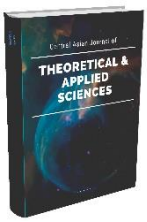

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Smart Learning as New Educational Model

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Abstract. *The paper analyzes teachers' and students' attitude to a newly accepted SMART learning model, reveals peculiarities of SMART education. The conducted research allows drawing the following conclusions: teachers accept importance of SMART technologies and recognize the potential of SMART learning environment in improving the educational process quality, however, they failed to develop a subjective position on the problem of SMART technologies introduction.*

Introduction

The term "SMART" has recently become an incredibly popular buzzword used in a variety of contexts, from food to scientific systems. Initially, the concept of "SMART" arose primarily in the technological aspect. The "SMART" label is used when something has been technologically improved, or the product has been adapted to human needs through some technological solution, or even when a new version of the product is developed with some (minor) technological improvements.

The terms "SMART-education", "SMART-training", "SMART-technologies", "SMART-environment" are currently entrenched in the pedagogical lexicon. A new educational paradigm is actively developing - SMART education, which implies the formation of new guidelines and models of education in the information society. The creation of a SMART learning model presupposes the need to introduce modern high-tech, intelligent, comfortable systems for students and teachers into the educational space. SMART learning is "SMART learning", implemented in an interactive space using open resources of the entire global community. This model meets the requirements of innovation, flexibility to changes occurring in society, and adaptability to the growing needs of students.

The study of the attitude of teachers and students to the new educational model of SMART learning seems to us to be an urgent pedagogical problem associated with the value rethinking and understanding of innovative methods and technologies of interaction in the information and educational environment.

To achieve this goal, it is necessary to solve the following research problems:

- study the essence of the concept of "SMART learning" in the context of the new educational paradigm;
- identify the attitude of the teaching community and students to the educational model "SMART-learning".

During the study, the following methods were used: theoretical (analysis and synthesis of normative documentation and scientific literature on the problem of implementing SMART education; methods of qualitative analysis of documents and products of teachers' professional activities, modeling); empirical (observation, questioning); methods of mathematical processing of research results.

The theoretical basis for the study was the work of such authors as B. L. Agranovich [1], A. G. Asmolov [2], L. M. Mitina [3], P. D. Rabinovich, K. E. Zavedensky, M. E. Kushnir, Yu. E. Khramov, A. R. Melik-Parsadanov [4], O. Yu. Rybicheva [5], V. P. Tikhomirov [6] and foreign authors such as K. Glasswell, K. Davis, P. Singh and S. McNaughton [7], D. Gwak [8], J. J. Hwang [9], S. Jang [10], T. Kim, J. W. Chu, B. G. Lee [12], J. Lee et al. [13], A. Middleton [14], K. Murai, Y. Hayashi, L. K. Stone and S. Inokuchi [15], K. Scott and R Benlamri [16], E. R. Sykes [17], Z. T. Zhu and B. He [18], Z. T. Zhu and D. M. Shen [19], whose publications reflect the main characteristics of smart training.

The practical significance of the work lies in the possibility of using the results obtained in teaching practice for the development of the modern educational process in the context of the implementation of SMART education.

Characteristics of SMART education as a new educational model SMART education aims to provide holistic education to schoolchildren and students using modern technologies to fully prepare them for a rapidly changing world where the ability to adapt is critical.

As a new educational model, "SMART education" or "SMART learning" is based on smart devices and smart technologies [14]. Technology-assisted learning (TEL - Transforming and Educating for Life) provides flexibility in the process of acquiring new information. These technologies are represented by media or tools for accessing learning content [8], inquiry, communication and collaboration, construction [11], expression [19] and performance evaluation [16] in TEL.

There is no clear and uniform definition of "smart learning" yet. Multidisciplinary researchers and education professionals continually discuss the concept of SMART education. However, some important components have found their way into the scientific literature.

J. G. Hwang, K. Scott and R. Benlamri believe that SMART learning is ubiquitous learning that takes into account the context [9; 16]. D. Gwak characterized the concept of SMART learning as follows: firstly, it is focused on students and educational content more than on devices; secondly, it is effective, intelligent, individual training based on advanced IT infrastructure. Technology plays an important role in supporting smart learning, but the focus should not only be on the use of smart devices [8]. T. Kim, J. W. Chu, B. G. Lee believe that smart learning, combining the advantages of social learning and ubiquitous learning, is an educational paradigm that focuses on the learner and education, and not just on the use of devices [12, p. 173]. J. Lee proposed that the functions of smart learning include formal and informal learning, social and collaborative learning, personalized and situational learning, and application and content orientation [13, p. 1084].

