TAJIKISTAN

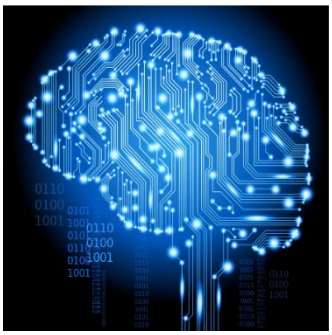
Ministry of Education and Science of the Republic of Tajikistan

Tajik Technical University named after academician M. Osimi

Technological University of Tajikistan

Khorog State University named after M.Nazarshoev

THE CONCEPT
of adaptation of the higher education system to the digital generation in the Republic of Tajikistan



With the support of the Erasmus+ programme of the European Union

2019

Result Number:	WP 2.2
Title:	The concept of adaptation of the higher education system to the digital generation in the Republic of Tajikistan
Result Type:	Product
Distribution Level:	National level
Status / Version:	final
Date:	September 25, 2019

The main drafters of the Concept:
1. Navruz Tabarov
2. Mamadamon Abdulloev
3. Gulnora Anvarova
4. Mirzo Yusupov
5. Sayfiddin Nazarov
6. Olga Sayfullaeva
7. Anboz Davlatkadamov

Persons contributing to the development of the Concept:
1. Davlatzoda Saifiddin - Deputy Minister of Education and Science of the Republic of Tajikistan
2. Odinazoda Haydar - rector of Tajik technical University named after acad. M.S. Osimi
3. Amonzoda Ilkhom - rector of Technological University of Tajikistan
4. Jonmamadov Shermamad - rector of Khorog State University named after M.Nazarshoev

This Concept was adopted by the Academic Councils:
Tajik Technical University named after academician M. Osimi
(Protocol #1 dated 30/09/2019),
Technological University of Tajikistan
(Protocol #1 dated 30/09/2019),
Khorog State University named after M.Nazarshoev
(Protocol #1 dated 27/09/19),
and also agreed with the Ministry of Education and Science of the Republic of Tajikistan.

This document has been prepared with the support of the EUROPEAN COMMISSION under Erasmus+, Capacity Building in Higher Education: 598092-EPP-1-2018-1-BG-EPPKA2-CBHE-SP. It reflects only the views of the authors and the commission cannot be held responsible for any use of the information contained in it.

INTRODUCTION

"If we teach today's students as we taught yesterday's, we rob them of tomorrow.."

JOHN DEWEY
Philosopher
and education reformer

"A bad teacher presents the truth, a good teacher helps to find it"

ADOLF DISTERWEG
outstanding pedagogue-democrat, creator of didactics developmental learning

A generation of seven screens - a TV, a computer, a tablet, a phablet, a smartphone and a smart watch - cannot and should not be trained just like his parents did. When teaching this generation, you cannot write in white chalk on a black board. Replacing a black board with white and a chalk with a marker does not change anything, i.e. this is not a way to motivate modern students to acquire knowledge and develop skills for successful implementation in the labour market.

The paradox of modern education is that "digital natives" are taught in schools by "digital immigrants". In classrooms, students often get the feeling that teachers are foreigners who speak inaudible and with a strong accent.

It is necessary to adapt the education system to the digital generation by mass and effective application of ICT-based innovative educational technologies and didactic models. Along with this, it is necessary to more actively use the research approach to teaching, which is aimed at developing students' skills in scientific research and at the formation and development of creative abilities.

But we must emphasize that information and communication technology is not a panacea for all problems in the education system, but a tool that can make lectures and seminars more informative and attractive for the digital generation. **TEACHERS WILL KEEP THEIR KEY ROLE IN THE INTERACTIVE LEARNING PROCESS ORIENTED TO THE NEEDS OF STUDENTS.**

It should also be noted that the teachers' reputation and the effectiveness of their activities will increasingly depend not only on the level of knowledge, of the course content and on their pedagogical abilities, but also on the extent to which they apply modern information and communication technologies for collecting, processing and **TEACHING SPECIFIC EDUCATIONAL MATERIAL.**

In other words, education in the digital age must be redefined, and the educational paradigm must be changed, **BECAUSE STUDENTS DO NOT LIKE TO LEARN IN THE TRADITIONAL METHOD, AND TEACHERS SHOULD NOT CONTINUE TEACHING IN THE USUAL WAY.**

BACKGROUND

1. DIGITAL EDUCATION ACTION PLAN 2020, adopted by the European Commission.

2. Priorities of the European Commission Education, Audiovisual and Culture Executive Agency, published in 2018. One of them is aimed specifically at **"MODERNIZING HIGHER EDUCATION THROUGH NEW EDUCATIONAL TECHNOLOGIES".**

3. STATE STRATEGY "INFORMATION AND COMMUNICATION TECHNOLOGIES FOR THE DEVELOPMENT OF THE REPUBLIC OF TAJIKISTAN", approved by Decree of the President of the Republic of Tajikistan dated November 5, 2003 No. 1174, which discloses organizational, economic and financial mechanisms for implementation, which are based on the principles of a program-oriented approach based on monitoring and transparency of execution. The strategic importance of information technologies for the Republic of Tajikistan is substantiated, and tasks are formulated.

