

COMPUTER USAGE IN HIGHER EDUCATION: PSYCHOLOGICAL ASPECTS

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The paper analyzes the problems of introducing the computer technologies into the educational process. The opportunities and weaknesses of the implementation of computer programs and ways of overcoming them are discussed. During the Covid pandemic, the usage of computer and on-line recourses in educational process has increased. Computer models have numerous opportunities and allow speeding up or slowing down the time, narrowing or expanding the distance, in the real world holding the imitations of dangerous or impossible actions, which make them indispensable tools for the educational process. The results of the survey of the computer usage, their forms and features in the educational process are provided. In this article we also tried to identify the actions which, in students' opinion, could increase the role and importance of computer-mediated education.

Keywords: *computerized education, educational computer programs, problematic and research education, computer-equipped classrooms.*

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The theoretical bases. The problem of informatization and the one of computerization directly related to it, is the one of the central problem of the contemporary world which is mainly related to the increasing role of information.

In parallel the development and improvement of technology made the computers available to all the segments of the society. So the investment of computer technology in the educational area is an important stage for the development of transformational society. The necessity to organize educational process on-line and increase of computer use in this process force us to pay more and more attention to this problem.

Now the science focuses its attention on the development of basic principles, structural and organizational models of the computerized education, and because so far there has been no common approach to this problem, the computerization

of the actual educational process cannot occur, or it is fragmentary and uncoordinated [2,3].

In our millennium the education has turned into the most important and valuable strategic resource of human capital, thus conditioning the development of society, and the informatization is the main accelerator of education. This problem is closely linked to the computerization of the educational system, priority of which is conditioned by the fact that the problem is still little explored, as well as the government of Republic of Armenia has proclaimed the information technology development and investment as one of the first priorities for our society [1,2].

The technological progress brought to a minimum the technical resources of the educational process, combined all of this apparatus in single instrument - the computer. With great success and effectiveness computer took over the functions, which previously had carried the TV, video and audio players, computing machine, etc., thereby significantly increasing the acceptance, storage and transmission quality of information.

Now the computerized education is carried out by one of the four main ways or by their combination.

- Explanatory-demonstrative,
- Reproductive,
- Problematic,
- Research.

Taking into account that the first method does not presuppose the existence of the feedback between the educational system and students, the nature of application of the computer in this case is partial and fragmentary.

Reproductive method of education with the use of computer equipment, suggest the adoption of information which is given by a teacher or computer and organization of its reproduction. The application of this method allows increasing the level of productivity of educational process significantly, but does not offer an opportunity to radically change the traditional teaching (without a computer application) scheme. In this aspect the problematic and research methods are most effective [5].

The application of problematic method uses the computer possibilities to organize the educational process as a process of problem formulation and search of solution directions. The main purpose is the activation of the students' cognitive interests. In this case the essential role has been given to information collection, classification, analysis, transmission, as well as development of the deduction skills of information.

The using of the research method ensures the students' own creative work in specific scientific and technical research in the process of education.

Indispensable part of this method remains the modeling - the dynamic imitation or representation of a real object, situation or environment, which, in essence, is most conveniently and efficiently organized with the help of special computer programs.

Now, we have developed and effectively used any modeling programs for researches and teaching of some branches of natural and engineering sciences, which, we should note, unfortunately, are not applied in humanitarian and socio-economic blocks of professions.

Computer models, in contrast to other models have a number of opportunities at the expense of flexibility and versatility. The computer models allow us to speed up or slow down the time, narrow or expand the distance, hold the imitation of expensive, dangerous or impossible in the real world actions and to see their virtual results equivalent to real the time and environment [7].

The effective usage of computer technologies in education is based on the following general principles and their respective conclusions [2].