SMART learning is based on five elements derived from the SMART acronym:

1) "self-directed" characterizes the change in the roles of students as recipients of knowledge and the transformation of teachers from disseminators of knowledge into learning assistants (mentors). For this purpose, online assessments, performance assessments and a self-paced learning system are also being introduced;

2) "motivated" emphasizes how SMART learning encourages students to become interested in learning. SMART learning emphasizes teaching and learning methods that promote creative problem solving and process-oriented individual assessment. The learning experience of students is transformed from theoretical learning experience to practical one;

3) “adapted” means continuing education through an individualized educational system and an individualized teaching and learning system. SMART learning increases flexibility about future career aspirations. It also helps educational institutions transform from a place of knowledge transfer to a place that supports personalized learning according to students' levels and abilities;

4) “rich in resources” describes the support of various materials for teaching and learning. SMART Learning provides free access to extensive content developed by public and private institutions and individuals in the education sector through a cloud-based learning platform, enhances the sharing of domestic and international learning resources, and promotes collaborative learning through content broadcast platforms;

5) “embedded in technology” shows the use of the latest information and communication technologies. SMART learning allows students to learn anytime, anywhere with the help of information technology. An educational environment is created that encourages student-centered learning, and students are provided with a variety of learning methods tailored to their chosen areas of interest.

Smart education is considered the most progressive stage of changing education with the help of new ICTs. As researchers have consistently emphasized, smart education is undoubtedly an important prospect for modernizing educational systems, aimed at bringing education in line with the demands of today's fast-paced world and creating an education system that can survive the ongoing technological revolution. Many studies confirm the effectiveness and attractiveness of SMART training [7; 15].

An analysis of the relevant literature leads to the identification of three main positions supporting smart education: (1) mobile technologies, (2) digital textbooks and (3) cloud technologies.

1. Mobile technology is a key technology for SMART learning because it is a strategy for learning everywhere based on individual learner preferences. Using smartphones, tablets, and other portable devices, students can complete learning assignments anywhere, even outside the traditional school building. Research conducted by E. R. Sykes [17] shows that the use of mobile devices in education increases learning efficiency.

2. According to S. Jang, a digital textbook is a “future-oriented”, technologically improved and more attractive textbook [10, p. 76]. In addition to the functions of a traditional textbook, the digital version also acts as a self-study notebook, workbook, and dictionary. It also contains various innovative tutorials. In addition, the digital textbook uses advanced technological elements such as video, animation, virtual reality, or hyperlinks. The digital textbook is also interactive and therefore adapts to the abilities, skills and level of each student. The digital textbook operates in a so-called N-screen environment (sometimes called three-screen, referring to three main contexts of use: Internet, mobile phone, TV), so it can be used on any screen - computer, tablet, smartphone, TV.

3. Cloud technology is a widely used term that involves a number of ambiguities regarding its definition. In its simplest form, cloud technology is a strategy for transferring various types of programs or materials from personal computer disks to a network (cloud) so that they can be used anywhere and, on any device, [11]. In terms of education, cloud technology, simply put, is a technology cloud that stores educational materials in various formats (text, film, sound, etc.). This cloud hosts applications and educational programs, as well as communication tools used by various stakeholders in the field of education (students, teachers, parents, educational administrations, etc.). From a technological point of view, this cloud is available on all devices (smartphones, computers, TVs, etc.), making the learning process accessible anywhere and anytime.

A. Middleton [14] also discusses the student-centered aspects of SMART learning and the benefits of using smart technologies. Modern technology encourages students to engage in learning and increase their independence in more open, connected and empowering ways through richer personal context.

B. P. Tikhomirov speaks of SMART education as a new concept that involves a comprehensive modernization of all educational processes, as well as methods and technologies used in these processes. The SMART concept in education entails the emergence of technologies such as smart boards, smart screens, and Internet access from anywhere.

B. L. Agranovich claims that each era created its own type of education on the basis of the corresponding socio-economic and cultural basis of society [1]. The traditional class-lesson education system of J. Comenius, created in the 17th century, has outlived its usefulness in the conditions of the emerging post-industrial society, since it was built on other socio-economic and cultural foundations. The author talks about the need to create an education system for a post-industrial society, the socio-economic and cultural foundations of which fundamentally pose the task of transition from the era of education to a new era of SMART self-education, for which all the necessary prerequisites have been created in the fifth technological order.

