



THE REPUBLIC OF UZBEKISTAN

	MINISTRY OF HIGHER AND SECONDARY SPECIAL EDUCATION OF THE REPUBLIC OF UZBEKISTAN
	TASHKENT UNIVERSITY OF INFORMATION TECHNOLOGIES NAMED MUHAMMAD AL-KHWARZMI
	TASHKENT STATE UNIVERSITY OF ECONOMICS
	ANDIJAN MACHINE-BUILDING INSTITUTE

CONCEPT for adapting the higher education system to the digital generation



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

Tashkent - 2019



Editor: Yusupov Sabirjan Yusupdjanovich
Result number:: WP 2.2
Title: CONCEPT
for adapting the education system
to the digital generation
in the Republic of Uzbekistan
Result type:: Product
Distribution level: National level
Status / Version: final
Date of: November 25, 2019

Concept was compiled by representatives of the partner universities of the HiEdTec project: “Modernization of Higher Education in Central Asia through New Technologies” of the Erasmus+ program of the European Commission and the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan.

This Concept is adopted by the following Councils:

Tashkent University of Information Technology
named after Muhammad al-Khwarizmi
(Minutes No.2 (295), September 26, 2019,

Tashkent State University of Economics
(Minutes No.2, September 30, 2019),

Andijan machine-building institute
(Minutes No.2, October 2, 2019),

and also agreed with the Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan.

This document has been produced with the support of the European Commission under the ERASMUS+ Programme, KA2 – Capacity Building in the Field of Higher Education: 598092-EPP-1-2018-1-BG-EPPKA2-CBHE-SP. It reflects the views only of the authors, and the Commission cannot be held responsible for any use, which may be made of the information contained therein.

No part of the report may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording; and may not be quoted or cited, without prior permission in writing from the Project Coordinator.



INTRODUCTION

JOHN DEWEY,
*Philosopher
and education reformer
1859-1952,*
***“If we teach today's students
as we taught yesterday's,
we rob them of tomorrow”***

“Creating a digital industry of the future” - ensuring long-term sustainability, launching the country's digital transformation by increasing the level of human capital development. Today's classrooms are much different than they were a decade ago and classrooms have computers, iPads, and Smart boards, and other types of technology in the classroom.

In Uzbekistan, as elsewhere in the world, a digital generation has emerged, a generation of seven screens - a TV, computer, tablet, phablet, smartphone and smart watch. As a result of the presence of such a dense digital environment and constant interaction with it, the thinking of today's students and information processing procedures are fundamentally different from the ways of thinking and the information processes of their predecessors.

The digital generation cannot and should not be trained in the same way as its parents did. One may not and should not write on a blackboard with a white chalk while teaching this generation. Replacing the blackboard with a white one and the chalk with a marker doesn't change things, i.e. this is not the way to motivate students of today to gain knowledge and to develop skills for successful integration on the job market.

What needs to be done is adapt the education system to the digital generation by massive and effective applying of ICT-based innovative educational technologies and didactic models. Along with that, it is necessary to actively use the research approach to learning, which is aimed at developing students' skills in scientific research and at the formation and development of creative thinking and creative abilities based on IT competencies.

But we have to emphasize that information and communication technologies are not a panacea to all problems in the education system, rather they are just a tool which could make lectures and seminars more informative and more attractive to the digital generation. Educators will retain their key role in an interactive teaching process oriented to learners' needs.

Here we should also mention that the reputation of an educator and the effect of his/her activities will depend more and more not only on his/her level of mastery of the course content and on his/her pedagogic competence, but also on the extent to which he/she applies modern information and communication technologies for collecting, processing and delivering the specific teaching material.



In other words – the education in the digital era has to be redefined and the educational paradigm must be shifted, **BECAUSE LEARNERS DO NOT WANT TO STUDY THE TRADITIONAL WAY ANY MORE AND EDUCATORS SHOULD NOT KEEP ON TEACHING IN THE CONVENTIONAL WAY.**



PREREQUISITE

1. **2020 DIGITAL EDUCATION ACTION PLAN ADOPTED** by the European Commission.

2. The priorities of the Education, Audiovisual and Culture Executive Agency at the European Commission published in 2018, one of which is directed to the **“MODERNIZATION OF HIGHER EDUCATION THROUGH NEW EDUCATIONAL TECHNOLOGIES”**.

3. **“THE CONCEPT OF DEVELOPMENT OF THE HIGHER EDUCATION SYSTEM OF THE REPUBLIC OF UZBEKISTAN TILL 2030”**, Approved by Decree of the President of the Republic of Uzbekistan dated October 8, 2019 No. UP-5847.