General principles	Conclusions
Students' active participation in the educational process.	Encouraging students' activity
Constant personal analysis by student	Avoiding the standard schemes of analysis, changing the problems in various stages of education
The feedback in the educational process	Informing the students about the results of their actions in each specific situation.
Availability of fast feedback	Providing on possible fast feedback
Rejection of negative results behavior	Not enhancing the unwanted actions
Continuous repetition of learned material.	Applying and repeating the styles of actions, even if they are shown
Individualization of quantitative indicators	Choice of means of strengthening the individual
Accounting individual differences of students' perception in the extreme conditions	Flexible and ambiguous application of the above principles.

Compared to other technical means of education flexibility, variance of the application of different algorithms, as well as the individual influence on student actions are the advantages of computer.

Computerization of education is viewed in terms of positive and negative factors.

The negative factors are:

Lack of facilities at working with computer. Now this defect is eliminated through the investment of portative PC, the liquid-crystal table monitors or tablets, but due to their high price they do not have wide distribution, The screens invariable size (the impression from the larges images is more vivid, than from standard 15-17-inch monitor images).

One of the negative effect on human-computer "relations" is the factor of technicism: the fact that an individual has to deal with the machine not with another individual,

Increasing volumes and decreasing prices of computer products, lead to a light-minded attitude towards them (in this case the value of information for user is identified with cost of machine, where the value of programs is lost).

In parallel with these negative factors, we can mention the following opportunities:

The concept of documentary, the accuracy of represented objects, availability of the sources, which lead to the learner's personal participation, Opportunity of parallel internet data access and through this the ability to make available your own achievements to the public,

The possibility of information classification, grouping and making any other manipulation [4, 6].

Of course the above-mentioned problems have different effects on different individuals depending on their personal and physiological characteristics. Accounting of these qualities will also be complicated by the fact that many aspects of man-computer system have not received a scientific explanation.

Student's computer work puts forward numerous methodological and psychological problems. Not all students easily appropriate computer skills, which leads to unwanted stress. The Russian poll shows that 30% of students with computers have high blood pressure and sleep worse.

It's facilitated by the uncomfortable conditions in the computer-equipped classrooms (not just lighting, noise, etc.). The same polls show that study of any science through computer is connected with the performance of difficult tasks, interests the 35 - 40% of the students. Approximately 35% of the students finds the teaching through computer "useful" and "necessary", 7-12% of students finds the work with the computer "heavy" and "unproductive."

The reality of the practical application of the computer system in higher education in the Republic of Armenia is far from the theoretical ideas that are discussed above. Some attempts are being made to use the computer as a tool for presentation of didactic material, and computer programs for problematic and research education are not only developed but are not even adapted and used as well.

Empirical survey: To study the situation and discuss more details refer to the results of the pilot survey among undergraduate students, 50 students have participated in the survey. Questionnaire developed by us to study the application of different computer programs in the educational process was applied.

The first question was aimed at studying the students' subjective value (importance) of the use of computer in education. The main results are presented in Table 1.

Table 1.

Subjective importance of the use of computer in education

Cross tabulation Profession * Subjective importance						
% in Profession		Importance to use of computer				Total
		Very important	Not very important	Possible without	Not at all important	
Profession	Humanitar.	30,0%	50,0%	10,0%	10,0%	100,0%
	Natural	90,0%	10,0%			100,0%
Total		60,0%	30,0%	5,0%	5,0%	100,0%

As shown in table 60% of students found the use of computer very important and only 5% not at all important, but the results are different in different group: if for 90% of students in natural sciences the use of computer is very important, then for half of the students in humanitarian sciences the use of computer in education process is not very important. This difference is statistically significant (χ^2 Pearson, $p=.05$). We can assure that for students in natural sciences the use of computer in a statistically significant degree is more important, then for students in humanitarian sciences.

