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## THE DIGITAL EDUCATIONAL ENVIRONMENT AS A FACTOR IN CHANGING THE STUDENT'S PERSONALITY

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**Abstract.** In the digitalization of the modern educational system, psychological development and changes in the students' personalities occur. Issues related to the digitalization of Russian education are actively discussed in the modern psychological and pedagogical community. The digital environment is a factor influencing the students' personality development process. Thanks to global digitalization, many new opportunities are being introduced into the modern educational process, but the consequences also raise serious social and psychological issues. Parallel to the general digitalization in the digital society, a child's personality, immersed in the digital space almost from the first moment of his birth and experiences a digital childhood, is formed. The digitalization of education, the use of the latest digital educational technologies, and the students' stay in a virtual environment significantly impact the students' psychological development, leading to changes in their behavior and the formation of a specific digital personality. The article presents the results of an empirical study investigating how teachers perceive modern students' personalities and behavioral characteristics of contemporary students in the digital space. It shows that modern students have psychological characteristics and traits that are characteristic of representatives of the digital generation.

**Keywords:** *digital educational environment, personality psychology, student personality, digital space, digital generation, digitalization of society, digital personality*

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The Russian Federation is implementing several national strategic initiatives to create essential conditions for developing the digital economy, increasing the country's competitiveness, improving citizens' quality of life, and ensuring socio-economic growth and national sovereignty. In particular, this includes the "Strategy for the Development of the Information Society in the Russian Federation for 2017–2030" and the "Digital Economy of the Russian Federation" program, which define digital transformation as one of the state's national development goals. The tasks for the digital transformation of education in our country for the coming decades are defined in the Decree of the Ministry of Education of the Russian Federation No. 649 of December 2, 2019, "On the adoption of the target model of the digital educational environment" and outlined in the passport of the federal project "Digital

educational environment.” The essence of the digital transformation of education is to achieve the necessary educational results for each student through the personalization of the educational process based on the use of the potential of digital technologies, including 1) the use of artificial intelligence methods, 2) the use of augmented and virtual reality tools, 3) the expansion of the digital educational environment in educational organizations and institutions, 4) ensuring a universal public Internet that processes large amounts of data (Big Data).

Modern man lives in a world of universal digitalization (from the English digital – “digital”), expressed in the widespread use of the latest digital technologies to improve the quality of life. Digital technologies make it possible to store, process, and transmit large amounts of information to an unlimited number of people over long distances and use the possibilities of artificial intelligence to solve numerous educational problems. Thus, some of the most famous artificial intelligence systems today, the neural networks ChatGPT, Watson, and others, have already reached a fairly high level of development and can learn on their own; based on a unique analysis of information data, they can formulate solutions to a number of emerging problems [1].

In a digital society, parallel to general digitalization, a child’s personality is formed, and the child is immersed in the digital space almost from the first moment of their birth and experiences a digital childhood. As they grow older, children no longer feel comfortable in their lives and can no longer imagine life without the digital space, as, unlike the older generation, they have never existed without it. Digitalization, i.e., integrating the latest digital technologies to transform an object into its digital equivalent, impacts the human psyche and its psychophysiological, cognitive, emotional, personal, and social components. Therefore, psychologists of educational institutions today, when observing the behavioral and personality characteristics of modern students, are increasingly using the concept of digital personality concerning students.

The problem of Russian education’s digitalization can be considered one of the most actively discussed topics in the modern pedagogical community. The discussion of the psychological and pedagogical aspects of digital education is primarily focused on assessing the undeniably obvious and interesting prospects for acquiring new skills and knowledge that open up in modern conditions in the training and education of the younger generation. Digitalization brings many new opportunities; digital technologies can improve the efficiency and effectiveness of learning. However, according to some Russian authors, the digitalization of education is accompanied by significant social and psychological problems; profitable gains are often “associated with significant losses” [2]. As a rule, we are talking about productive processes directly related to the development of electronic and distance learning formats associated with creating fundamentally new information, communication, telecommunication networks, and Internet technologies mediated by implementing a virtual educational environment.