4. MESSAGE FROM THE LEADER OF THE NATION, THE PRESIDENT OF THE REPUBLIC OF TAJIKISTAN EMOMALI RAKHMON MAJLISI OLI OF THE REPUBLIC OF TAJIKISTAN (2016). "... To ensure the advancement of the fields of science and education as a priority area of social policy, the Government uses all the necessary opportunities, while giving priority to the development of technical and natural sciences, takes the necessary measures to improve the level and quality of education, introduce and expand the use of information and communication technologies, including the Internet in the training system, attaches great importance to the effectiveness of educators and improving their pedagogical skills ... ".

TARGET

The aim of the concept is to adapt the education system to the digital generation by developing and effectively applying innovative educational technologies and didactic models in teaching, thereby providing the opportunity for **EVERYONE** to study at **ANY** time and in **ANY** place with the help of **ANY** teacher, using **ANY** end device - a computer, laptop, tablet, phablet, smartphone, etc.

TASKS

1. KEEPING AND GUARANTEEING THE LEADING ROLE OF TEACHERS BY MEANS OF:

1.1. Writing a Guide to Innovative Educational Technologies.

1.2. The publication of the Guide and its distribution to all teachers in:

- paper version;
- interactive multimedia format on the Internet.

1.3. Creation of a public virtual library of video lectures on the main topics of the Guide.

1.4. Creation of a national network of centers for innovative educational technologies.

1.5. Organization and conduct of training courses for teachers on the following topics:

- use of interactive presentation systems;
- development of interactive, multimedia and Internet-related presentations for lectures and seminars;
- real-time distance learning using:
  - interactive presentation systems;
  - video conferencing systems;
  - virtual class rooms;
- conducting distance learning at any time using e-learning resources in:
  - text / graphic format;
  - video format;
- use of cloud technologies;
- use of 3D printing for the development of didactic materials;
- digital didactics and digital learning models;
- augmented reality technology.

1.6. When designing a lesson, a teacher should rely on the principles of a cultural-activity approach and developing education:

- The principle of active involvement of students in the development of the proposed information;
- principle of activity;
- principle of accessibility;
- systematic principle;
- principle of motivation;
- The principle of openness of the content of education.

1.7. To preserve his traditionally honourable place, a teacher should:

- enjoy academic freedom in research and speeches on educational issues;

- actively participate in the work of specialized committees for the selection and promotion of gifted young people;
- replace passive forms of education with discussions, seminars, symposia, introduce students' research work;
- contribute to the development of continuing education.

1.8. The teacher must overcome the negative foundations of pre-industrial and industrial society, which required him to prepare the student for an exact copy of the life of his parents, a predetermined system of social inequality.

1.9. A modern teacher should:

- be a developed and advanced person, to be able to adapt to the needs of the digital generation;
- be able to prepare their students for personal and social behaviour in the digital age;
- adapt and continuously improve training modules according to the requirements of the digital generation;
- have digital competence - the willingness and ability of a person to apply information and communication technologies confidently, efficiently, critically and safely in different areas of life:
  - information and media competence;
  - communicative competence;
  - technical competence;
  - consumer competence.

2. DEVELOPMENT OF TRADITIONAL TRAINING:

2.1. Building a reliable and fast broadband wireless Internet infrastructure at all universities.

2.2. Equipping all classrooms with interactive presentation systems, including laptops.

2.3. Providing educational software in various disciplines.

2.4. Teacher training to create and use shared cloud resources in teaching and learning.

2.5. Equipping all classrooms with easily movable furniture, which will allow quick transformation of seating arrangements, so that the learning environment is better suited for teamwork and project work with digital support.

2.6. Using effective feedback systems during lectures.

2.7. Equipping the common areas of universities with interactive information screens (kiosks) that provide up-to-date information, including information about social, cultural, sports and other events.

2.8. Improving traditional teaching methods through the use of software and hardware.

3. DEVELOPMENT OF ELECTRONIC, MOBILE AND LOCAL LEARNING:

3.1. Improving the virtual learning environment of the university - the e-learning platform.

3.2. Publishing lectures and seminars of all main courses on the e-learning platform in:

- text / graphic format;
- video format.