A. G. Asmolov, P. D. Rabinovich are the authors of the concept "Technosphere of an educational institution," which is based on the ideas of an open, variable educational space. In addition, A. G. Asmolov emphasizes the importance of a system-activity approach in education, based on theoretical

provisions of the concept of L. S. Vygotsky, A. N. Leontyev and others, focused on the practical educational and cognitive activity of children, the formation of the younger generation, motivated to acquire and develop modern competencies [2].

O. Yu. Rybicheva notes that the broader concept of SMART education is characterized by domestic and foreign scientists as an educational paradigm, educational environment, educational system, educational network, educational process. The definition of SMART education as a paradigm is based on its identification as a new conceptual idea for the development of education, based on the implementation of an adaptive educational process and the use of intelligent information technologies. Considering it from the perspective of the educational environment leads to the identification of the created intellectual environment as one of the main elements of SMART education, along with SMART students and SMART pedagogy. The essence of a systematic approach to defining the concept of "SMART education" lies in seeing it as a system that ensures that citizens acquire the necessary knowledge, skills, abilities and competencies using the Internet, interaction with the environment and the process of education and upbringing. A feature of the network approach is the consideration of SMART Education as education organized on the Internet by the common efforts of educational institutions and teaching staff on the basis of common standards, agreements and technologies.

The research framework based on this definition is reflected in Figure 1.

This structure reflects the three main elements of SMART learning: SMART environment, SMART pedagogy and SMART learner. SMART education emphasizes the ideology of striving for better education and therefore logically transforms into SMART education, which satisfies the need for smart pedagogy as a methodological problem and smart learning environment as a technological problem. SMART environments can be significantly influenced by SMART pedagogy. SMART pedagogy and SMART environments support the development of SMART students.

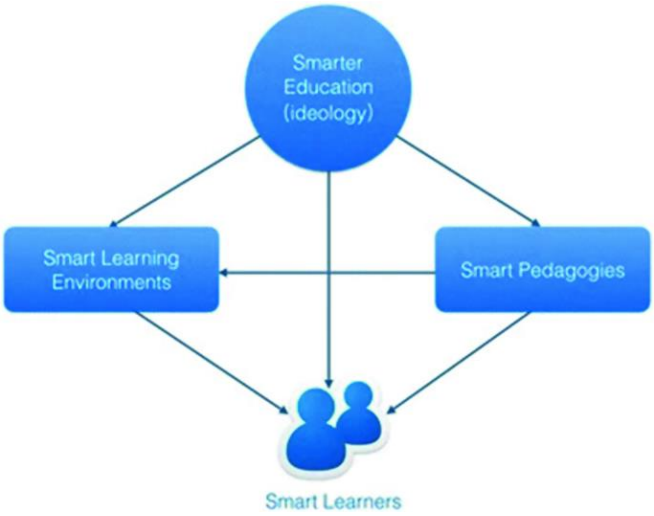

Figure 1. Structure of SMART education

Thus, we can argue that there are different interpretations of the concept of "SMART education", but they have much in common: SMART education is defined as an independent, motivated, adaptive model of the educational process, enriched with information resources and built into modern educational technologies. Additionally, SMART education offers a paradigm shift in the way students access education. It aims to provide a holistic educational process using modern smart technologies to fully prepare students and teaching staff for a rapidly changing world where adaptability is critical.

Modern technologies of the education system

The need of the times created the need to create a public educational information network with a single information resource area that combines information materials intended for educational, national, youth and children's institutions and organizations in the national telecommunication system.

Nowadays, one of the best ways to educate students using modern technological tools is the E-Learningsystem.

