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Assessment of digital knowledge and research skills and overview of on going work at the national level, forecasting. Concepts of digitization

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Abstract. In the context of global digitalization, one of the most important conditions for a specialist's successful professional activity is having theoretical and applied skills of modern digital technologies. Digital skills not only include theoretical knowledge of digital technologies, but also guarantee their successful application. Special skills for the effective use of this knowledge - understanding the digital environment, rapid adaptation of individuals to an unfamiliar environment, being able to effectively use special technology, hardware and software in all sectors of activity, and understanding the digital environment, etc. is required. Digital literacy encompasses the personal, technical and intellectual skills needed to survive in a digital world. Digital knowledge and skills should represent aspects of each individual's professional activity, as well as the ability to perform in a specific job position and at a specific time. Competencies are characterized as dynamic concepts related to a certain context and ecosystem of professional activity, and the expert of any field of activity has a certain pace of development throughout his career and acquires certain professional abilities based on basic skills (for example, fundamental or instrumental). It is desirable that this system includes the ability of mobility, which requires continuous renewal and development throughout conscious life. Calling these qualities "operational skills" is a more correct approach. The impact of digital literacy on the acquisition of other important life habits of a citizen of the information society is undeniable. Each individual should be able to accept and use the opportunities that technology gives us. Digitization already exists as a phenomenon that requires thinking about the past, present and future at the same time. This phenomenon requires more flexible adaptation to new conditions and changes. Because technology is changing very fast. But changing habits is quite difficult. Digital development requires developing and managing many different elements (people, processes and technology) together. The ability to choose the right tools to achieve optimal learning outcomes and problem solving in each specific situation is an important component of digital knowledge and skills. The presence (or lack) of digital competences directly affects the quality of existing processes, creating the need to teach digital literacy to all individuals.

Keywords. Digitization ,Concepts of digitization, cognitive skills , digital knowledge, targets of digital knowledge, "Digital Maturity Model for Citizens",Target Competency Model -2025

Introduction

As we know, it is possible to have a more practical and productive result if skills and habits are formed and developed in various applications of knowledge. In this process, the

dialectic unity of knowledge, skills and habits acts as an important factor in ensuring optimality and conditioning development. .

Skills are more related to job position, workplace. One is irrelevant without the other. Taking into account the high dynamics of the development of digital activity, we can say that these skills are of vital importance. The interdisciplinary nature of skills, that is, the content or semantic load of skills, can span several different subject areas. The need for constant updating of digital skills is a result of the rapid development of technological equipment and information systems. As a rule, competitiveness factors of mobility and skills to be combined in the virtual space to solve common problems across administrative and international borders exist and develop with an increasing trend. The role of international standards, in which a comprehensive system is formed by the world community, which provides products and processes with "openness" features, is growing and forms the unique laws of information technology. Continuing education with new technology for individuals has become a very important, urgent process these days. There is no doubt that in today's era, every professional needs to adapt to current technology trends and increase their "adaptation to change" skills. A qualified individual must seek opportunities for professional development, be self-motivated, and understand the importance of knowledge about new technologies, which includes attending conferences, online courses, and professional forums.

The purpose of the research

The main purpose of the study is to define and compare the main categories and targets of digital knowledge and skills.

Discussion of the issue

The development of digital knowledge and skills at a high level is carried out in the following stages:

- analysis of interstate practices for the application of digital skills, discussions, reports
- measuring and predicting gaps in the application of digital skills;
- development and data collection through a questionnaire on currently used practices

There are quite serious sources of information about the role of efficient and professional use of digital technologies in modern society. Today, acquiring digital skills is important for all members of society. Currently, there is a trend of rapid progress towards digitalization in various fields of activity all over the world. People are aware that they are ready for the demands of the new digital age.

Digital literacy is the sum of social, emotional and cognitive skills needed to ensure the resilience of people in the digital world and to quickly adapt to digitalization. Digital literacy requires individuals to have the following skills: 1. To be able to use technologies more efficiently;

2. Be able to manage an application or website;
3. High-level implementation of digitization in work processes

The skills of specialists are grouped according to the level of use of Information Technologies (IT):

1. General IT skills that allow specialists to use IT in their daily work.
2. IT professional skills required by specialists to apply in the production of ICT products, services and resources.
3. Problem-based digital skills - skills of specialists who develop and use specialized problem-oriented platforms, applications, software packages.