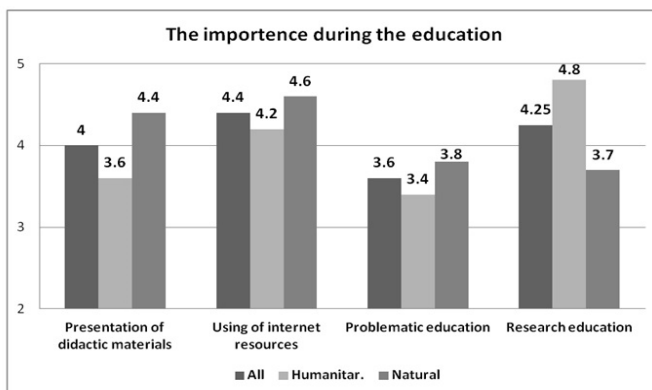


Fig. 1. Evaluation of the importance of the use of computer in different fields of education

Then we tried to find out the value of subjective importance in different fields of study. As shown in figure 1 the use of computer is considered most important in the field of “Using of internet resources” by students.

In the second place is the using in research education. But if in the field of internet resources both group have demonstrated the same results, then in the field of research education the results differ (for humanitarians – 4.8, for naturals – 3.7). Despite this statistically significant differences aren’t ascertained. After studying the expectation, we tried to explore how in reality the students evaluate the use of computers in education. The results showed in figure 2.

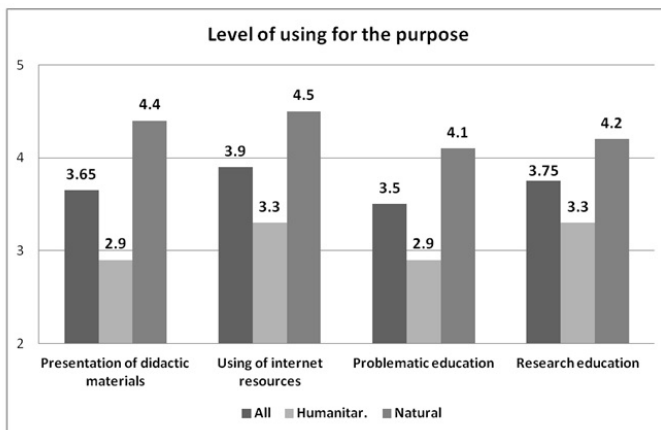


Fig. 2 - Evaluation of the level of using computer programs in education process

In all the fields the level of using is less, than expectations. According to them the use of computer in field of Internet resources is more often.

It means that in the field of using of internet resources the expectation and reality correspond in terms of the primacy. The same is in the field of “Research education”. The most interesting is the statistical significant difference between 2 groups in the field of “Presentation of didactic materials” (Levene’s test $p=.153$, t-test $p=.011$). This means that in the process of education of students in natural sciences the didactic materials are presented, statistically significant, more ($M=4.4$), than in the process of education of students in humanitarian sciences ($M=2.9$). In others fields the results aren’t statistically significant.

Another question was aimed at studying the students’ knowledge of professional educational software. The main results are presented in Table 2. The most interesting is that only 10% of humanitarian students know any educational computer programs. And all of the students in natural sciences know one or more educational software. This difference is statistically significant (χ^2 Pearson, $p=.000$).

Table 2.

Knowledge of professional educational software

Crosstabulation Profession * Knowledge of professional educational software				
% in Profession		<i>Knowledge of professional educational software</i>		Total
		Yes	No	
Profession	Humanitar.	10,0%	90,0%	100,0%
	Natural	100,0%		100,0%
Total		55,0%	45,0%	100,0%

With regard to the factors disturbing the full implementation of computers in the educational process, students mentioned the lack of resources, low educational level and the indifference of students.

We also tried to identify the actions which, in students' opinion, could increase the role and importance of computer-mediated education. Among these factors are:

- Retraining of teachers,
- Creation of software database,
- Creation of Armenian-language programs,
- Increase of the computer literacy in schools.

Conclusions: Computer models have numerous opportunities and allow speeding up or slowing down the time, narrowing or expanding the distance, in the real world holding the imitations of dangerous or impossible actions, which make them indispensable tools for the educational process.