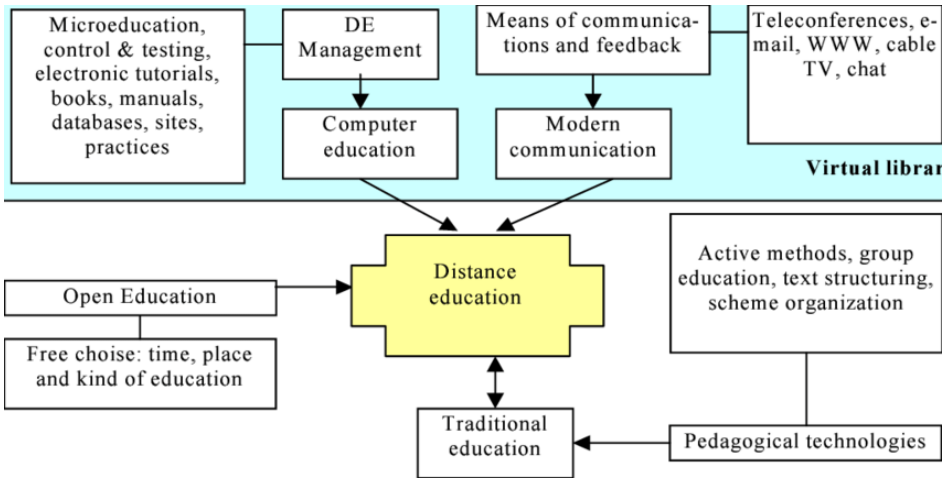

Figure 2. The general structure of the E-Learning system.

In order for teachers and specialists who teach students in various subjects to use information technology tools, it is necessary to increase their knowledge levels in this field. In this case, it is possible to achieve an effective result only by providing technical support to all departments of educational institutions and by fully creating opportunities to use the Internet. The implementation of E-Learningcreates a competitive environment for traditional and distance education, which in turn improves the quality of the traditional

education system, as it improves its competitiveness in the general education system. tends to ride and increases the general level of education (Fig. 3).

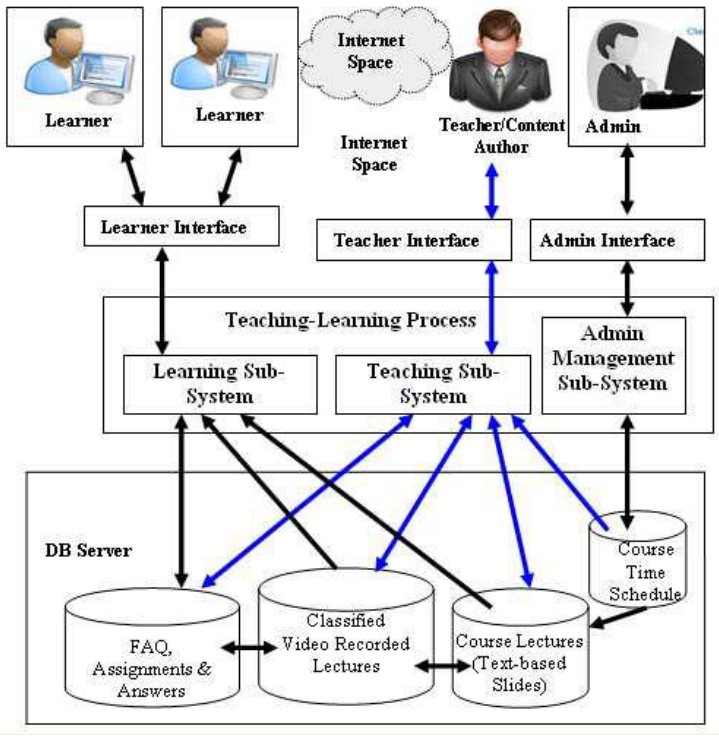

Figure 3. Functional scheme of E-Learning system.

Regardless of the place of residence, it opens a wide path for training and retraining of personnel on the basis of additional professional education program. Distance education differs from traditional forms of education by the following characteristics.

Adaptability. It is characterized by the availability of the opportunity to study at any time, place and pace, as well as the unlimited amount of time devoted to mastering the subject.

Modularity. Formation of educational plans that meet individual or group needs from independent subject courses-modules.

Parallelism. Education in parallel with professional activity or studies at other educational institutions.

Coverage. At the same time, the majority of students refer to several sources of educational information (electronic libraries, information bases, knowledge bases, etc.). To communicate with each other and teachers through communication networks.

Economic. Effective use of classrooms, technical means, presentation of educational information in an embodied and unified manner and multi-access to it, reduction of costs of organization of educational processes.

Technologic. The use of new achievements of information and telecommunication technologies in the educational process ensures that a person enters the world of information.

Social equality. Equality of access to education, regardless of where the student lives, the state of health and financial support.

Internationality. Export and import of world achievements in the educational service market.

The new position of the teacher. Distance education expands and renews the position of the teacher, coordinates the process of learning, constantly improves the taught courses, and the demand for innovations and innovations in his creative activity and specialization increases accordingly.

As a result, we present a SMART educational platform that assesses students' knowledge online and meets the requirements of the times. To use the online system, we need a computer or a device that can access the Internet. It must have browser software to access the Internet. We need to start it and write the name of the smartlearn.uz site in the URL address. After that, the window shown in the first picture below will open (Fig 4).

