ज्ञान-विज्ञान विमुक्तये

A Multidisciplinary Indexed International Research Journal

Airo

ADHYAYAN
INTERNATIONAL
RESEARCH
ORGANISATION

ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) FOR BIOLOGY TEACHING

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ABSTRACT

The computer programs as a didactic aid are often described in didactic literature all over the world. It is not enough that they play, for instance, motivational, exercising, synthesizing or supervising function; they are to be made an independent source of reliable, easily comprehensible information, given in a way that activates students. It is also important not to replace various functions and tasks of didactic aids applied in the process of teaching-learning Biology with each other, but only to interfere skillfully. It is underlined that school practice requires methodically grounded application of these aids in the processes of teaching and educating. In this paper in selected ICT tools have been presented in the light of teaching principles and cognitive activities model. Computer science education, information and communication technology (ICT) are at present becoming one of the most important elements defining the basic competences of students. Information technology integrates medial, informative and computer science education, but also all the educational subjects mentioned in the curriculum basis of general education. In science and biology education there increasingly appear concepts of integrated teaching, showing the student the world in a holistic manner. The principle of universal activity of students in cognitive, emotional and motivation, as well as in practical sphere is preferred.

KEYWORDS: information and communication technology (ICT), biology, learning and teaching, knowledge

INTRODUCTION

Information and Communication Technologies (ICT) is a term used to denote all computer and communication technologies. ICT has become an integral part of the educational system and as a support to teachers in the implementation of the traditional teaching process as well as in the process of learning and teaching. The new educational paradigm focuses on the student – the student is placed in the center while the environments are learning resources both in terms of time and in terms of place and learning styles. It is therefore considered that e-learning can be seen as a completely independent form of education, but also as a component or a complement of classical education. We implement mixed education: a combination of classical teaching in the classroom and teaching using ICT. A popular way of describing e - learning is using the "timeline" of e-learning which shows education as a continuum on whose left side there is classical instruction. Moving towards e - learning starts with the introduction of ICT into F2F teaching. In the middle of the timeline is the mixed learning approach. Online education is located on the right end of this continuum.

Educational goals and tasks in modern scientific - technological and social changes are not and cannot be marginal pedagogical problems as they were treated by our

pedagogical science in the second half of the last century. Pedagogy, which aims to discover and explore the laws of the educational process, should approach the aims and objectives of education as basic and initial pedagogical problems. Pedagogical science should incorporate the goals and objectives of education into its categorial system, because the core understanding of pedagogical problems (raising strategy, content, forms and methods, the position of the subject) derives from it. Without such a relation of pedagogical science to the goals and tasks of upbringing it will not be possible to develop teaching methods for individual subjects as well as new strategies of teaching, learning and self-learning. Teaching methods for information education also faced this problem when it was established.

INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN EDUCATION

Ensuring universal service and access to information and communication technology is a top national objective in many countries, often enshrined in laws that govern the sector. One of the distinctive features of human beings is their ability to acquire knowledge, and what makes this knowledge an ever-thriving entity is man's ability to 'impact' this knowledge to others. Transfer of knowledge, which is one of the foundations of learning, is among the most fundamental social achievements of human beings. Building strong relationships with students is something that frequently explains why faculty takes pleasure in the challenge of working at a small university. The concept of moving the traditional classroom of desks, notebooks, pencils, and blackboard to an online forum of computers, software, and the Internet intimidates many teachers who are accustomed to the face-to-face interaction of the traditional

classroom. In the past 10 years, online instruction has become extremely popular as is evident in the rise of online universities, such as University of Phoenix Online and Athabasca University (Canada), and on-campus universities offering online courses and degrees, such as Harvard University and University of Toronto. For many students who find it difficult to come to campus due to employment, family responsibilities, health issues, and other time constrains, online education is the only option. Advancements, standards, specifications and subsequent adoptions have led to major growth in the extensibility, interoperability and scalability of e-learning technologies. E-learning is fast becoming a major form of learning. Computer multimedia offers ideal opportunities for creating and presenting visually enriched learning environments. The latest technologies associated with virtual reality will also play an important role in not too distance future. Management institutes and educators have attempted an increased incorporation of collaborative group work, problem-solving and decision-making through technology as an integral component of pedagogy. There is no doubt that technology-based tools can enhance student's cognitive performance and achievements if used appropriately, in accordance with knowledge learning and as part of a coherent educational approach. Computer-based systems have great potential for delivering teaching and learning material. The rapid development of Information and Communication Technology (ICT), particularly the Internet, is one of the most fascinating phenomena characterizing the Information Age. ICT powers our access to information, enables new forms of communication, and serves many on-line services in the spheres of commerce, culture, entertainment and education.

