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Critical Thinking and the Digital Age

Activities in the field of information and communication technologies are expanding all over the continent, and humanity is increasingly using digital technologies to solve problems, especially those generated by the COVID-19 pandemic in recent years. The pandemic, despite the economic and social upheavals it has caused, has given new chances and opportunities for innovation and digital transformation. For millions of people, digital technologies were of vital importance during the pandemic, solving a variety of problems, ranging from remote work to online classes for children and online home shopping.

In the Address of the Head of State Kassym-Jomart Tokayev to the People of Kazakhstan dated September 1, 2020 "Kazakhstan in a new reality: Time for action" declares "Digitalization is not following a fashion trend, but a key tool for achieving national competitiveness. First of all, it is necessary to eliminate digital inequality, ensure maximum access to the Internet and high-quality communications for all citizens. Today it is the same basic need as roads and electricity"[1]. New digital services based on data, such as artificial intelligence, next-generation 5G networks, the Internet of Things and computing using quantum computers, have opened the way to new needs that can transform all spheres of human activity and affect the economy of the state. The latest generation of high-speed Internet satellites is able to change the lives of billions of people in the coming years. However, these technologies will not bring success on their own. Without basic digital skills training, people can only partially enjoy the benefits of Internet connectivity. The rapid development of artificial intelligence, augmented and virtual reality, gamification, distributed registry systems, cloud knowledge bases, smart interaction systems and a number of other digital transformations requires future specialists to develop digital skills and knowledge, manage smart machines and algorithms. This will require clear regulation in the education system, digital skills training programs and changes in the way of

thinking. "New technologies are changing rapidly and require comprehensive knowledge, skills and competencies, including personal and interpersonal skills and responsibility for planning work processes, including their quality. Lifelong learning represents a new perspective on improving people's knowledge, skills and competencies throughout their lives" [2].

Due to the rapidly changing mass flow of various information, today's modern specialist requires the ability to independently extract the necessary and high-quality information, the ability to transfer this mastered knowledge and skills to new areas, to new situations, the ability to solve complex complex tasks, which every year includes completely new approaches and skills. "In the modern education system, we must promote the development of the competencies of the future, the so-called skills of the XXI century, that is, critical thinking, teamwork, creativity and skills for obtaining new knowledge. It is these communication skills that are needed, while purely technical skills (for example, memorizing facts, counting) will be taken over by machines to some extent in the future... The process of traditional contact teaching was created mainly on the basis of the teacher's activity and the teaching process, while in the process of digital education, the starting point is the learning process of the student himself" [3].

Critical thinking plays a huge role in the era of digital development, lifelong learning – one of the most necessary skills of the XXI century. "Critical thinking skills are not limited to the study of information. They are part of metacognition — a higher-order thought process that allows you to adapt and continuously learn throughout your life" [4]. The concept of critical thinking has been studied by many scientists (P.Blonsky, V.Bolotov, V.N.Bryushinkin, V.Skornyak, T.Khachumyan, V.Teplov, O.Ivanova, N.Yulina, A.V. Fedorov, D.Halpern, G.Follmer, K.Popper, R.U.Paul, S.Plaus, V.R.Ruggiero and others). Thus, A.V. Fedorov writes that "critical thinking is a sequence of mental actions aimed at checking statements or systems of statements in order to clarify their inconsistency with accepted facts, norms or values" [5, p.53]. D.Halpern defines critical thinking in his work "Psychology of critical thinking" as follows: it is "directed thinking, it is characterized by balance,

logic and purposefulness, it is distinguished by the use of such cognitive skills and strategies that increase the likelihood of obtaining the desired result" [6]. S.I.Zair-Bek in his work "The development of critical thinking in the classroom" writes that "critical thinking teaches to act actively and helps to understand how to act in accordance with the information received" [7, p.5].

Innovations in the field of digital technologies such as storage and processing of large amounts of digital data, machine learning, cloud and biometric technologies are based on the basic ability to critically and purposefully work with information, the ability to identify the necessary sources, verify it, and process large amounts of data. With the help of modern analytical tools, it solves the problems that almost any specialist in the field of his field is facing today. In order to find out, a survey was conducted among the students of the city's colleges, how the student uses the modern information and digital space, thereby gaining access to relevant knowledge and technologies that are in demand in their future profession.

When asked which sources of information do you use and are significant to you, 78% of the 300 respondents use information from social networks, Internet sites, and for 22% of respondents are books, magazines, novelties of literature and other sources. It follows that information and communication tools are widely used as a source of information. Which way of working do you think is the optimal solution when processing information 70% of respondents consider finding, thoughtfully reading, collecting, analyzing, making notes and collecting collections on topics, researching and transmitting information to be correct, the remaining 30% of respondents answered that information processing is to look quickly, instantly cut off excess information, keep information in mind, etc. The analysis of the data obtained on these issues indicates that digital technologies have firmly entered the life of a modern student, to find and compare the information received, to distinguish facts, to give analyzed arguments corresponding to the set goal, speak about the process of forming critical thinking skills. The concept of "critical thinking" is understood by almost 50% of respondents themselves as observation and the ability to justify their point of view, focus on studying information and the ability to apply analytical skills

in a variety of situations, 30% of participants believe it is the ability to choose the most optimal among a variety of solutions, to refute the false in a reasoned manner, and 20% chose the answer that is organized in complex cases, persistent in the search for information, rational in the selection of criteria, focused on research and persistent in the search for results. When asked why a modern person should possess "critical thinking skills", 77% of survey participants believe that thinking critically means learning to carefully and clearly assess the consequences of their decisions, correctly formulate tasks and ways to implement them, becomes open to new information and calmer when faced with something unknown, is also important for achieving success in career growth, in everyday life, the remaining 23% chose that thinking skills allow a person to consciously form a holistic picture of the world, improves the quality of perception of the material, helps to optimize the process, etc. The results obtained on these questions are extremely important, as they demonstrate the ability of students to self-reflection, self-assessment of the formation of their existing skills, i.e. the level of reflexivity and flexibility of critical and analytical thinking based on their worldviews.

In the course of the research, it became clear that students understand and realize the need and peculiarities of working with digital sources of information, the benefits of the ability to analyze facts, defend their point of view in a reasoned manner, understand and evaluate their positions in a variety of situations, using critical thinking skills, you can get real practical results, both in the field of future professional activity and in everyday life. The development of a future specialist is determined nowadays not by the amount of knowledge, information held in memory, an ever-increasing amount of scientific information, but by a person's willingness to select the necessary knowledge through critical analysis, comprehension of information and the ability to make decisions independently.

In the current decade, we will witness the acceleration of digitalization, the complication of related problems and the constant change of digital resources, and in this rapidly changing world, a high level of training is required from specialists of all skill levels: digital and mathematical literacy, critical and analytical thinking, the

ability to make quick and correct decisions in a given situation. Critical thinking, recognized as one of the skills of the 21st century, will ensure the formation of general and professional competencies of the future specialist.

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