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Modern Information and Educational Environment in the Context of the Theory of Generations

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Abstract:

The article analyzes the image of the modern informational and educational environment, taking into account the participation of different generations. The works of modern scientists and practitioners who investigate various aspects related to the impact of information and communication technologies on the current generation of pupils and students are analyzed. Studies analyzing the overall statistics on the use of information and communication technologies (hereafter ICT) up to the impact of these technologies on the human brain and the creation of new learning strategies are taken into account. The authors analyzed Generation Z in detail, providing the characteristics of the generation that is now being studied, by researchers from different countries. The comparative table shows the positive and negative qualities of representatives of Generation Z.

Research analysis shows that the psychological readiness of both students and teachers to use information and communication technologies effectively should be taken into account when planning collaborative work in an information and education environment. Distance learning, which is increasingly used in higher education institutions, entails the need for careful analysis of how to create educational material and how to organize work with students. Accordingly, teachers are expected to take different approaches to teaching Generation Z students. Modern students expect an individual approach to learning. It is important to know where you can find relevant information and how to apply it in practice. At the same time, the article emphasizes that during the distance education of students, the role of the teacher in the didactic process is even more significant than in traditional education.

Based on the analyzed sources, the article concludes that the urgent need of today is to create a new model of information and educational environment, which, taking into account changes in society and in the minds of students, will allow the qualitative use of the creative potential of information and communication technologies, without giving up other forms of knowledge acquisition and competence formation.

1. Introduction

1.1. Statement of the problem

Socio-political and socio-economic processes over the past few years have dramatically affected all spheres of life. A series of technological breakthroughs in all important fields of human activity makes it possible to consider from a new angle the trends in the organization of the modern educational environment.

The rapid development of information and communication technologies has led to the emergence of a new generation of pupils/students who have specific abilities and skills for working with modern digital devices. They easily master new gadgets, video games, various programs, and digital media. They are called Generation Z, digital natives, or digital tribes (Prensky, 2001). At the same time, among the participants of the educational process, you can meet representatives of other generations: X and Y are mainly teachers and lecturers, Z are students, and Alpha are students. Given this, there is a need to rethink approaches to the organization of the educational process in the context of the theory of generations.

1.2. Analysis of recent research and publications

The theory of generations was developed by American scientists Straus and Hove (1991) and presented in the book "Generation: The History of America's Future, 1584 to 2069". The basis of the theory is the idea that each generation (people born between the ages of 20 and 22) is characterized by common values, beliefs, and patterns of behavior. Generations with shared values change cyclically about every 80 years.

Currently, the population of the Earth is represented by the following generations:

— The Greatest Generation, born in 1901-1924;
— Silent Generation, 1925-1945;
— the generation of Baby Boomers (Baby Boom Generation), 1946-1964;
— Generation X, Unknown Generation (Generation X), 1965-1979;
— generation Y, millennials (Generation Y), 1980-1994;
— generation Z (Generation Z), 1995-2009;
— generation Alpha (Generation Alpha), 2010 – 2024 (McCrindle, 2014).

According to forecasts in the professional market, the share of the Silent Generation, which is already very small, will decrease to zero by 2023, and representatives of the Baby Boomer generation (20% of the labor market) will make up the largest share of those retiring: approximately 10 thousand persons every day out of 44 million working Baby Boomers. (Deloitte LLP, 2018, pp. 7-8, 14). Meanwhile, by 2025, Generation Z, now numbering over 2 billion, will account for almost a third of the global labor market (McCrindle & Fell, 2021). This situation forces employers to be more responsive to the needs of the younger generation, to consider their lifestyles, work, and study habits, and consequently to make new demands on the design of current information and education environments.

Modern scientists and practitioners investigate various aspects related to the impact of information and communication technologies on the current generation of pupils and students – from general statistics of ICT use to the impact of these technologies on the human brain and the creation of a new learning strategy.

The works of such scientists as Lewiński (2010), and Wroczyńska (2013) highlight the results of research on the expectations of modern students from studying at a higher education institution and from the teachers themselves. Batorski (2010, 2013), Bartoszewicz and Gulińska (2013, pp. 44–49), Lubina (2009, pp. 35–39), Tanaś and Galanciak (2015), Penkowska (2010), etc. analyze the problems associated with the introduction of new learning technologies in institutions of higher education.