BENEFITS AND CHALLENGES OF ICT

Tools are now available on the Internet to assist both teachers and students to manage writing assignments to detect and avoid the pitfalls of plagiarism and copyright violations. One of the great benefits of ICTs in teaching is that they can improve the quality and the quantity of educational provision. For this to happen however, they must be used appropriately. While using ICTs in teaching has some obvious benefits, ICTs also bring challenges. First is the high cost of acquiring, installing, operating, maintaining and replacing ICTs. While potentially of great importance, the integration of ICTs into teaching is still in its infancyIntroducing ICT systems for teaching in developing countries has a particularly high opportunity cost because installing them is usually more expensive in absolute terms than in industrialized countries whereas, in contrast, alternative investments (e.g., buildings) are relatively less costly. Using unlicensed software can be very problematic, not only legally but in the costs of maintenance, particularly if the pirated software varies in standard formats. Even though students can benefit immensely from well-produced learning resources, online teaching has its own unique challenges as not all faculties are ICT literate and can teach using ICT tools. The four most common mistakes in introducing ICTs into teaching are: i) installing learning technology without reviewing student needs and content availability; (ii) imposing technological systems from the top down without involving faculty and students; (iii) using inappropriate content from other regions of the world without customizing it appropriately; and (iv) producing low quality content that has poor instructional design and is not adapted to the technology in use. The other challenge faced is that in many developing nations the basic requirement of electricity and telephone networks is not available. Also many collages do not have proper rooms or buildings so as to accommodate the technology. Another challenge is that the teachers need to develop their own capacity so as to efficiently make use of the different ICTs in different situations. They should not be scared that ICTs would replace teachers English being the dominant language most of the online content is in English. This causes problems as in many nations the people are not conversant or comfortable with English. Skills development is another important area in which ICT could be used effectively. Attempts are being made to strengthen the ICT framework for Technical and Vocational Education (TVET). The emerging discourse on the role of skill development in addressing poverty and developmental issues indicates the potential role of ICT4D. ICT can play a major role in integrating skill development as a component of a poverty alleviation strategy.

INFORMATION EDUCATION AND INTERACTIVE LEARNING

In the frame of the teaching process reforms during recent years interactive learning is increasingly being confirmed as one of the modern pedagogical innovations in our country too. Regarding the fact that information education is one of the important components of the school system reform, there is an important connection and complementarity between these two modern innovations.

Notion and essence of interactive learning and teaching

In our country there are also terminological issues about the meaning of the notion of interactive teaching, interactive learning and interactive method. Whether it is about theentire curriculum, the learning process or the

application of one method, interaction builds a new way of communicating on the relation teacher, student and curriculum content. Namely, this introduces a new interdependence, interaction and mutual action of students who study together. Accordingly "interactive learning is a process that results in relatively permanent changes in thinking and behavior that are created on the basis of experience, tradition and practice realized in social interaction.

2. Interactive learning in information education

In information education as well as in all other types of education and teaching it is reasonable to apply various types of interactive learning. Basic rules of interaction should be observed when applying interactive learning in information education, but only in the form of specific objectives and content of this education. It is therefore important to observe the following elements:

a) The main goal and task of information education;

b) The nature and character of the information content taught in an interactive manner (not all contents of information education is adequate for interactive learning);

c) The level of knowledge of methodical procedures in interactive learning;

d) The teacher's level of training for organizing and introducing various forms of interactive learning and

e) The level of students' training in interactive learning, procedures of interaction and actions of interdependence and mutual action of groups.

Today, owing to universal teaching aids, the most complex organisms can be shown to students, the farthest geographical area with endemic species can be made available, the smallest and most complicated part visible with a microscope.

CONCLUSION

Integrating computers in teaching biology allows bringing educational content closer to students, facilitation of learning, revision and acquisition of knowledge, as well as its usage. It also allows integrating the teaching process into modern technological developments. What does this kind of teaching enable? Such teaching has a lot of advantages:

1. Students develop their personalities through all aspects, at all levels, because this kind of teaching is also applicable to students with lower levels of knowledge;

2. It helps to complete a number of tasks and to advance the lesson objectives;

3. It helps students to fuse multiple types of knowledge and to expand it;

4. It encourages students to be creative and increases the research method;

5. Students acquire the habit of turning their individual work into collective work because they will be networked into joint work etc.

6. The teacher has feedback on the level of students' knowledge

7. All students will be engaged in the teaching content

8. There are questions of different nature

9. All students repeat the teaching unit

10. Through revision of the teaching material the students will further acquire a certain degree of knowledge.

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