4. Applied IT skills – skills of using the capabilities of the ecosystem to perform specific tasks related to practical IT use: using digital social services. networks for digital communication with colleagues and customers, brand promotion of products on e-commerce platforms, big data analysis, business planning, etc.

Thus, Digital competence refers to the use of digital devices based on ingrained, automated behavior patterns, the ability to acquire new information about digital transformations, knowledge and skills, and to be able to use applications and networks to manage them.

Digitization initiatives are developing faster as time goes by. Many countries have established national digitization programs and this process will continue as agreed by the International Federation of Library Associations (IFLA) summit.

As stated in the "Azerbaijan - 2020: vision of the future" development concept adopted in our country, the main task ahead is to achieve the preventive development of the non-oil sector, increase the efficiency and competitiveness of the economy, and ensure its innovation-based progress. [1] For many years, the foundations of the transition from the traditional economy to the digitalized economy have been laid, and the adequate development of human capital, which is a decisive factor for this, has been brought to the fore. This, along with giving appropriate requirements for the formation of a new model of new social-economic, material-spiritual resources, fundamentally changing the system of education, culture, information provision, innovative processes in the direction of information processing and delivery to users, as well as the role of ICT and virtual education, computer-network knowledge - has led to an increase in the day. At the same time, digitization processes of library-information centers and archives in our country continue in a purposeful manner.

IFLA's "Guidelines for planning digitization of rare works and manuscripts" prepared by IFLA in September 2014 can be considered as one of the most important documents on digital fund creation technology. [2] According to the guidelines, projects should be carefully planned; goals and objectives, copyright restrictions, funding sources, and institutional mandates should be considered. Projects should involve collaboration between librarians, technologists, preservationists, researchers, and managers.

IFLA's "Strategy for Global Libraries 2019-2024" is a very important document and a valuable reference point for libraries. [3] This strategy recommended the following main directions.

1. Strengthening calls for the creation of global libraries
2. Dissemination and motivation of professional experience
3. Combine and strengthen fields
4. Optimization of organizations

Increasing the role of libraries in achieving the Sustainable Development Goals, creating a strong level of participation in international organizations and conferences as a valued partner, working with library associations and libraries to identify and promote action on the main legal and financial challenges faced in their work, including intellectual freedom and human rights. Shaping public opinion and debate around access and library values are central to this strategy.

To produce, link and share key resources and materials that motivate the digitization process, to engage and energize libraries on a regular basis Providing high-quality campaigns, information and other communication products is one of the main issues envisaged in the strategy.

In its report (2017), the European Union devoted a special place to the "Digital Competency Model for Citizens". [4]This concept reflects the qualities that individuals with digital knowledge and competence should be able to:

1. Information literacy
2. Communication and cooperation
3. Creation of digital content
4. Safety
5. Problem solving
 - 1.1 Environment for reviewing, searching and filtering digital data, content, shaping information needs, searching for digital data, accessing content
 - 1.2 Evaluating information, data and digital content, analyzing, comparing and critically evaluating reliability, data sources, reliability of digital content, analyzing and interpreting data
 - 1.3 Digital content management, processing, storing and using data, information and content, organizing these processes in a structured way
 - 2.1 Digital interaction, interacting through various digital technologies, defining appropriate digital communication
 - 2.2 Digital exchange, sharing data, information and digital content with others, being able to use appropriate digital technological tools as intermediaries for the exchange
 - 2.3 Providing citizens' participation in the life of society through digital technologies, private digital services.
 - 2.4 Using digital tools and technologies to digitally collaborate, co-produce resources and knowledge
 - 2.5 Online etiquette, having a trademark, knowing the rules and norms of behavior during digital use, understanding and developing cultural and generational diversity in the digital environment.
 - 2.6 To be able to manage one's digital identity, to be able to create and manage one or more digital identities, to be able to protect one's reputation and digital identity.
 - 3.1 Creation and editing of digital content in different formats.
 - 3.2 Integrating and processing digital content, changing and improving the quality of information and content, incorporating them into a single dataset to create new information
 - 3.3 Understanding copyrights and licenses and how they are used
 - 3.4 Programming, planning and developing clear and consistent commands, performing specific tasks for computing systems
 - 4.1 Protecting devices and digital content, understanding the risks and information about threats and security measures in the digital environment
 - 4.2 Ensuring the protection and privacy of personal data in the digital environment, understanding how personal data will be used, maneuvers to prevent harm
 - 4.3 Protecting health and well-being, avoiding physical and psychological health risks and threats, health while using digital technologies, protecting oneself and others from potential dangers in the digital environment, being aware of digital technologies for social well-being.
 - 4.4 To be aware of the effects of digital technologies on the environment, to protect the environment and ecology
 - 5.1 Solving technical problems, being able to identify and solve technical problems that occur in digital devices during work
 - 5.2 Identifying needs and finding technological solutions, choosing the required digital tools, personalizing digital environments for the person