3.3. Creating virtual laboratories for engineering courses.

3.4. Creating electronic interactive multimedia educational materials.

3.5. Digitalizing the library funds and their publication in a virtual library.
3.6. Creating an interuniversity fund of digital educational resources.
3.7. Creating various educational applications that provide the opportunity for EVERYONE to study at ANY time and ANY place with the help of ANY teacher, using ANY device - a computer, laptop, tablet, phablet, smartphone, etc. for all types of gadgets.

4. DEVELOPMENT OF BLENDED LEARNING (traditional + e-learning) as the main way of training specialists with the appropriate skills necessary for successful functioning in a digital society.

4.1. Transfer of text information from the screen, knowledge transfer (the text is read by the program). Possibility to repeat exactly the same content. Hyperlinks allow to quickly find the information needed.
4.2. Multimedia visualization of objects, processes and operations:

- virtual transformation of objects in space and on the plane;
- visualization of processes impossible to consider in real conditions. The information is better absorbed, since all the senses are involved.

4.3. Virtual practical action, planar and spatial modelling of objects, automation of individual operations. Logical processing of practical material takes place, the number of organizational activities decreases.
4.4. Fast and objective assessment of results using machine instruction and control. Operational self-assessment and correction of results.

5. USE OF OTHER INNOVATIVE EDUCATIONAL TECHNOLOGIES:

5.1. Using smartphones in education and turning them into personal virtual assistant for students.
5.2. Use of social networks in the educational process.
5.3. Online training.
5.4. Gamification of the educational process.
5.5. Use of artificial intelligence in the educational process.
5.6. Creation of training companies at universities.
5.7. Creation of conditions for giving universities the status of INNOVATIVE UNIVERSITY.
5.8. Creation of a virtual university - a model of a university in a virtual educational space, i.e. a website that provides not only comprehensive information about the university, but also a full range of administrative and educational services, and most importantly - effective distance learning.

6. USE OF INNOVATIVE EDUCATIONAL TECHNOLOGIES IN TRAINING STUDENTS WITH SPECIAL EDUCATIONAL NEEDS

6.1. Creation of interactive educational tools for students with special educational needs.
6.2. Develop an e-learning platform for students with special educational needs.
6.3. Training teachers to use specialized methods and tools for students with special educational needs.

7. USE OF INNOVATIVE EDUCATIONAL TECHNOLOGIES FOR ATTRACTING AND TRAINING STUDENTS FROM THE WORLD

7.1. Improving the methodological and technical qualities of MOOCs.
7.2. Opening education to external requests;
7.3. Application of design methods;
7.4. Competitive identification and support of leaders who successfully implement new approaches in practice.

8. USE OF INNOVATIVE DIDACTIC MODELS

8.1. Transformation of traditional didactic models into innovative models using innovative educational technologies.
8.2. The need to prepare special teaching aids and training programs is determined by the following:

- The use of the Internet today is an integral part of the digital generation lifestyle and an important factor in their socialization;
- The digital competency of adults and adolescents is approximately one third of the highest possible level;
- The vast majority of adolescents and adults have learned to use the Internet on their own, haphazardly and disorganized;
- Both adolescents and adults express their interest in enhancing digital competence;
- Teenagers actively use the Internet for educational purposes. A significant portion of parents are aware of the educational potential of the Internet;
- Parents have high expectations for school. The school does not yet enjoy authority among adolescents in the field of mastering the capabilities of the Internet and its safe use.

9. IMPLEMENTATION OF A RESEARCH APPROACH TO EDUCATION

9.1. Continuation and expansion of the university subscription to the use of world electronic educational resources, including electronic libraries, databases, laboratory protocols, etc.
9.2. The introduction of digitalization tools of the highest complexity: digital analytics based on BigData, Blockchain, Artificial Intelligence, Data Science technologies in the educational process.
9.3. Stimulation of scientific, technical and innovative activity.
9.4. Formation of the regulatory framework for innovation.
9.5. Involvement of the scientific and scientific-technical potential of the teaching staff in innovative processes.
9.6. Effective use of scientific and technological developments and inventions.

10. ANALYSIS OF RESULTS FROM IMPLEMENTATION OF INNOVATIVE EDUCATIONAL TECHNOLOGIES AND DIDACTIC MODELS

10.1. Development of indicators of digital education to ensure reliable measurement of the changes made in the digitalization of universities. Ensuring strong competition between universities.

10.2. Development of a metrological standard for the quantitative and qualitative assessment of the digital skills of university staff and digital content.

