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INFORMATION-COMMUNICATION TECHNOLOGIES AS THE INSTRUMENT FOR IMPROVING THE QUALITY OF THE EDUCATIONAL PROCESS

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Нині різні інноваційні технології використовуються для поліпшення освітнього процесу шляхом подання відповідного сучасного навчального контенту, контролю якості та оцінки результатів навчання на різних етапах, а також створення нових організаційних форм навчання, освітніх та наукових ресурсів та електронних систем, а також їх впровадження в процесі самостійної роботи студентів і аудиторних занять. Важливим напрямком сучасних досліджень є трансформація освітнього середовища навчальних закладів за допомогою спеціальних платформ. Оскільки електронні освітні ресурси підтримують різні види навчальної та дослідницької діяльності, такі як вивчення теоретичного матеріалу, пошук корисної інформації, розв'язання задач, тестування, навчання, симуляція, проведення експериментів і т.п. Крім того, національною стратегію розвитку освіти визначено курс на підвищення конкурентоспроможності та якості освіти для забезпечення державних фахівців високого рівня в сучасних соціально-економічних умовах, а також інтеграцію в європейський і світовий освітній простір і саме з цієї причини одним з основних стратегічних напрямків національної системи освіти сьогодні є інтеграція інформаційних технологій та інноваційних освітніх програм. Стаття присвячена аналізу проблем модернізації освітнього середовища в контексті підвищення та контроля якості інформаційно-комунікаційних технологій та впровадження інноваційних засобів у навчальний процес. На основі аналізу наукових досліджень в цій області і відповідно до визначення якості навчального процесу за критеріями ЮНЕСКО було порушено питання про системи моніторингу функціонування вищого навчального закладу як одиниці, що є його економічним, адміністративним і освітнім керівництвом. Здійснено аналіз факторів, які зараз необхідно враховувати в нашій освітній системі. Висвітлено найбільш важливі індикатори інформаційного освітнього середовища. Виокремлено основні чинники рівня сформованості освітньо-наукового середовища. Окреслено перспективи використання електронних ресурсів у системі вищої освіти

Ключові слова: *освітнє середовище, інноваційні інструменти, якість навчального процесу, електронні ресурси, компетенції*

1. Introduction

Such processes as globalization and acceleration of social development world processes, society transformation to the informative stage of its development, democratization of social relations, integration of social systems etc. are changing the world where we live in.

Nowadays, the development of technique and leading technologies in social life is being changed faster than even one generation people lifespan. At the same time, these objective processes have created new social problems in the sphere of science, education, health, economic, moral and ethical etc.

Implementing advanced technologies appearance, fast-moving development of their instruments and means, also wide introduction digital and fiber optic technologies into all spheres of social life has accelerated the integration and communication processes, provided new more productive possibilities of electronic information processing. The emergence of innovative technologies moves us forward on the way to an informative society and future knowledge society. This explains the need for an analysis of trends and future prospects for the development of research of the problems of modernization the educational environment in the context of the quality of information and communication technologies.

2. Literature review

"Consequently, objectivity of the modern world development predetermines such contradiction – the society, from one side, produces and will in future produce new requirements to the high-quality indexes of different educational levels of their members. From the other side, for the members of society there will be new and new necessities in relation to the educational base of the personality development and accordance to the requirements of society. The decision of this contradiction is in the society members' education level promotion which predetermines the necessity of adequate development of the education system – increasing of availability of education, expansion of spectrum and improvement of quality of educational services which it gives" [1].

The National strategy of education development in Ukraine until 2021 defined the course to improve the competitiveness and quality of education to ensure public high-level professionals in the current socio-economic conditions, as well as integration into the European and world educational space. In addition, one of the strategic directions of the national education system is the widespread integration of information technologies and innovative educational programs [2].

The progress of implementing so-called cloud technologies has a significant impact on the formation of the educational environment of the university, bringing with it new models of the organization, based on decisions on innovative technologies, which are ensuring the best pedagogical outcomes to increase the learning results. In this regard, the phenomenon electronic learning environment has come to the forefront, as it has many

progressive features including mobility, as well as full-scale interactivity, free access to the network, unified infrastructure among others [3, 4]. Modeling and analysis of the information technology infrastructure of the university, and determining the possible types and forms of learning activity have been investigated in [5].

According to the recent research [6, 7], the problems of implementing cloud technologies in educational institutions so as to provide software access, support collaborative learning, implement scientific and educational activities, support research and project development, exchange experience and provide more flexible, powerful and high-quality educational services and resources are especially challenging. The topics of software virtualization and the forming of a unified information infrastructure on the basis of cloud computing technology have become increasingly popular lines of research [8]. The formation of such learning environment is recognized as a priority by the international educational community [9], and is now being intensively developed in different areas of education, including mathematics and engineering [10, 11].

There is a tendency towards the increasing use of the software (for example, among Mathematicians are the most popular packages such as Octave, Mathematica, MATHLAB, Maple, WolframAlpha, R, Maxima, Calculation Laboratory, Sage MathCloud, Google Apps, IBM-VSphere, Microsoft — WCloud, Azure, Amazon, Mech, WApps, SkyDriven and others)

3. Purpose and tasks of the research

The aim is analysis of the problems of modernization of the educational environment in the context of improving and quality control of information and communication technologies into the educational process.

To accomplish the aim, the following tasks have been set:

1. To analyze external impacts factors on our educational system

2. To consider indicators and factors of the formation level of the educational-research environment

3. To reveal the perspectives of using the electronic resources in the system of higher education

4. Powerful informational-digital influences on the educational space

The web, social software and cloud computing will definitely have an impact on an enterprise, but an impact on our educational system will be also astounding. I think that these trends are moving much faster than our current educational system can handle. Here are on three fundamentally new impacts that must be factored into our educational system: low-cost and free technology, growing content, collaboration. Some moments of it are reflected in [12]. Let us consider each aspect more detail.

As you know, a huge growth in low-cost and free technology takes place now. It is because many technologies that were previously expensive or unavailable are now becoming free to anyone with a web browser (this is true for web sites, blogs, social interaction, video sharing, music sharing, content creation, collaboration software, editing/presentation and publishing, computing in the "cloud", etc.). Our students are already using many of these technologies in their personal lives. For example, as you know cloud-based learning technologies are already used so the challenge is to transfer this experience into the wider sense context. We should take advantage of this trend in our professional world, i.e. leverage technologies that are cost-effective, and strive for the broadest feasible and equitable access to technology for students and staff. It's obvious that they will both enrich our student's technology-enabled education, and importantly, reduce a budget impact.

The amount of content is growing at an exponential rate, available to a broad audience, and anyone can contribute. As you understand, a content can be enriching or unsafe and debasing as information has come from limited "known" channels (textbooks, encyclopedias, scientific research...) and, unfortunately, most content now comes from relatively "unknown" and "dubious" sources through the web. As a result, true, partially true, or false information of all forms is available to us instantaneously. That is why the ability to use rapidly changing and evolving technologies to safely filter, evaluate and ethically find a content in order to achieve our personal or professional goals and also to create, communicate, collaborate, express one's self, and influence others is a critical 21st century skill.

Students and staff of different institutes and universities leverage technologies to collaborate with others efficiently, synergistically, safely and ethically. It is becoming easier to find, connect and collaborate with anyone in many expanding ways: mobile phones, email, instant messaging, social and collaborative software, blogs... Now it is not necessary at all to form teams and work face-to-face. New technologies make interactive collaboration possible on the web, between students in the same class/university/city/country or around the world. Dynamic teaming and very interactive collaboration are main skills of our century.

Combining the last two aspects, it is important that content can be constantly evolving, improving through collaboration and interaction and updating. Now people do not just refer to information or copy it, they interact with it, modify it, they add to it and this is to be encouraged.

