THE UNIAR APPROACH TO COMPUTER SCIENCE AND INFORMATION TECHNOLOGIES TEACHING FOR HEALTH PROFESSIONALS

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The analysis of the situation of post-graduate and additional education in the field of computer science and information technology of professionals in the health care system under the condition of the uniform state information system creating has been introduced. The author issues the reasons for the radically changing of the approach to education, participating in the field of both health care management and in the field of proved of the health care. Developed by the author uniar approach for computer science teacher to organize the educational process, within the framework of classical training to get the information on current situation and needs in medicine, and using this information as feedback to integrate the experience, knowledge and skills of the teacher and students to create the optimal, efficient and qualitative information technology education.

Keywords: uniar approach, Computer Science, Information Technology, Health Informatics, additional and post-graduate education of physicians

The order of the Health Ministry of Russia from 28.04.2011 № 364 approved the concept of the creating a unify state information systems in health care [1]. One of the major factors contributing to the successful development of the program is to increase the current level of health care workers at all levels concerning information technology. Therefore, one of the most urgent tasks of Public Health is the organization of computer science and information technology teaching in the postgraduate and additional education of health professionals system.

Beginning from 2000s, increasing the growth rate of health information, are both quantitative and qualitative changes in the application of information technology by physicians and patients.

The number of hours is provided for the teaching of computer science in the cycle of postgraduate and additional education of physicians is low, but at that time the most important aspects, from the introduction of high-tech digital equipment to transition to paperless document management technology must be considered. The problems of the informational security must be obligatory considered, because the most of the information in medicine can be classified as confidential and must be secured in accordance with the law.

The information in this article is based on the experience of the author as a teacher of the Ural State Medical Academy of the additional education.

Let's present the situation. There are 20–30 health professionals on the classes of the information technology. There can be medical specialists in various fields of medicine and doctors, representing the various territories, administrative and geographical formations, rural hospitals, major federal facilities, with different levels of information competence. All the students are the practical medicine representatives, and the main purpose of their training is the reception new information and answers to their production problems [5].

The theory and practice of adult education as a separate phenomenon, or androgogics, began to develop in the mid of 30-ies of the XIX century. The andragogical learning specification is determined by psycho-physiological and social peculiarities of the adult learner, described by (Begnel R.G., Brendedzh V.G., Griffin K., Maklegen P.A., Knowles M.Sh., Savicevic D.M., Jones E., Vershlovsky S.G., Darinskii A.V., Zmeev S.I., Maron A.E., Monakhova L.Y., Kolesnikova I.A., etc.).

Indeed, adult learners are differentiated with the existence of life and professional experience, willingness to learn and quick implementation of the knowledge, skills. The training process is organized as a joint activity of learning and teaching in all its phases [4]. Andragogical approach is the general scientific level, in terms of which our research is issued.

Queries of the adult in the training are mainly related with the desire to raise the level of professional competence. However, in all the studies the axiomatic is the educational and professional competence of the teacher. Therefore, one of the most serious problems is the question of erudition and understanding of the medical needs in the field of computer science by teachers of the postgraduate and additional medical education cycles.

To cover the particular questions professionals are invited, programmists or professionals to track the specific software, introduces the work of medical institutions. But when you need to teach the general application of information technology, the question is: where can the teacher of computer science get training in the field of the health care?

We believe that computer science lessons for health professionals will be really high-quality and useful only when the teacher:

1. Is a professional in the field of information technology.

2. Knows medical needs in information technology. The content of the lecture material and the selection of issues for the seminars anticipate the needs of the learners.

3. Able to predict emerging needs in the products of Computer Engineering and he himself makes that contribution to form the needs health professional for new software, hardware, and software-hardware technologies.

At present the situation is changing so quickly that in order to follow the above points, the teacher must always be ready to know a wide variety of aspects of the application of information technology in medicine. The only available source of reliable, relevant, comprehensive and competent information is the health professionals trained in the cycle of postgraduate and additional education of physicians.

Therefore, a relevant question of formation approach in teaching with feedback:

– containing elements of mutually beneficial conversations created in the classroom atmosphere of partnership and mutual assistance;

– allowing the teachers to learn about the current medical needs in information technology from the «first-hand» and, according to the information received, to modify and adapt the content of the following classes of groups;

– the integrating of the context, framing, partisipar, competent and holographic approaches, process of the facilitation, and the principles of andragogy, at certain stages of providing leadership to students, and not to the teacher.

The result should be to achieve a high level of information competence for health professionals, which ultimately leads to the higher quality of medical services to the population.

The socio-historical context of the uniar approach

Medicine and science are sciences far from each other, one of them for thousands of years, the other – the centuries evolved independently. In the mid of the 20th century with the advent of electronic data processing have a common ground of science. Joint development began to appear, however, we cannot talk about the integration of these disciplines.

Integration – from the Lat. integrum (integer), Lat. integratio (restoration,) implies a mutual penetration of any element or combination of them in the whole. Therefore, the integration of science – is an association of various sciences to study some phenomena in different aspects. Using this approach, we establish common scientific concepts related to the general meaning of disciplines and teaching methods that promote the integrity of the students received scientific and technical knowledge. Certainly, the use the integrated approach to ensure the integrity of the educational activities of professional and personal growth expert, integrating knowledge into practice [2]. However, the transfer of concepts and definitions from other fields is not always successful: the technical terms in another science often becomes distorted sense.