11. POPULARIZATION AND REPRESENTATION OF RESULTS AND GOOD PRACTICES through:

11.1. Media.
11.2. Regional and national workshops.
11.3. National and international conferences.
11.4. Social networks.
11.5. National network of centers for innovative educational technologies.
11.6. Hackathons
11.7. IT clubs
11.8. Startup projects

DEPARTMENTS RESPONSIBLE FOR THE IMPLEMENTATION OF THE CONCEPT (PLAN):

- At the national level:
  - Ministry of Education and Science;
  - Ministry of Finance;
- At the regional level:
  - rectors of universities;
  - deans of faculties;
  - heads of departments.

FINANCING

- From projects in the framework of regional, national and international programs;
- From sponsorships and donations;
- From the budget of the university.

ADDITION

WHAT DO YOU NEED TO KNOW IN ORDER TO START THE DIGITAL TRANSFORMATION OF EDUCATION?

1. In the field of traditional education:

- use an interactive whiteboard / interactive monitor;
- create interactive, multimedia, and internet connected presentations for lectures.

2. In the field of synchronous distance learning (in real time):

- use a video conferencing system;
- use a virtual classroom.

3. In the field of asynchronous distance learning (in arbitrary time):

- make and publish online multimedia teaching aids;
- record and publish video lectures;
- use cloud technology.

4. In the field of blended learning, optimally combine traditional and electronic forms of instruction for maximum effect.

GLOSSARY

Flipped classroom - a learning strategy that changes the traditional learning environment: what is usually done in the classroom, and what is usually done as homework, is turned around. The principle of the flipped classroom is that the work, usually done as homework, is performed in the classroom under the guidance of a teacher.

Andragogy is a section of the theory of instruction that reveals the specific patterns of the development of knowledge and skills by an adult subject of educational activity, as well as features of the guidance of this activity by a professional teacher.

Virtual library is a set of resources available in one or more computer systems, where one interface or entry point to the collection is provided.

Virtual classroom is an online learning environment that allows teachers and students to communicate, interact, collaborate, explain ideas, and use learning resources while working in groups.

Virtual laboratory is an interactive environment for creating and conducting simulation experiments: a platform for experiments. It consists of domain-specific modeling programs, experimental blocks called objects that span data files, tools that work with these objects.

Virtual reality is an artificial environment that entails an immersion in digital modeling of a world in which users can manipulate objects and interact with the environment.

Virtual university is a model of a university in a virtual educational space, i.e. multi-service cross-platform application that provides all types of educational services.

Gamification is the application of game principles and mechanisms in the learning environment to increase motivation and involvement in the learning process.

Didactic model of learning is a visual model of the learning process, which includes forms, methods, training tools, organization of the learning process and the interaction of participants in the learning process. The structure of the model, the logical connections in it are justified and presented in different ways, in the form of a “tree”, “concentric circles”, “spirals”, “steps”, etc.

Augmented reality is a technology that adds digital information (images, video, text, graphics, 3D models, etc.) to the real world to the physical elements of the environment, images or objects.

Innovative educational technologies - the technology of purposeful, systematic and consistent implementation of innovative methods, methods of pedagogical actions and means, covering a holistic educational process from setting goals to expected results.

Interactive table - an interactive surface equipped with a high-resolution touch screen, with the functions of a modern computer.

Internet of Things (IoT) is a network of things with sensors or chips that are connected to the Internet and interact with the real world.

Internet of everything is a common interconnected system that encompasses people, data, processes and things, the purpose of which is to transform information into actions, improve experience and make decisions based on data.

Mobile Learning - Learning using mobile technologies such as laptop computers, tablets, MP3 players and smartphones to support the teaching and learning process. Access to educational resources can be obtained from the device that the student always carries with him.

MOOC (mass open online courses) - a type of course that is fully offered online, is available to all comers without any costs, qualifications or other restrictions and has a large number of participants.

Cloud technologies (or cloud computing, cloud computing) are technologies of distributed processing of digital data by which computer resources are provided to an Internet user as an online service.

Smart education is a concept that describes learning in the digital age, the applied intellectual learning environments represent a new wave of educational systems, involving the effective and efficient interaction of pedagogy, technology and their merger in order to improve learning processes.

Blended learning is a type of learning that combines classroom and online learning. Classes are taught both by teachers and computer devices.

Digital didactics is the science of learning, providing a rationale for its content, methods and means, the organization of the learning process in a digital society.

Hackathon is a forum of developers during which specialists from different areas of software development (programmers, designers, managers) together solve a problem for a while.


SOCIAL NETWORK
SHARE


time for change