GOAL

The goal of the concept is to adapt the education system to the digital generation by introducing and effectively implementing innovative educational technologies and didactic models in teaching, thus providing the opportunity for EVERYBODY to learn at ANY time and at ANY place with the help of ANY lecturer using ANY end device – computer, laptop, tablet, phablet, smart phone, etc.

OBJECTIVES

1. KEEPING AND GRANTING THE LEADING ROLE OF EDUCATORS THROUGH TAKING TARGETED ACTION TOWARDS:

1.1. Writing a Guide to Innovative Educational Technologies.

1.2. Publishing the Guide and disseminating it to all educators in:

- paper version;
- interactive multimedia version in internet.

1.3. Creating a publicly accessible virtual library of video lectures on the main topics of the Guide.

1.4. Creating a national network of centres for innovative educational technologies.

1.5. Development and implementation of the strategic plan “SMART-EDUCATION” in order to create a single information space for digital interaction within the university using flexible tools;

1.6. Submission to the authorized bodies of proposals for amending regulatory acts governing the activities of higher education organizations in terms of expanding the use of digital technologies in the organization of the educational process and providing information resources, training tools and the development of distance learning technologies, attracting creative students to digitalization projects of universities;



1.7. Creation of “Digital Competency Centers”, including structures equipped with high-performance digital equipment, classrooms, laboratories, media studios, etc., whose work experience will be transmitted to the entire higher education system of Uzbekistan;

1.8. Organising training courses for educators on the following topics:

- using interactive presentation systems;
- creating internet connected, interactive and multimedia presentations for lectures and seminars;
- implementing distance learning in real time by using:
 - interactive presentation systems;
 - video conferencing systems;
 - virtual classrooms;
- implementing distance learning at any time by using e-learning resources in:
 - text/graphic format;
 - video format;
- using cloud technology;
- using virtual reality;
- using augmented reality.
- using 3D printing for the development of didactic materials and experimental design samples;
 - digital didactics and digital learning models.
 - creating a scientific website for teachers and students to discuss projects, diplomas, term papers, etc.

2. DEVELOPING TRADITIONAL LEARNING:

2.1. Building a reliable and fast broadband wireless internet infrastructure within all universities.

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

2.3. Equipping classrooms with interactive tables as needed.

2.4. Providing educational software on various subjects and disciplines.

2.5. Training educators to create and use shared cloud resources in the teaching and learning process.

2.6. Equipping all classrooms with easily moveable and flexible furnishing articles that allow for quick transformation of the seating arrangements so that the learning environment becomes better suited to a digitally supported team and project work.

2.7. Using effective digital assessment tools and feedback systems during lectures.

2.8. Equipping the common areas of universities with interactive information screens (kiosks) which provide up-to-date information, incl. information for public, cultural, sporting and other events.



2.9. Using lecture capture software into classrooms. This software enables the University to capture course lectures including slides, audio, video, document camera activities, instructors' pens, and interactive whiteboards. Students can then access the recordings via the Internet, iPods and iPhones

2.10. The security system for authenticating users and personalizing their activities in networks to be arranged, built using electronic smart facilities .

3. DEVELOPING ELECTRONIC, MOBILE AND UBIQUITOUS LEARNING:

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

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

- text/graphic format;
- video format.

3.3. Creating virtual laboratories for the engineering courses.

3.4. Creating electronic interactive multimedia study materials.

3.5. Digitizing the library book fund and publishing it in the virtual library.

3.5 Creating a national fund of digital educational resources (electronic interactive multimedia learning materials, virtual simulators, etc.) for HEIs of the U.

3.6. Creation of a national fund of digital educational resources (electronic interactive multimedia educational materials, virtual simulators, etc.) for universities.

3.7. Developing and implementing online-learning in the MOOC format (massive open online courses) for students and faculty.

3.8. Electronic textbooks and tutorials that provide the basic capabilities for the digital generation are to form the basis of electronic educational resources, including those providing availability of interactive tests to check the material duly grasped, and intelligent tools to determine current and previously discovered gaps in knowledge.

4. DEVELOPING BLENDED LEARNING (traditional + e-learning) as the main mode of preparing specialists who possess the relevant skills required for successful functioning in the digital society.

4.1. Creation of specialized courses on the use of HiTech, based on andragogy.

4.2. Providing libraries with modern HiTech, widespread introduction of a system of electronic libraries with the ability to use them remotely, expanding opportunities for continuous professional development of students by organizing their use of the library stock and databases after graduation from higher educational institutions.