The subject of research by many scientists is the readiness of teachers/lecturers to teach today's young generation (Brzezińska, Hornowska, Kaliszewska-Czeremska, Matejczuk, 2012; Kaliszewska-Czeremska, Laconi, 2015; Tomaszewska-Lipiec, 2018; Tomaszewska, 2020; Pogorzelska, 2020; Kargul, 2020).

Children born in the digital age are naturally attuned to multitasking. Because of this, Ledzińska and Czerniawska (2011), Chomczyński (2015), Mokwa-Tarnowska (2014) believe that the organization of the educational environment needs an interdisciplinary, integrated approach taking into account the achievements of related industries.

2. RESEARCH RESULTS

2.1. General characteristics of Generation Z

The defining feature of Generation Z is that they were born in the digital age, are used to instant access to information, and "live" in a digital environment. The results of sociological surveys indicate that 74% of young people spend their free time online; 55% use smartphones more than 5 hours a day, 26% – more than 10 hours a day; 75% use a smartphone more than a computer or laptop; 95% use a smartphone or other digital device while watching TV; 66% have multiple internet-connected devices (Morgan, 2020). Americans aged 18 and older use various electronic devices (computers, tablets, smartphones, TVs, game consoles, etc.) to interact with the digital space for more than 11 hours on average. per day (Nielsen Company, 2018). According to a study by the Kyiv Institute of Sociological Research, approximately 82% of respondents in Ukraine use the Internet at least once a week, 78% of them every day or almost every day. The urban population uses the Internet more often than the rural population. As age increases, the percentage of active Internet users decreases. The higher the education of a Ukrainian, the more often he uses the Internet. It is reported that Ukrainians aged 70+ (27%) use the Internet least often, and Ukrainians aged 18 to 49 use the Internet most often (Cheryomukhina, 2022).

Researchers identify the following psychological traits characteristic of representatives of Generation Z: pragmatism, independence, ambition, determination, focus on the future, individualism, creativity, inquisitiveness, impartiality, tolerance, sensitivity, multitasking, the ability to quickly switch attention, the desire for constant learning and obtaining new knowledge and impressions. They are independent in everyday life, frugal, experienced, and conscious consumers, have entrepreneurial qualities, value originality and openness, are socially active, have difficulty making decisions, try to avoid risks, prefer dialogue over confrontation, seek self-affirmation and stability, can work effectively with information and quickly adapt to new technologies, want to enjoy the working and educational environment, have the opportunity for professional and personal growth (Bondarenko, 2018, pp. 86-87; Soychuk, 2016, p. 223; Blumenfeld, 2019; Crous, 2019; Francis & Hoefel, 2018; KMPG, 2018).

Ernst & Young (2020) call Generation Z "the Generation of contradictions" and distinguishes five psychological types of its representatives depending on their goals, motivations, and priorities: intense seekers (35% of all representatives of Generation Z), authentic activists (16%), dreamers – big plans, too little effort (18%), closed perfectionists (15%), carefree (16%). The given characteristics make it possible to conclude that at least two-thirds of the representatives of Generation Z are focused on achieving professional success in the future, and are ready to make efforts, learn and improve themselves (Goretko, 2022).

Deloitte analysts (2018, pp. 11-15) confirm these statistics. According to their data, in general, representatives of Generation Z do not call into question the importance of formal education – on the contrary, the younger generation takes obtaining a bachelor's degree more seriously than the previous ones. At the same time, they prefer an independent learning style, and advanced digital skills allow them to widely use a variety of online educational platforms.

Experts from the Pew Research Center believe that Generation Z may become the most educated generation in history. One factor that can explain this trend is that Generation Z is growing up in a more educated environment: their parents are better educated than the parents of previous generations. 44% of Gen Z parents have at least one parent with a bachelor's degree or higher, compared to 33% of millennial parents (Parker & Igielnik, 2020). The same positive attitude to education among members of Generation Z who are already working (in 2021, the oldest of them will be 24-26 years old). According to the results of sociological surveys, three-quarters (76%) of representatives of this category feel that the skills and abilities needed today will be different tomorrow. Two-thirds of respondents (62%) say that the professional skills required by employers are changing very quickly, and that is why modern technical skills are more important than social skills in the labor market. 59% believe that their profession will change significantly in the next 20 years, and that is why they are eager to learn. At the same time, for the majority (62%), the goal of education is not to get a promotion, but to achieve greater professional success. Also, about half of the respondents want to be able to devote their time to further education (Poague, 2018).