5.3 Creative use of digital technologies, using digital tools and technology to create knowledge,

tracking research and innovations, developing conceptual solutions to problems, a way out of problematic situations in the digital environment.

5.4 Identify digital skills gaps and understand the need to develop them, support others in developing their own digital skills, seek opportunities for self-development in the digital environment

Boston Consulting Group (BCG) is a company that operates in all areas and regions of the world's social activities, and whose partners are private, public and non-profit organizations. As an international company specializing in management consulting, a leading business strategy consultant, BCG's "Target Competency Model -2025" is a brilliant approach.

3. Target Competency Model -2025

"Target Competency Model - 2025" emphasizes the importance of taking into account the adequacy of computer literacy and complex collaboration and communication skills in the digital environment. [5]

In addition to purely technical skills such as working in a digital environment, this model includes cognitive and social-behavioral skills with devices. Effective communication and personal development in the digital environment, the following main directions can be identified to develop these competencies:

1. Digital skills and knowledge (basic digital literacy, data analytics, machine learning, artificial intelligence, programming, IT systems architecture, cyber security);

2. Skills and knowledge that help to cope with change, certainty of the future. For example, adaptability, critical and systematic thinking, ability to cope with stress, change management, work planning, ability to work on oneself according to the concept of "lifelong learning";

3. Skills and knowledge that help to cope with a large flow of information, basic programming skills, search, information analysis and processing, information culture, media literacy, as well as careful management;

4. Skills and knowledge that determine high communication skills, effective interpersonal interaction, mental teamwork, cooperation, self-presentation skills, business negotiations;

5. Skills and knowledge that machines cannot master, political and emotional intelligence, creativity and thinking outside the box, robotic process control

The "International Museum and Library Services" act, adopted in 2010, states that "Digital skills are a set of processes that include both cognitive and practical skills to find, evaluate, create and communicate information to the user." [6]

Digital skills have the following cognitive elements:

- civility - is a cultural attitude to the values and thoughts and agreements formed in the digital environment created by the interaction of technology, internet and users.

- cognition- (cognitive perception) - multidirectional attention, fast information processing, developed visual and auditory memory

- constructiveness - improved and quality service, determination of uniqueness

- sociability - is the formation and acceptance by individuals of the traditions of socialization in the digital environment (the process of adapting to others, which society considers acceptable).

- confidentiality - is the process of limiting illegal or unauthorized access to information for the purpose of confidentiality and reliability, security.

- creativity is the ability to produce new, innovative ideas, to create effective methods and methods of the activity process.

- critical approach - to overturn the dominant (ruling) social and cultural concepts (people, works, information, etc.), find and show their missing aspects.

- digital citizenship – responsible, quality, creative and dignified participation in digital platforms, the ability to respect human rights.