More than half of the students found the use of computer very important, but if for 90% of students in natural sciences the use of computers is very important, than for students in humanitarian sciences it is less important.

The field of "Using of internet resources" of the use of computer in educational process is considered most important both in student's expectation and in real evaluation.

Teacher's retraining, software databases and the creation of Armenian-language programs, the increasing of computer literacy in schools are identified as actions which could increase the role and importance of computer-mediated education.

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ИСПОЛЬЗОВАНИЕ КОМПЬЮТЕРА В ВЫСШЕМ ОБРАЗОВАНИИ: ПСИХОЛОГИЧЕСКИЕ АСПЕКТЫ

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В статье проанализированы проблемы внедрения компьютерных технологий в образовательный процесс. Обсуждаются возможности и слабые стороны использования компьютерных программ, и способы их преодоления. Во время пандемии Covid 19 возросло использование компьютеров и онлайн-ресурсов в учебном процессе. Представляются результаты опроса об использовании компьютеров, его формах и особенностях в учебном процессе. Компьютерные модели обладают многочисленными возможностями и позволяют ускорять или замедлять время, сужать или расширять дистанцию, в реальном мире проводить имитации опасных или невозможных действий, что делает их незаменимыми инструментами учебного процесса. Приведены результаты обследования использования компьютеров, их форм и особенностей в учебном процессе. В этой статье мы также попытались выявить действия, которые, по мнению студентов, могли бы повысить роль и значение компьютерно-опосредованного обучения.

Ключевые слова: компьютеризованное образование, образовательные компьютерные программы, проблемное и исследовательское образование, компьютерно-оборудованные аудитории.

ՀԱՄԱԿԱՐԳՉԻ ՕԳՏԱԳՈՐԾՈՒՄԸ ԲԱՐՁՐԱԿԱՆ ԿՐԹՈՒԹՅՈՒՆՈՒՄ. ՀՈԳԵԲԱՆԱԿԱՆ ԱՍՊԵԿՏՆԵՐԸ

Հայրապետյան Դ. Ռ. , Վարոյան Հ. Ա. (Երևանի պետական համալսարան, Երևան, Հայաստան)

Հոդվածում վերլուծված են ուսումնական գործընթացում համակարգչային տեխնոլոգիաների կիրառման հիմնախնդիրները: Քննարկվում են համակարգչային ծրագրերի օգտագործման հնարավորությունները, հնարավոր մարտահրավերները և դրանց հաղթահարման ուղիները: Covid 19 համաճարակով պայմանավորված առցանց ուսուցման տարածումն անխուսափելիորեն ուղեկցվեց համակարգչային տեխնոլոգիաների կիրառման ավելացմամբ, որն էլ ավելի կարևորեց տվյալ հիմնախնդիրը: Համակարգչային մոդելներն ունեն բազմաթիվ հնարավորություններ, որոնք թույլ են տալիս արագացնել կամ դանդաղեցնել ժամանակը, մոտեցնել կամ ընդլայնել հեռավորությունները, իրականացնել իրական աշխարհում վտանգավոր կամ անհնարին գործողությունների իմիտացիա, ինչը նրանց դարձնում է ուսումնական գործընթացի անփոխարինելի գործիքներ: Ներկայացված են ուսումնական գործընթացում համակարգիչների օգտագործման, դրանց ձևերի և առանձնահատկությունների հարցման արդյունքները: Այս հոդվածում մենք նաև փորձեցել ենք բացահայտել այն գործողությունները, որոնք ուսանողների կարծիքով կարող են բարձրացնել համակարգչով միջնորդավորված ուսուցման դերն ու արժեքը:

Հանգուցային բառեր՝ համակարգչայինացված կրթություն, համակարգչային կրթական ծրագրեր, խնդրային և հեղափոխական կրթություն, համակարգչային հազեցած լսարաններ: