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Information technologies in training ukrainian medical professionals

To integrate into the global space of medical education means first of all, to acquire creatively those skills that students of the best medical universities acquire, using modern scientific and didactic means of teaching process. Mechanism for solving this task includes examining the content of foreign education and professional curricula and the introduction of new modern courses in domestic system, critical evaluation of the content of each discipline and use of progressive ideas. The essential elements also are 1) the translated and used in the educational process the best textbooks of foreign medical schools, 2) the invitation of leading foreign professors to analyze the curricula, to assist in the preparation of teaching methodical supply, to organize research and teaching seminars with chairs' teachers, to lecture and conduct practical classes etc. [Kobzar 1997].

That convergence of ideology and content of medical education with the world one, creative use of new teaching methods is crucial in the recognition of Ukrainian medical Diplomas in the world.

Progress of medical science directly affects the system of higher medical education, changes the requirements for knowledge, skills, competences and their creative development. The development of medical science requires not only changes in the content of educational subjects, but also indicates the implementation of new advanced methods of training and scientific research into the training process. We consider using information technologies (IT) in medical education to be one of such innovations.

Many domestic scientists, such as N. Balovsyak, O. Yelnikova, S. Sysoeva and others, paid much attention to the implementation of the interactive information technologies into education process of Ukrainian higher educational institutions. I. Bulakh, L. Kovalchuk, V. Martsenyuk, O. Mintser, Yu. Voronenko et al. discussed in particular lots of aspects of medical education informatization. Among foreign researches of IT in medical education we can't but mention Thierry Karsenti and Bernard Charlin from University of Montreal, Canada, G.A. Mooney, J.G. Bligh from Liverpool medical school, UK, G.O. Barnett from Massachusetts General Hospital, Harvard Medical School, USA, J. Dorup from University of Aarhus, Denmark etc.

Analyzing the modern status of Ukrainian education, O. Yelnikova writes that information resources are used only episodically, not at large scale. It's explained by undevelopment of proper technologies and unpreparedness of many teachers and tutors to use IT and computer techniques. Using information technology in education can be attributed to innovation processes. So it becomes clear that insufficient development of technologies may lead to loss of key ideas of innovation and creativity, and incomplete use of teaching staff [Yelnikova 2005].

As it is defined by S. Sysoeva and N. Balovsyak, information technology is a set of interrelated components that allow receiving, storing and processing information using computers; they allow obtaining personality's systemic view of the Universe [Sysoeva, Balovsyak 2006].

According to L. Kovalchuk and V. Martsenyuk, „implementation of information and communication technologies in the training process is a requirement of nowadays. This dictates the need for a unified educational information environment at higher medical schools. The problem of reliable storage and accessible presentation of large amounts of educational information has long been one of the most actual problems at higher medical educational establishments of Ukraine. In the structure of the educational process of each medical university there are several sites where lots of educational information is to be stored and processed. The tasks of storage and operation presentation of all structured information appear in case of:

- maintenance of educational documentation which is stored at all departments and at the methodics one;
- the elaboration of curriculum schedule and timetable;
- at the University Library, which contains information both in paper and electronic formats” [Kovalchuk, Martsenyuk 2008].

In the United Kingdom, for example, information technology has the potential to revolutionise the way medicine is learned by students and healthcare professionals. This potential was recognised by the General Medical Council in their report *Tomorrow's Doctors* in which the need for future generations of doctors to be familiar with the application and scope of information technology is described [*Tomorrow's Doctors* 2003].

This paper focuses on the following: use of computers as aids to learning medicine, implementation of two key applications of information technology to medical education: multimedia and the internet; it also describes current status of distance medical education (DME) in Ukraine.

A rising tide of IT is sweeping through medical education worldwide, providing learners with easier and more effective access to a wider variety and greater quantity of information. Following the trend of all new technologies, it is the younger generations who are more able to adapt and react to new technology.

As IT plays an interestingly larger role in primary and secondary education we can expect that with each new intake of medical students, their knowledge

and expectations of IT will grow. It is this increasing demand for IT in medical curricula that has the greatest potential to influence how medicine is taught and learned. The two most widespread developments in IT are multimedia and the internet. They complement one another with the internet providing a means for instantly delivering multimedia information to an international audience.

Multimedia computers can display information using a wide variety of formats such as sound, digital video, animation, pictures and text. In medicine it may be primarily used in computer-based learning (CBL) programmes primarily for undergraduate medical students. In UK, for instance, it became an integral part of undergraduate and even postgraduate medical curricula. British medical schools use many CBL programs for medicine that use multimedia to present and provide access to different types of information. For example, digital video clips of surgical procedures, animated anatomical structures and aural commentaries to accompany text [Mooney, Bligh 1997].

There may be different types of medical multimedia designed to address different learning needs. CBL programs classified as information resources are the most simple in terms of educational design and are primarily used as aids to finding information quickly. Learner can explore and investigate information to build links and relationships and form ideas and hypotheses. These activities are key to adult learning and they play a major part in new medical curricula, in particular problem-based courses. Moreover, multimedia has the potential to provide learners with educational experiences that traditional text-based methods cannot (eg, interactive patient consultations).

G.A. Mooney and J.G. Bligh write that multimedia programs are often described as interactive and this is especially the case with educational programs. From an IT perspective „interactive” is used to describe communication between a user and a computer. For many medical multimedia CBL programs this communication consists of „button clicking” (eg, to show a picture or play a video clip) or „electronic page turning” (eg, to go to another part of the program). This is the lowest level of interactivity where the computer is performing tasks (eg, showing a picture) requested by the user. This level of interactivity could be described as „reactivity” and it is therefore somewhat misleading to describe CBL programs of this nature as „interactive”. Truly interactive CBL programs aim to establish an educational conversation between a user and a computer. This can be achieved using features such as feedback on strengths and weaknesses and progress charts linked to learning activities and self-assessment [Mooney, Bligh 1997].

Another important tool of IT is internet – a global network of computers that allow information to be viewed or transferred from one computer to another. It offers facilities such as electronic mail, information transfer and the ability to search for information.

Internet provides many opportunities for independent work of medical students and professionals. Search work of students as a part of the learning process by credit-modular system has a greater importance. Thus, students search for up-to-date information on the internet not only for homework and assignments for independent work. Internet provides them with quite favourable conditions for searching for information that is needed for writing course and graduation projects. The internet is primarily used in medical education to provide users with access to lecture notes, references, course materials and personal information. For example, a lecturer could make his/her lecture slides accessible on the internet. Tutorials addressing specific subject areas may also be delivered on the internet and provide learners access to core texts and reference materials and self-assessment questions (usually multiple choice). Internet-based tutorials, lecture notes etc., can be accessed from anywhere in the world connected to the internet (eg, a tutorial in Liverpool can be accessed by students in Harvard or Kyiv). This offers great potential for distance learning courses, both national and international. Because the course materials are stored in one place revisions can be made instantly available to all students.

Taking into account the fact that Ukrainian medical schools due to the financial crisis can't supply all learners annually with the freshest information concerning this or those methods of diagnosing, treatment etc. in textbooks, students use different web pages which provide them with everything happening not only in Ukraine but in the whole world. The most frequently web pages used by most medical learners and professionals worldwide are the following: American Medical Association; British Medical Journal; Postgraduate Medical Journal; Virtual Hospital; Visible Human Project; *Medical Encyclopaedia* and lots of others.

So, we can see that multimedia and the internet present great opportunities to support and enhance medical education. They provide learners with access to large quantities of information which can be searched and viewed in a variety of ways (eg, digital video, sound). The internet, in particular, can help learners from different countries to participate in, for example, tutorials and communicate with other learners and tutors.

IT also plays an important role in the project method, especially within the implementation of credit-modular system in Ukraine. This method has long been used in Western Europe, while in Ukraine it is still an innovation. For example, a Polish researcher B. Narel notes that the work of students is the most productive if students work in groups. Each group first receives the task that must be fulfilled within some time. After a series of briefing on the tasks of the project and its presentation students share the roles in groups and work on the project. Experience has shown that implementation of this method in the learning process, students approach to the tasks of the project is very creative [Narel 2007].

Using information technology consists not only in finding information in the global network, but also in the processing of statistical data on epidemics, pandemics and other issues of medicine and health service. In this case, using programs Microsoft Office Excel and Microsoft Office Access is of great importance. During the presentation of the project, students may use video with multimedia projector and interactive whiteboard, show presentations created by means of Microsoft Office PowerPoint etc.