With the implementation of a system based on the "World Spider Web" chain, service processes will be more accessible and institutions will be more responsible, and the process will be smarter as a result of the use of artificial intelligence, intelligence. Big data can lead to more flexible and accurate policy strategies and programs. The analysis of digital changes in personnel management predicts that the need for human resources will settle at a decreasing level in the developing digitization. Currently, 45% of the world's population has access to the Internet. [7]

In the near future, access to the Internet and information in a systematic form will become one of the fundamental rights not only for developed countries, but for the entire world's population. Thus, in the coming years, three quarters of the world's population will have continuous access to the Internet it is predicted that he will get opportunities. The processes of creating various contents will become easier compared to the past. The miniaturization of technological tools and devices, the increase of computing power, as well as the lowering of market prices will lead to an increase in the use of mobile and smart phones by more people. At the same time, we must note that these processes are both positive, both have negative effects.

Positive effects:

- Increase in the level of participation of the population in economic processes in areas located at a long distance and with a low level of development;
- Access to education, all types of information services, as well as other public services;
- Digital presence;
- Opening new opportunities in the field of employment and career;
- Reaching the peak of digital trade development;
- Larger amount of information;
- Higher skilled users;
- Reaching a high level of democratization processes;
- Increased transparency.

Adverse effects:

- Increasing cases of manipulation;
- Political fragmentation;
- Barriers limiting access to the Internet.

As a result of the continuous development of computing technologies and the lowering of software prices, it will be possible to connect every object to the Internet. As a result of the ability of all objects to be connected to a smart and digital system, it will result in the emergence of new service areas based on analytical skills. All these processes will ensure the efficient use

of resources and raise the standard of living by increasing productivity. In addition, increasing complexity will lead to the weakening of control processes, which will lead to an increase in hacker attacks and security threats.

Nowadays, there is a large amount of data, and the difficulties of managing these databases are increasing rapidly. From databases, information services can be provided to users in newer and more innovative ways.

The risks and opportunities of using large-scale databases in automated decision-making processes are vast.

At the same time, the issue of trusting data and algorithms will be crucial. Individuals' privacy concerns will lead to the creation of a legal accountability system.

In the coming years, it is planned to complete the process of forming a national innovation system that ensures the use, assimilation and dissemination of new knowledge and technologies in accordance with the requirements of the transition from the information society to the digital society in Azerbaijan using advanced world experience. [8]

Ensuring a faster transition from the information society to the digital society, building a knowledge-based economy with the development of ICT, expanding the application of ICT in state and local self-government bodies and developing electronic services, fully satisfying the society's demand for information products and services, competitive and export-oriented Strengthening the potential of ITK is one of the priority tasks ahead.

All this increases the demand for the training of highly qualified specialists in each field for our country. This, in turn, reveals the need to establish the directions of reforms in the field of specialist training in accordance with the development trends in the world.

The rapid development of digital technologies and IT fields is leading to automation, creating production processes that lead to the disappearance of some professions, and this is predicted to accelerate.

In the near future, many professions that are in demand now will lose their relevance, the number of jobs will decrease, and this in turn threatens the citizens of the digital world with an increase in unemployment. Most of the individuals will not have the necessary skills to work in reality.

The 21st century is a period of active development of digital technologies and communication technologies, characterized by the Internet, IT field and all digitalization and automation. The physical world is increasingly rapidly merging with the virtual world, and it is inevitable that the digital world, or the so-called "hybrid world" in the near future. The present world is changing its structure what is generated by the emergence of cyberspace in which there are more and more human activities. Virtual setting has new mechanisms, modes and principles of functioning what makes it different from real space. [9] Digital transformation is accelerating, and production and management, service processes are automated. Many functions have already been completely transferred to the "hands" of devices and robots. If a large number of professions disappear, of course, new professions will also be created, and these professions will create new requirements for the worker. The need for personnel with the necessary competencies will increase with growth.

The COVID-19 crisis has clearly demonstrated the importance of digital skills. According to an EU survey (2020), 1 in 5 young people lack even basic digital skills. Only 39 percent of teachers in the EU feel ready to use digital technologies in their daily work. 62 percent of respondents felt they improved their digital skills during the crisis because they were forced to work, learn and live online. [10]

A similar situation is observed in Azerbaijan. According to statistical analysis, approximately 53 percent of the country's population can be considered digitally literate. These numbers are close to the indicators of developed countries compared to world statistics. However, the remaining significant part of the population in our country does not have the necessary skills to take advantage of the technologies.

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