2.2. Analysis of educational opportunities for generation Z

Recently, there has been an increase in the interest of scientists from various fields and fields (neurophysiologists, psychiatrists, neuropsychologists, and neurocognitive psychologists) in the results of the brain research of Generation Z using modern methods of neuroimaging, functional magnetic resonance imaging, and computer tomography (Bauer, 2015; Bauerlein, 2009; Kirschner & Bruyckere, 2017; Carr, 2008; Spitzer, 2012; 2013; Small & Vorgan 2008; Hüther & Hauser, 2014; Sikorski, 2015), Żylińska 2013; Chorab, 2016). Their works show the changes that have taken place in the brain of the modern generation under the influence of contact with new technologies during the last two decades. Now we see that these incomparable changes have a much bigger and deeper range than we could have imagined.

Tapscott (2008) outlines several positive qualities of representatives of this generation. In particular, they can instantly find the necessary information, "sift and sort" it, evaluate and transform it into knowledge, video games have improved their hand-eye coordination, and their consciousness has become "sharper" in the perception of visual objects and orientation in space.

At the same time, in the studies of other scientists, it is noted that most representatives of Generation Z are only passive consumers of mass media, they do not possess any extraordinary abilities in modern technologies. They use Internet technologies in huge amounts, but mainly for entertainment, communication with friends, and contacts with the world. That is, most of them are ordinary consumers, not creators of Internet content (Kirschner & Bruyckere 2017). Regarding learning, they use these technologies quite passively: reading information from Wikipedia or downloading files with the content of lectures (Bullen et al., 2008, p. 5).

The results of the report of the European Union *EU Kids Online* agree with this, that only about a quarter of the respondents used websites that allow creating files or writing blogs. Most of the interviewees used ready-made content on the Internet (Livingstone et al., 2011).

Noting the phenomenon of medial multitasking, which the new generation possesses, the researchers characterize its positive and negative sides. On the one hand, representatives of Generation Z can perform many tasks at the same time (Spitzer, 2012), on the other hand, this leads to more superficial and less efficient processing of information. Sikorski (2015) confirms that deep mental work, which is the main condition of learning, has been replaced by digital gliding on the surface, and surfing and browsing are shallow processes that leave little information in the brain.

M. Bauerlein (Bauerlein, 2009), the author of the book "The Dumbest Generation: How the Electronic Age is Creating a Generation of Stupid Americans and Endangering Our Future," using the example of American youth, claims that, despite all the opportunities that the network has provided the young generation, in terms of obtaining information, young people have not become more educated. Moreover, young people read less and write worse, their minds abandon the cultural heritage of the whole world, and they are engaged in copying (borrowing) texts, pictures, videos, etc.

Żylińska (2013) draws attention to the fact that excessive use of digital technologies in information processing leads to digital dementia. As a result of long-term overload with digital technologies and mass media, technological brain burnout occurs. As a result, the overload of tasks and information caused by a constant Internet connection makes it impossible to analyze information and develop appropriate behavior.

Psychologists have documented an increase in depressive symptoms among teenagers and young adults from Internet use and dependence on digital media. Essentially, they are based on the unpredictability of events when interacting with others on various sites, leading not only to addiction to these media, and a constant online presence but also to a loss of self-control. Due to the lack of self-control, the consequences of addiction are much more dramatic (Spitzer, 2013).

A generalization of the positive and negative qualities of representatives of Generation Z is given in Table 1.

Table 1. Positive and negative qualities of representatives of Generation Z

Positive qualities	Negative qualities
— they expect and demand freedom, choice, and diversity in all spheres of their lives; — unlike previous generations, who are used to consuming mass products, they prefer an individual style not only in consumption but also in the organization of their workplaces; — acting in the conditions of the existence of a huge number of media channels, they learned to control information, instantly recognizing hoaxes and lies; — they expect honesty from everyone, they can forgive mistakes, but not deception; — cooperation, which often goes beyond joint work and general social actions and takes the form of co-creation, is their natural state; — entertainment is so important and necessary for them that they always want to have fun while working and do not see clear boundaries between work and play; — having high-speed computer technologies, they expect only quick answers, decisions, and actions; the absence of such makes them bored, restless, and irritable; — being in a continuous stream of technological changes, they want to have the newest technical «toys».	— they are unable to concentrate, suffering from attention deficit disorder; — cannot communicate in the real world; — have a network dependency, — spend time online instead of playing sports, — avoid personal communication, — have health problems; — their passion for video games can be compared to alcohol and drug addiction; — they are socially immature, unable to live independently – they live with their parents; — do not respect copyrights and violate them; — are used to insulting others online with impunity; — they have weak motivation; — they do not know how to set goals; — are not «excellent» employees (do not want to obey strict rules of behavior in the office); — suffer from egoism and narcissism: — social media and YouTube make them feel at the center of attention.

Source: *Shtepura (2021)*

We agree with D. Tepscott's view that the online generation is not "lost" but also has no "fatal flaws" and is making the world a better place. We like this position, we support the opinion that traditional education does not suit them. Since they can access information instantly online, and the amount of knowledge becomes outdated extremely quickly in any profession, modern education should not be directed at imparting knowledge, but at how to learn, analyze, and process information.

2.3. Organization of the educational process taking into account the needs of Generation Z

As practice shows, for understanding to be possible, teachers must first understand the language used by generation Z. Teachers need to find contact with them to continue working together. M. Prensky recommends using the communication and learning style typical of digital natives in classes, although this does not mean that it should be the only or dominant one. In his opinion, it is necessary to adapt the material to the language of digital natives, otherwise, the gap between the two generations will deepen (Prensky, 2001).

The advice of Żylińska (2012) and Postoła (2017), is noteworthy, highlighting the importance of familiarizing oneself with the results of recent neuroscientific research. Without detailed knowledge of how Gen Z brains function, it will be difficult for a teacher to teach them. Knowing the way the brain functions should not mean the definitive acceptance of all the methods favored by digital natives. Some of them are still not as effective as those used by older generations. However, teachers who know how the brain works will have an easier time anticipating possible problems and difficulties that students may encounter during their studies. Without it, it is not only difficult to choose the right tools and plan classes, but it's also difficult to communicate.

In this regard, researchers (Kaliszewska-Czeremska & Laconi, 2015) raise the issue of teachers' psychological readiness, first, to create an educational environment using distance learning tools with varying degrees of effectiveness and safety, and secondly, to establish cooperation with students and ways to achieve educational goals. In planning collaborative work in an information and educational environment, it is worth considering the psychological readiness of both students and teachers for the effective use of information and communication technologies. The growing popularity of distance learning entails the need for careful analysis of how to create and use this form of learning.

It is also worth noting that a large number of surveys are currently being conducted that allow for a comprehensive assessment of the psychological readiness of current and future teaching staff to create an effective informational and educational environment, efficiency, safety, and psychosocial consequences of using distance learning. Research results highlight real problems related to:

— diagnosis of means necessary to create an effective informational and educational environment;
— development and implementation of teaching staff training;
— supporting teachers in the process of implementing educational goals using distance learning methods and tools;
— monitoring (and adjusting) the process of formal education, evaluating the effects of the distance learning process.

At the same time, even these few studies confirm that teachers were not ready to work with a new generation of students. And we are not talking about the differences that naturally arise between generations. The problem is that the current education system is designed for those who grew up without innovative technology. Therefore, digital natives often perceive traditional science in modern schools and universities as tedious, hopeless, boring, and fruitless. The only justification for this is obtaining the required document (diploma).

Given the current situation, teachers face the question of how to adapt the educational process to the needs of modern students – digital natives, generation Z, using modern means of distance learning, which are currently extremely relevant in foreign language learning. Theorists and practitioners unanimously agree that the appearance of this type of student requires other approaches. Teachers face a new challenge, which consists in meeting the specific needs of the modern student. Today, when a student is an educational customer, meeting his needs is especially important, because this can solve the question of the university's competitive advantages.