5. IMPLEMENTATING OTHER INNOVATIVE EDUCATIONAL TECHNOLOGIES:

5.1. Using smartphones in education and transforming them into virtual personal assistants of the students.



5.2. Using social networks in the teaching and learning process.

5.3. Organization of distance education programs based on modern information and communication technologies.

5.4. Implementation of the “E-MINBAR” platform with the possibility of online observation and mastering of lectures, workshops and seminars, as well as downloading them to electronic storage media, the use of "cloud technologies" in educational processes.

5.5. Gamification of the teaching and learning process.

5.6. "IoT" and "IoE" in the teaching and learning process.

5.7. Using robots in the teaching and learning process:

- as objects of control;
- as teacher’s assistants.

5.8. Using Artificial Intelligence in the teaching and learning process.

5.9. Creating conditions for giving universities the status of INNOVATIVE UNIVERSITY.

5.10. Creating a virtual university.

5.11. Creating conditions in which the educational process within the framework of e-learning and mobile learning to be provided through communications (‘teacher/instructor-student’), both in traditional forms of education, as well as through active networked interaction of students sharing knowledge and organizing collective work.

6. IMPLEMENTING INNOVATIVE EDUCATIONAL TECHNOLOGIES IN THE TEACHING OF STUDENTS WITH SPECIAL EDUCATIONAL NEEDS

6.1. Creating interactive educational tools for students with special educational needs.

6.2. Developing an e-learning platform for students with special educational needs.

6.3. Training educators for integrating specialized methods and tools for students with special educational needs.

7. IMPLEMENTING INNOVATIVE EDUCATIONAL TECHNOLOGIES TO ATTRACT STUDENTS FROM ALL OVER THE WORLD

7.1. The development of the use of modern software products in the educational process, widely used at the international level, based on the specifics of the areas and specialties of education.

7.2. Improving the methodological and technical qualities of MOOC;

7.3. Creating a web-site for research parks.

8. IMPLEMENTING INNOVATIVE DIDACTIC MODELS

8.1. Converting traditional didactic models into innovative models through the use of innovative educational technologies.



8.2. Individualization of educational processes based on digital technologies, development of distance learning services, widespread adoption of webinar technologies, online, “blended learning”, “flipped classroom” in practice.

9. INTEGRATING RESEARCH-BASED PRACTICES IN EDUCATION

9.1 Continuing and expanding university subscriptions for the use of world electronic educational resources, including electronic libraries, databases, laboratory work protocols, etc.

9.2 Implementing highest complexity digitalization tools such as digital analytics based on BigData technologies, Blockchain, Artificial Intelligence, Data Science in the educational process.

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

10.1 Developing digital education indexes, to provide reliable and valid measurement of implementation of digital transformations at higher education. The purpose of the index is to Ensure healthy competition between HEIs.

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

11. PROMOTING AND MULTIPLYING RESULTS AND GOOD PRACTICES through:

11.1. The media.

11.2. Regional and national workshops.

11.3. National and international conferences.

11.4. Social networks.

11.5. National network of centres for innovative educational technologies.

11.6 Hackfests

11.7 IT-club

11.8 Start-up projects

UNITS RESPONSIBLE FOR THE IMPLEMENTATION OF THE ACTION PLAN:

- rectors of universities;
- heads of structural units;
- deans of faculties;
- heads of departments.

FUNDING

- From projects under regional, national and international programmes;
- From donations;
- From the university budget.



ADDITION:

WHAT DO YOU NEED TO BE ABLE TO BEGIN THE DIGITAL TRANSFORMATION OF EDUCATION?

1. In the field of traditional learning:

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

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

- use videoconferencing;
- use virtual classroom.

3. In the field of asynchronous distance learning (at any time):

- create and publish in internet interactive multimedia study materials;
- record and publish in internet video-lectures;
- use cloud technology.

4. In the field of combined education, it is optimal to combine traditional and electronic forms of instruction for maximum effect.



GLOSSARY

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

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

Virtual room 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 - 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 - the application of game principles and mechanisms in the learning environment to increase motivation and involvement in the learning process.

The 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 - a technology for the purposeful, systematic and consistent implementation of original innovative methods, methods of pedagogical actions and means that encompass 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.

Mobile learning - a learning in which are used 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 themselves.



MOOC (mass open online courses) - a type of course that is fully offered online, is available to everyone 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.

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 work together to solve a problem for a while.

Endowment funds - the target capital of a non-profit organization.

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

Internet of everything (IoE) 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.

Flipped classroom is 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 work, usually done as homework, is performed in the classroom under the guidance of a teacher.