The transdisciplinary approach to any extent (multidisciplinary or interdisciplinary) also involves the joint research or study, or one subject, object, environment, or transfer of a science research methods to study another science in order to obtain the result. The interpretation of the results is always done from the perspective of the leading discipline, which leads to a change in the image of the subject of a disciplinary investigation. Therefore, these approaches contribute to the accumulation of disciplinary and interdisciplinary knowledge, but it does not help in identifying common patterns and mechanisms of their interaction within the subject of the study [7].

In our case (science and medicine) can be seen another aspect, **which consists of the fact that we have two sciences and one of them helps the other to receive a higher level of quality, while not penetrating to the core of the parallel developing science. Moreover, the initiator of the development of the future technologies can be the inner needs only.**

The health workers do not study the database or computer architecture, and computer science cannot make diagnoses. However, being aware of the needs of physicians in clearer images obtained diagnostic equipment, computer science specialists and engineers are beginning to study the use of new and existing methods, such as mathematical filtering of the data, or creation new formats of digital data.

On the other hand, knowing the needs for the new computer architecture, based not on the classical scheme proposed in 1945 by John von Neumann, on the basis of which now operate all existing computers (with the exception of a small number of laboratory neurocomputers), specialists in the field of medicine and biology begin the study of biological neurons, the DNA cells, bacteria, which in the future may become the basis for building a new generation of computers. Implementation architectures and storage devices, cell-based DNA and bacteria, in the future transfer modern technology to a new level.

We have introduced the term uniar (unio (lat) – the union; -ar (lat) – suffix carrying value of «affiliation, attitude») indicating the principle of parallel science developing through mutual finding solutions to emerging needs. The result is the emergence of a qualitatively new technology in each of the communication sciences.

The uniar approach to education

As medicine and computer science are evolving uniarly, the doctors in training informatics and computer science elements medicine (for example, in the preparation of programmers to work in health care), it is appropriate to use this approach in teaching. The uniar approach helps in the framework of classical training to form the structure of employment in such a way that the information received by students and teachers, acted as a feedback to allow:

to the students –

– knowing the opportunity to study science, contribute (using their business and professional opportunities) implementation in health care practice new therapeutic and diagnostic devices and technologies;

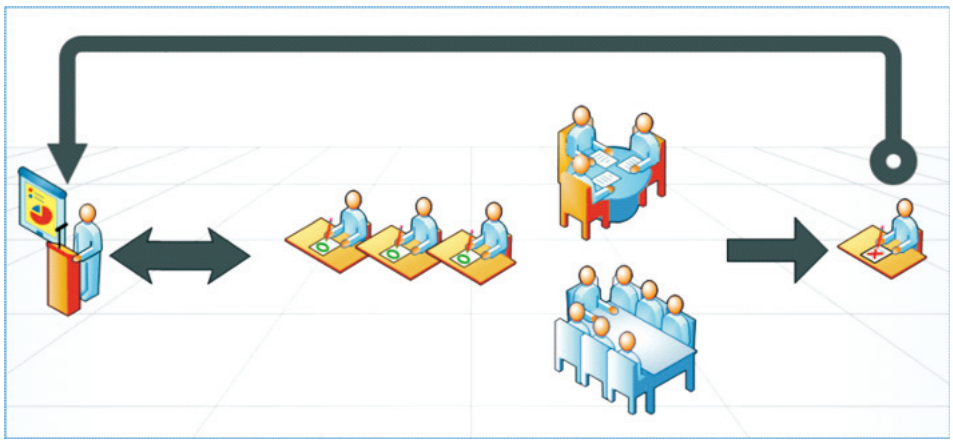
– knowing the needs of other sciences, to initiate research in the own field and contribute to the global goal: the advancement of science in general;

– improve their information competence: not only to possess the modern means of information transfer (computer, office equipment, etc.) and information technology (communication through modern digital devices and online services), but also possess erudition, which applies these devices and technologies to solve any emerging problems in practice, including the uncertainty situations and using the intelligent and heuristic methods.

To the teachers –

– learn about current needs of practical medicine in information technology and in accordance with the received information quickly modify and adapt the content of the following classes of groups.

Let's schematically represent the described approach (Figure).



Scheme of the uniar approach

The uniar approach can be represented in the form of the control process with the obligitory feedback. The task of the teacher is to organize the learning process so that the information obtained during initiated discussions, presentation of work performed by the students independently on specific health issues and their organizations and institutions, public process solutions situational problems, became that the correction module, which makes the class really relevant, useful and highly professional.

Research principles and procedures used in the determination and theoretical basis of the concept of substantive content of the uniar approach to the specific scientific level are context, framing, partisipar, competence and holographic approaches, which fully provide the basis for the formation of targeted, meaningful and operationally activity-related, control and regulation and an assessment and successful components of the pedagogical process.

Conclusions

Formation information competence of a high level for the physicians has become a necessity and is critical for the further technical progress, keeping up with the development of advanced computer and information

technologies, the development of medicine and pharmacy, manufacturing, distribution and servicing of medical devices and medical equipment, as well as other components of the health sector.

Teacher and health care professionals, students in the cycle of the postgraduate and the additional education of doctors, are the participants both in Public Health and the field of health care management.

The result of the introduction of the uniar approach in conducting classes in the postgraduate and additional education will integrate the experience, knowledge and skills of the teacher and students and make the learning experience the best for this contingent, and to lay the foundation for training in the next groups.

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