In Ukraine at the Ministry of Public Health there is the Centre of Distance Learning headed by Professor O. Mintser. One of the leaders in elaboration of the Distance medical learning (DML) technologies is National medical academy of Post-diploma education. Thus, at the end of 2004 the specialists of medical informatics department of the above mentioned academy first not only in Ukraine but in Europe as well together with American scientists organized international distance on-line seminar concerning tuberculosis problems. The participants of the seminar were highly qualified specialists from Ukraine, USA, Poland and Slovakia. That was revolutionary event – first experience of DL in Ukraine. In November–December 2005 the specialists that academy conducted the distance on-line course of postgraduate advanced thematic training and distance consulting of patients using videoconference regime. Since 2007 at the Academy the information and telecommunication technologies have been used for training family doctors; there are organized distance lectures, video conferences, patients' consultations and scientific research thesis defence [Voronenko, Mintser 2006].

In 1999 there was established the Test Centre of Ukraine, which provides external evaluation of quality of medical staff. This is the first in Ukraine a professional testing organization that deals with external assessment and testing. Test Centre together with educational institutions that train specialists for the health sector, owing to scientific and methodological support, information support and information exchange provide the estimation of the quality of training of medical personnel according to the Order of Ministry of Health of Ukraine.

An important step in reforming postgraduate medical education was the modernization of the internship, the expansion of the list of medical specialties according to the standards of the EU and implementation of continuing professional development of a physician who should be aware with all the modern medical technologies.

Taking into account current trends of continuing professional development, the main provisions of the European integration process, the development of modern information technologies and the principles of distance education, the application of distance methods of medical training is especially important during the further qualification course.

Considering territorial features of our country, a large number of very remote regions, which are often supplied by only 1–2 professionals, as well as the

difficult economic situation, this type of education makes it possible to embrace much more doctors and nurses. In addition, practitioners familiar with the system of distance education, are ready to better use telemedical capabilities of the region, which constitutes a solid foundation for the effective implementation of telemedicine in the practical health care in Ukraine.

Unfortunately, there are many problems connected with introduction of IT and DML in Ukraine. There is no medical informatics in a list of scientific specialties of Higher Attestation Commission. Only enthusiasts such as National Medical Academy of Post-diploma education, National O. Bogomolets Medical University, Zaporizhzhya State Medical University and National Technical University „KPI” today organize courses of lectures on DL.

So, we can see that the role of information technology in educational models is growing by integration of information technology on international level, development of international network, Internet, Telemedicine etc. The development of new educational information technology is evident, proving that information in transfer of medical knowledge, medical informatics and communication systems represent the base of medical practice, medical education and research in medical sciences. In relation to the traditional approaches in concept, contents and techniques of medical education, new models of education in training of health professionals, using new information technology, offer a number of benefits, such as: decentralization and access to relevant data sources, collecting and updating of data, multidisciplinary approach in solving problems and effective decision-making, and affirmation of team work within medical and non-medical disciplines. Without regard to the dynamics of change and progressive reform orientation within health sector, the development of modern medical education is inevitable for all systems in which information technology and available data basis, as a base of effective and scientifically based medical education of health care providers, give guarantees for efficient health care and improvement of health of population.

Literature

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Abstract

The article depicts the analysis of the needs and opportunities connected with educating the students aimed at commencing employment at the Ukrainian health care service in the scope of using information technologies, allowing for increasing their professional competences. The use of modern information technologies may potentially support didactic processes by means of analysing the newest achievements of world medicine available e.g. on the Internet, electronic libraries etc.

Key words: professional education, professional competences, information technology, didactics of nursing.

Technologie informacyjne w kształceniu pracowników służby zdrowia na Ukrainie**Streszczenie**

Artykuł zawiera analizę potrzeb i możliwości związanych z kształceniem studentów mających podjąć pracę w ukraińskiej służbie zdrowia w zakresie wykorzystywania technologii informacyjnych, służących do podnoszenia ich kompetencji zawodowych. Korzystanie z nowoczesnych technologii informacyjnych potencjalnie może wspomagać procesy dydaktyczne poprzez analizę najnowszych osiągnięć światowej medycyny dostępnych np. w Internecie, elektronicznych bibliotekach itp.

Słowa kluczowe: edukacja zawodowa, kompetencje zawodowe, technologia informacyjna, dydaktyka pielęgniarstwa.