The analysis of modern students' expectations in our pilot study shows that a high level of education is seen as a priority for them (Banit et al., 2022). This is why it is so important to take care of the level of teaching and to continuously improve internal education quality systems. Undoubtedly, students want to use the Internet, computers, multimedia, and other means of remote communication both during classes and during preparation for them. Meanwhile, many teachers fear that the total use of new technologies will not improve students' speaking skills.

However, it should be taken into account that the generation of digital natives learns differently than previous generations, brought up in textbooks and traditional language classes, in which the teacher occupied a central place. Spending many hours on the Internet, participating in the creation of blogs, and communicating with friends on social networks, the generation of digital natives has the impression that they are not only participating in reality but also actively creating it. Thus, a language model focused on a lecturer who does not use new technologies and conducts language classes according to a predictable plan can be perceived as boring by a modern student. It is also worth noting that the digital native likes to express his opinion without discomfort and comment on other people's statements, as is done on the Internet. Unfortunately, his gaps in soft skills, such as empathy, dialogue, negotiation, or constructive criticism, make the teacher perceive the student's behavior as arrogant or pretentious. A digital native also does not like to be limited and wants to select information according to his search criteria, as is done in web browsers. Therefore, this type of student will not feel good in tasks that limit his creativity and autonomy. Thus, teachers should move from lectures to interactive joint activities that open up opportunities for students to explore and discover new knowledge independently.

Jedynak (2011) believes that the teacher's task is primarily to teach a modern student to use electronic knowledge, indicating ways to:

— distinguishing between true and false information on the Internet (for example, websites with the extension gov. or edu provide more reliable information than commercial websites with the extension com);
— paraphrasing content available on the Internet for citation in an appropriate manner, while maintaining ethical principles regarding respect for the intellectual property of other authors. In addition, the teacher should outline the advantages of other methods of obtaining knowledge, such as interviews, surveys, conversations, etc. (pp. 71–80).

It is worth noting that the use of ICT does not reduce the role of the teacher but changes it. In the traditional language model, the teacher was positioned as a source of knowledge. Now his role is different. The

student of the new generation demands autonomous and individualized learning. He expects from the teacher, not theoretical knowledge, but instructions, on where this knowledge can be obtained and how to apply it in practice. This not only does not dehumanize the teacher's communication with students but leads to greater objectification of the student. At the same time, when classes are increasingly conducted using new technologies, the role of the teacher in the didactic process seems even more important than in traditional education.

3. Conclusions

As we can see, the teacher's main task is to move away from roles involving authority, providing knowledge, and demanding that it be memorized and reproduced. Roles are emerging, the roots of which go back to ancient traditions: in ancient times, the teacher followed the student, taking into account his needs and stages of development. The teacher, responding to the student's needs, must create the conditions for learning. He often studies together with students, solving problems collectively. The changing role of the teacher is visible when the teacher and the students are involved in projects at different levels, including international projects. The teacher initiates the project, creates a defined framework defining objectives and measures, supports their implementation, and helps solve problems, but leaves the students with areas of autonomy, which they fill with their creativity. Students participate in the creation of the project plan and agree with the teacher on the scope of work and its result. It often implies a rejection of teacher domination and control, the need to react responsibly to students' needs, and to learn together with them. In traditional teaching, this is difficult for many teachers. However, in conditions of mutual complementarity of traditional and distance learning, the process of establishing new roles of the teacher occurs naturally. The student expects the teacher to diversify classes by introducing information and communication technologies. The effectiveness of such classes largely depends on the teacher's personality and attitude to technological innovations.

Given the recent events related to the pandemic and martial law in Ukraine, most teachers are now convinced of the feasibility of using distance learning tools. In this regard, the following tasks arise:

— to master the ability to comprehensively plan the educational process, developing the abilities of students based on the study of their real capabilities;
— select and combine methods and forms of learning effectively, using distance learning tools;
— implement a differentiated approach to students, creating the necessary conditions for learning, skillfully using the chosen option the organization of the learning process, and correcting it on time.

Therefore, the urgent need today is to create a new model of information and education environment, which, given all the changes in society and the minds of students, will allow the qualitative use of the creative potential of new technologies without abandoning other forms of knowledge acquisition and competence formation.

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