5. Research results and their discussion

The most important indicators of the development of the information educational environment are quality, accessibility of e-learning, adaptability, integration, full-scale interactivity. The last three components were discussed above. Let us dwell on the quality and accessibility more detail now.

The system of monitoring the quality of the learning process cannot be the same for all educational institutions due to the variety of curricula, teaching methods and techniques; however some of its fundamental principles should have a common base [13, 14]. Any system of quality control is a complex of regulatory documents which specify the techniques, ways and methods of the work of all the participants of the process: teachers and students on condition of further enhancement and increase of the educational process quality as well as professional competence of all educators at the system of

higher education. Certainly, it is necessary to make conditions for standardization and control of quality of electronic resources which may lead to emergence of the better examples of learning resources and to more widespread use of them. This system of monitoring the quality of the learning process should meet the needs not only of students and teachers, but first of all should take into account the demand from future employers and the labour market. The problem of developing a good-quality system of educational process monitoring is of paramount importance for Ukraine nowadays. Such a system that can not only monitor the educational activity of an individual educational institution but also determine the direction of its progressing as a whole and also help faculty members, find optimal ways of developing the educational process, substantiate and develop new syllabuses, areas of research, methods and techniques, control and correct the level of knowledge, acquired by students in a timely manner, as well as develop students' both personality and professional competences.

Let us consider the aspect of accessibility of e-learning more detail. Among the main factors providing access to e-learning [15], there are:

– economic

(as e-learning needs funds for production, supply, evaluation of electronic products, the use of auxiliary materials such as e-journals, databases, etc.);

– availability of material and technical base

(computer equipment, related software);

– technical and technological factor

(availability of broadband access, sufficient communication speed, availability of additional special devices);

– qualification aspect

(e-materials access, distance learning courses, a certain level of information and communication competence of students and teachers);

– quality of educational resources

(that is, the quality of educational content, software resources and educational resources);

– quality of search engines and portals.

Generalizing all the above mentioned, we can say that there are real advantages of using electronic resources:

– the formation of databases, data collections, etc., available to various educational institutions;

– assuring wide and cost-effective access to educational resources as within university and also in the educational environment of the region, national and/or even international scale;

– training, retraining and professional development through providing access to electronic resources of a single educational environment;

– formation of such an information platform in the system of higher education, which provides access to the best samples of electronic resources and services.

So, the low-cost and free technology, content, collaboration are new impacts that must be factored into our educational system. So, these factors create the new educational terms for modern 'staff capital' of Ukraine forming and will be instrumental in purposeful and sure advancement of Ukrainian education to the developed countries of Europe and world. Among the indicators of the development of the innovative educational environment of the higher educational institution there were highlighted and considered such as quality, accessibility of e-learning, adaptability, integration, full-scale interactivity. In addition, real advantages, trends and future prospects for the development of the educational environment in the context of information and communication technologies of using electronic resources were given.

Among the main problems of implementation electronic resources (e-distance education, cloud-based learning technologies and using of others new advanced technologies) into the educational training, retraining and professional development there are the following: computer-technological, organizational, administrative, psychological, pedagogical, financial-economic and regulatory. It is obviously, that decision of such problems, mentioned above, and challenging tasks requires an integrated approach and is not one moment or short lasting action, realization of which depends on, for example, existence of financial resources (as in the situation with the computer-technological problem which can be solved easily and fast).

But the author hopes that similarly to this work the study of positive experience, carrying out the researches and, of course, introduction of the scientific results into practice will assist the development of the national system of education and, undoubtedly, the new investigations, proposals, ideas, wishes of different researches will be a mortgage of the above listed complex tasks and effective stage-by-stage realization and allow to develop and improve Ukrainian education quality from day to day.

6. Conclusions

Thus to achieve the goal from the third point of this article the following have been set:

1. An analysis of impacts that must be factored now into our educational system is made.

2. The most important and main factors of the level of formation of the educational-research environment has been given.

3. The perspectives of using the electronic resources in the system of higher education are revealed.

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