On the threshold of the 21st century, the hitherto dominant industrial-humanist educational paradigm found itself in a complex and contradictory situation and faced the greatest challenge of the time – “new digital technologies that ‘hit’ both educational traditions and humanist values” [3, p. 17]. As a result of the accelerated development of information technologies and the expansion of virtual space, a new educational paradigm has emerged, conditioned by global digitalization – the digital information paradigm with its inherent digital educational environment, which has become an obligatory component of Russian education. It is worth noting that issues of digitalization, together with informatization in the field of education, have attracted the attention of scientists for several decades. Thus, A.A. Musina considers digitization to be a process of transition of education to the use of a predominantly digital information format in the teaching and administration of an educational institution [4]. V.G. Khalin, G.V. Chernova Digitization primarily means converting information into digital form. In a broader sense, digitalization is one of the directions for the effective development of humanity based on the digital transformation of information, which includes all spheres of society. The Russian pedagogical community sees the digitalization of education as “an inevitable process of changing the content, methods, and organizational forms of educational work, which is unfolding in a rapidly developing digital educational environment” [4, p. 173]. To effectively solve their problems in the digital environment, people need a certain level of knowledge, skills, and attitudes, which, according to the United Nations Educational, Scientific and Cultural Organization UNESCO, is called digital literacy. Digital literacy is the “confident and critical use of a full range of digital technologies for information, communication, and basic problem-solving in all aspects of life.” [4, p. 173].

It is evident that with the actualization and intensification of the digitalization process of modern society, in the situation of a radical digital transformation of Russian education, special attention and increased interest on the part of the psychological and pedagogical community in the controversial issues of personality development of modern children and students is required [5]. Today, representatives and methodologists of post-non-classical psychology are primarily convinced that “the digitalization of education leads to ambiguous psychological consequences for the subjects of the educational process” [2, p. 41]. In their opinion, particularly significant in the context of digital learning are the changes in students’ psyche and mental organization at the level of personal and individual psychological characteristics and qualities. This is because the personality of a student living in the inner space of a digital educational environment must be able to “move beyond the user of information and computer technologies to the subjective position of the author of their education” [6, p. 18–19]. Such changes in personalization, personality formation, and the formation of personal identity of modern students are a direct consequence of the digitalization of education and the global transition of humanity to a new type of information society. The adverse effects of the Internet and computer games on people became apparent several decades ago,

especially after the emergence of online games, when a previously unknown mental illness appeared in children and adults – computer addiction (cyber addiction), which manifests itself in emotional and behavioral disorders (loss of interest in other activities; loss of contact with others; loss of control over time spent in virtual space; turning inward when a person does not perceive or ignores external events; complex adaptation to real-life conditions) [7].

A current and very dynamic trend of our time is, according to O.L. Balashov, “the increasing use of information technologies in various areas of social life” [8, p. 83]. In particular, the generation of modern students, which is usually classified as a conditional age cohort and denoted by the letter “Z” (“digital generation”), is characterized by the most active use of digital technologies, in particular, the use of web resources in cyberspace, which is their primary means of obtaining information, as well as the main way of communicating with the social environment. It is probably worth mentioning that the term “cyberspace,” commonly used and integrated into the conceptual apparatus of digital literacy, was first introduced into everyday and academic usage by the Canadian science fiction author William Gibson in 1982. In one of the short stories in his trilogy entitled “Cyberspace,” V. Gibson considers cyberspace as an area of digital communication in which signal transmission, computer interaction, and communication networks occur. In everyday life and practice, the words Internet, network, cyberspace, webspace, web, and digital space are often interpreted and used as synonymous terms. Today, they are an integral part of students’ speech activity and life, and their digital socialization occupies a significant place in the temporal and socio-cultural space of the modern educational environment [9].

