeling, types of models (abstract, physic, biologic). Mathematical modeling. Algorithm, performer of an algorithm, ways of describing algorithm, types of algorithm (linear, networked, repeatative), assistant algorithm. Basics of programming (the language of programming, its opportunities and programming) (9th class).

The prospects of modern IT proliferation. Information networks. Means of communication and fields of a computer. Local, regional and global lines. Technologies of customer-server. Services of the net: www, electronic address, creating mobile applications, electronic government, government services, robotechnics, programming of guided objects, web-design (CSS), archives of information, graphics (10-11th classes).

b) Illustrating of the content of education field described in the system of secondary education in the form of bachelor's degree.

Professionals are trained in the field of teaching methodology of informatics (5110700) as a means of direction described in secondary education of Higher education system. Subjects fixed in the study plan of the department are illustrated in the following points.

Algorithms:

The notion of algorithm and its basic actions, algorithm performers, the ways of describing algorithms, resourcing and iteration, the notion of complexity of algorithms, types of algorithms, basic ways of producing effective algorithms, algorithmic languages.

Programming languages:

Languages of programming and their classification, high leveled programming languages, projecting that is directed to an object, projecting objects, mathematical objects; projecting based on object's hierarchy, programming language directed to a certain object and basics of programming.

Informatics.

Information, its types and forms, ways of describing information, ongoing and discrete information, informative processes, saving data, sending, receiving and editing information, features of information, measurements of information, universal means of editing data on computer, modeling as a main method of scientific knowledge, modeling information and conception of formatting, role of information in the development of society, development of society and educational problems, informational education.

Network technologies: computer communications; network services; network technology; protocol of data transfer; local computer network, global computer networks, history of foundation and development of Internet network, Internet as a means of technology and information

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source, internet services, e-mail technology, information searching technology, foundation of Internet and Intranet unity, HTML as a means of information resource foundation.

Computer software:

The physical basis of semiconductor microelectronics, notions on integrated schemes, principles of structure of microelectronic gadgets and means, basics of structuring and working of fast and permanent devices, microprocessors, microprocessors as an microelectronic basic of modern computers, special features of working and activating microprocessors, computer technology and its history of development, classification of electronic machines, architecture and working principles of computers, main devices of computers and their classification, channel and tire systematic, microprocessor and computer memory, disconnect system, registers and models of memory communication, working regimes of microprocessor, principles of managing computer devices, entering system of data, software language for machines, modern tendencies of developing computer architecture, modern computer software and its types, computer sources, operative systems, network operative systems, modern operative systems, practical software, systems of working with texts, graphs and audio files, managing systems of modern software, table processors, integrated software, user's practical software, practical instrumental packs used to solve problems in particular sciences.

Data systems:

Notion of systems and its various definitions, relations between system and sphere, elements included in the system, objects of the system, relation and anti-relation, types and forms of structures, cycles of the system, main notions characterizing action and development of the system: position, balance, stability, development, description of the system, rules of development and action of the systems, structural analysis, methods and models of structural analysis, structural approach in science and technology, data systems, structure and types of data systems, data systems and computers, describing and organizing information in data systems, principles of searching and selecting information, information models of data, stages of creating information models, types of information models, conceptual models of the subject. Definition of technology, information technologies and their types, development stages of information technologies, information technology software.

Database:

Information models of data, problems of information structure and its description, models of network relational hierarchy, information base and projecting it, relations between elements of information base and organizing it, management system of information base, main objects of

management system of information base and organizing them, object-directed programming in information base system, entering SQL, SQL server and using it, "customer - server" technology and its usage, creating users' program on information base system, information about notion base, artificial intellect, main trends in artificial intellect research area, notions system, models of describing notions, main characteristics of experts system, types of expert systems and solutions for problem in this field, software classification of expert systems, expert systems with intellectual information, information about logical programming, description of subject rules and facts of information base, information recursion and structure in programs, information about functional programming.

Computer graphs:

Information about computer graphs, types of computer graphs: vector, raster, fractal, CD graphs. Technologies of working with graph information. Special means of graph information. Means of software to edit graph information: Paint, CD-max, Corel Drawe, Photo Shop, 3DSMAX and others. Image processing

Web design:

Design in internet, functions, approaches, solutions. HTTP, FTP, working in protocols. Web site programs and programming language: Adobe Dreamweaver, Word Press, HTML, PHP, Java, CSS, XML. Creating websites and mobile appendixes using ready samples. Architecture of data location in websites:

Achieving accurate reflection and constant updating of data. Displaying graphical information. Animation and banners display and requirements. Optimize their size when displaying data. Creating dynamic sites. Web servers. Site testing and evaluation.

Robototechnics

Robotics and its modern equipment in the modern world, the introduction of robotics to modern schools, the basic classification of industrial robots, the classification of mechanisms, the physical construction of models, microbotypes and their features.

Mathematical and Computer Modeling:

Model concepts and types, modeling in science and technology, physical and mathematical models, formalization, the basic principles and features of modeling, practical problems and computer solution stages, mathematical and information modeling, concepts and stages of computer modeling, computational experiment, accuracy and reliability of experimental results, analysis and interpretation of the model, methods of solving mathematical models, numerical methods, structural methods of algebraic and transcendental equations, interpolation and approximation of functions, methods of processing of observations, mathematical programming, problems of programming and solving methods, computer

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modeling software, Working out of computer models, computer models and their use in educational process.