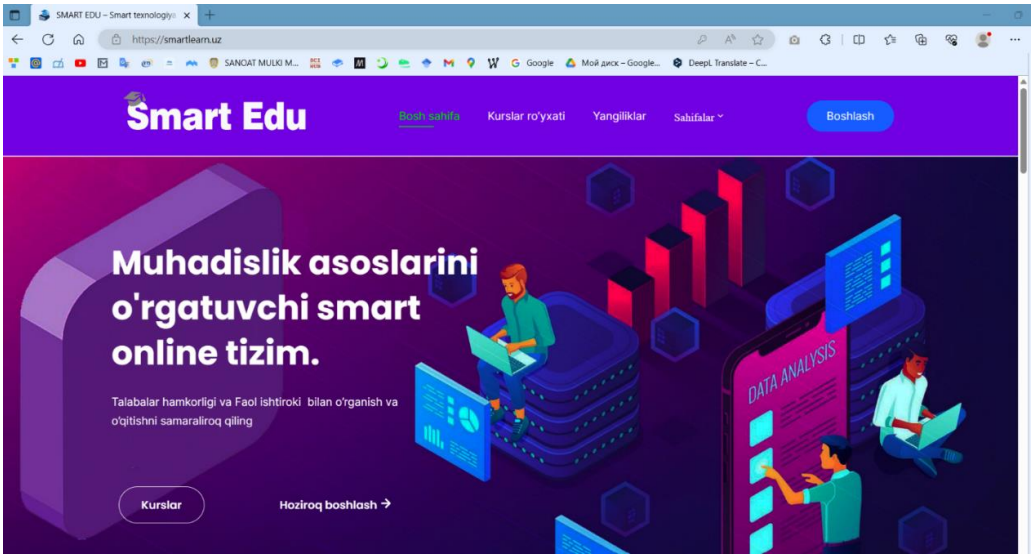

Figure 4. Home page of the SMART online system.

After logging into the system through the learner role, the user selects the course he needs. For this, he selects the Course List section from the menu bar, and as a result, all the courses available in the system are displayed to the user.

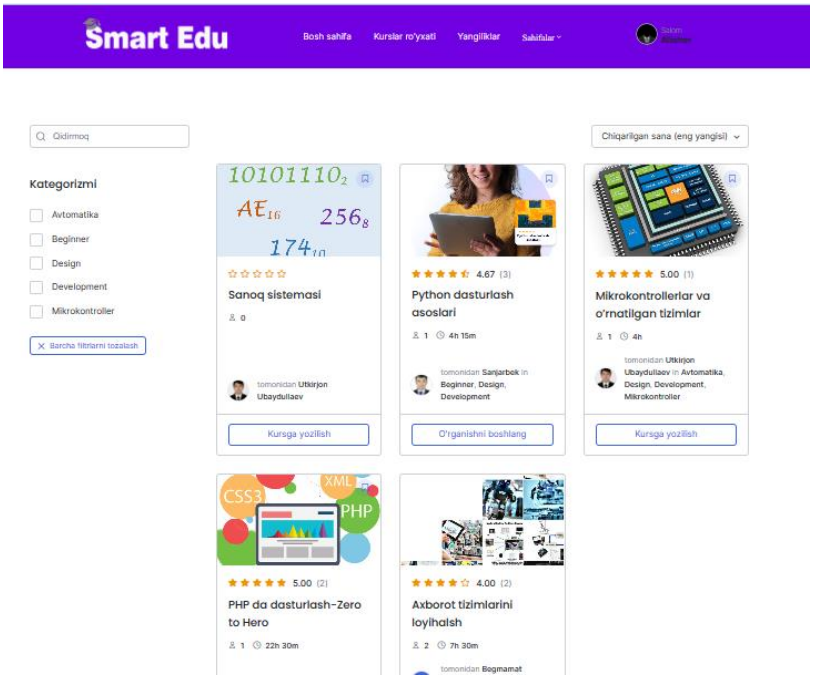

Figure 5. Online course list page.

The advantage of the course is that during the learning process of the course, video lessons are given, and the results of virtual laboratories and various interactive methods are used to evaluate the knowledge.

Conclusion

The theoretical analysis of the research problem showed that SMART education is a new model in global education that can improve the quality of education, focused on contextual, personalized and continuous learning, which contributes to the development of the student's intelligence and develops the ability to solve problems in a modern "smart environment".

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