Pedagogical software:

Pedagogical software tools and their types, methods of organization of interaction of pedagogical and software tools, principles of creation of pedagogical and software tools, technology for creating scenario of pedagogical and software tools, management of educational activities in pedagogical and software resources, technology of creation of pedagogical and software tools in programming languages, technologies, principles of electronic learning materials, voting technology, demonstration, control, educational programs, didactic capabilities of virtual software, expert-educational systems, psycho-physiological features of students and computer capabilities, management of educational activities in pedagogical software, technical tools for the creation of pedagogical software, e-lessons, e-learning aids, e-books, e-chrestatics, electronic catalogs, e-learning materials, working with pedagogical software, working with automated educational systems.

Methods of teaching computer science

Introduction to the course teaching methods, didactic principles of teaching, teaching methodology, teaching software, forms and methods of teaching, methods of control and evaluation, modern tools, training Methods of organizing and conducting teaching, extracurricular activities, teaching documentation, planning of educational process, analysis of lessons in pedagogical activity; methods of teaching computer science as a science; didactic principles in teaching computer science; content of computer science and information technology disciplines in continuous system; content of computer science and information technology in secondary special education; Educational-methodological support of teaching of computer science and information technologies in system of continuous education; Methodical system of teaching computer science and information technology courses; e-learning and software; The use of pedagogical software in teaching computer science and information technology; goals and objectives of teaching computer science and information technology; forms of teaching computer science and information technology; methods of teaching computer science and information technology; methods of control and evaluation in computer science and information technology; modern teaching technologies in teaching computer science and information technology; the use of modern means of teaching computer science and information technology; planning of educational process in computer science and information technology; Methods of organizing and conducting training sessions in computer science and information technology; Methods of organization of extracurricular activities in computer science and

information technology; room of modern informatics and information technologies; organization of educational work in the informatics room; organization of educational process in computer science and information technology in the informatics room; Olympics in computer science and information technology; integration in the teaching of computer science and information technology;

Information science teaching technologies and projecting them:

Pedagogical function. Requirements for pedagogical function of information science teacher. Innovations, their classification, efficiency criterion in education. Innovative pedagogical activity. Innovative pedagogical process of an information science teacher in continuous education. Means of forming innovative activities of information science teacher. Traditional and nontraditional teaching technologies in information science education. Objects of information science and innovations aimed to supply them. Its continuity in education system. Pedagogical technologies to improve learning-knowing process of learners in information science teaching. Person-directed teaching technologies in information science education. Developing critical-thinking skills in information science education. Actuality of projecting teaching process. Projecting teaching process of an information science teacher. Projecting technology. Projecting education. Means of forming innovative pedagogical environment. Scientific and methodological basics of innovative pedagogical process projecting. Projecting the subject matter of information science. Projecting lessons and trainings. Evaluating skills and projecting innovative methods of assessment. Projecting collaborate module teaching. Projecting problematic teaching career guided information science. Projecting pedagogical technologies aimed to improve knowing process of learners in information science education. Projecting teaching information science with modern means of education. Projecting extra-curricular activities on information science.

1.4. Secondary special vocational education:

- Analysis of reflection of the content of study in the secondary special, vocational education system;
- Reflection of the content of education gained from the secondary special vocational education system in the Bachelor's degree.

In secondary special vocational education system learners are taught computer literacy in two ways. The first is through the information science course (computer is the object of study), the second is through using computer while studying other subjects (computer is means of education). Undoubtedly, computer encourages learners to study more.

1.5. Bachelor's degree

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Advanced training requirement, syllabus, science program and normative-methodological documents (according to State Attestation, Graduation qualification work, course work, independent study, Science Olympiads, etc.) are created in the following forms:

- Intramural form of education – skills requirement, syllabus, science programs and normative-methodological documents are suited with secondary education standards, PISA, TIMSS international assessment programs;
- Extramural form of education;
- Correspondence form of education;
- Special correspondence form of education;
- Second higher education skills requirement, syllabus, science programs and normative-methodological documents are suited with secondary education standards, PISA, TIMSS international assessment programs.

Functions of information communication technologies in training pedagogues in different education departments include

- giving knowledge about its importance in social and economic development and training methods that investigate its influence on various fields of human activity;
- introducing techniques and programs of collecting information, saving, changing and recycling, as well as teaching how to use them practically;
- maintaining computer skills to solve practical problems, to use opportunities of technical tools while concluding the results of information processes, to explain their criteria;
- maintaining ability of working with information from various sources (textbook, scientific literature, ICT, annotated dictionaries and references, electron layouts, internet pages, etc.) on the subject, obtaining new skills and knowledge independently while solving practical problems;

- teaching to analyze and evaluate information, convert one type of information into another;
- teaching to be confident that through the help of information communication technologies information point can be learnt, proper usage of science and technologies for further development of humanity, to be respectful for creators of technologies and science, considering information science to be viewed as an element of universal culture;
- using skills and knowledge obtained to supply safety in everyday life and different spheres of life;
- introducing information communication system and technologies to continuously improve and update career skills and knowledge;
- using software means to develop career competency of pedagogues to improve higher education quality according to modern standards;
- supplying the usage of modern information communication technologies by pedagogues;
- using practical software means in teaching special sciences.

1.6. Master's degree

Master's degree course subject plans, syllable and normative-methodological documents interrelated with bachelor's education is created.

1.7. Further higher education:

To create complex programs of examinations of base doctorate and qualifications

To create theoretical methodological course plans for the first year of base doctorate

To work out complex passport of specialty

1.8. Retraining and refreshing:

a) Complex syllable, science program and normative-methodological documents are created in the system in the retraining system.

b) Complex syllable, science program and normative-methodological documents are created in the system in the refreshing system.

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