The well-known Russian company Kaspersky Lab, which develops protection systems against cyber threats, systematically monitors the presence of underage users on social networks as part of the “Raising Children in the Internet Age” program developed by its specialists. According to the data obtained by the company, 57% of all schoolchildren spend about 7–8 hours a day in the information environment. According to some data [10, p. 293], the average teenager is present in cyberspace for up to 12–14 hours almost every day, interrupted only by night sleep (according to a diary study by G.V. Soldatova, a third of teenagers also use a smartphone at night) [11]. The All-Russian Center for the Study of Public Opinion (VTsIOM) recently conducted a sociological survey, which showed that 86% of Russians surveyed “constantly use the Internet, 65% of respondents access the Internet daily, 14% weekly, and only 2% of respondents rarely look for information in gadgets” [12, p. 191]. The most active visitors to cyberspace are teenagers and young people between 16 and 34 [12]. The constant presence and deep immersion of an individual at the childhood stage of development (personality formation) in the conditions of cybernetic and digital space leads to digital socialization, the Extended Self and the formation of a digital personality, which, according to G. V. Soldatova, is considered on the one hand as a process and result of constant digitalization of a person, and on the other hand as a “complex result of

interaction and influence of information space on a person” [11], which leads to the formation of a digital generation.

A study conducted under the direction of J. Palfrey and W. Gasser focused on children and young people – those people who find themselves in the digital world at the very beginning of their lives and know this world only as such – Digital Natives, as opposed to the older generations, who were given the code name Digital Immigrants. The study’s authors believe that Digital Natives will create a society where many things will change: psychology, ethical standards, and the creative process. Digital Natives see no difference between life online and life offline. Social networks, blogs, virtual contacts, online role-playing games, and online learning allow a person to create and experiment with numerous copies of themselves. According to the authors of the study, this deepens human nature. However, teenagers often replace real life with virtual life and immerse themselves in it. And perhaps, according to J. Palfrey and U. Gasser, the lion’s share of the digital generation will be made up of Digital Misfits who have failed in their personal or social lives [13].

The study of specific psychological characteristics of the personality of representatives of the digital generation (modern children, teenagers, girls, and boys) is very relevant since today’s psychologists are actively discussing how to develop effective strategies for interpersonal communication and interaction with the digital generation [14]. The scientific community began discussing the creation of a universal generational theory in the late 1980s when American demographers Neil Howe and William Strauss independently described settlement cycles repeated throughout human civilization. In 1991, they published a joint book entitled “Generations: The History of America’s Future, 1584 to 2069”, in which the history of humanity (since 1584) is presented as a series of numerous biographies of representatives of different generations. In 1997, they published another joint book entitled “The Fourth Turning is Here,” W. Strauss and N. Howe further developed their generational theory and wrote about the four-part settlement cycle and repeating patterns of human behavior in world history. According to W. Strauss and N. Howe, the development of social history takes place in cycles whose approximate duration corresponds to a person’s life expectancy (80–90 years). The researchers gave the most detailed description of the collective and, simultaneously, a typical representative of each generation up to modern times (from the beginning of the 10th century to the present). The result of the analytical work was the identification of several dozen settlement cohorts, which the authors call social generations (Generation of Freedom, Generation of Compromise, Generation of Missionaries, Lost Generation to the Greatest Generation, followed by the Silent Generation, Baby Boomers, Generation X, Millennials, Generation Z and currently Generation Alpha). At the same time, the researchers note that each social generation they have identified is divided into four generations whose representatives have similar values, ideological attitudes, and behavioral strategies. In generational theory, they have been given the usual names: Prophets, Nomads, Heroes, and Artists. These four generations replace each other cyclically every 20–25 years or so, and then their inherent behavioral

patterns (crisis, rise, decline, awakening) repeat themselves. In other words, the four generations' cycle begins repeatedly. Accordingly, the values and views of each generation differ from those of their parents [15].

The conceptual foundations of the Strauss-Howe theory of generations for Russian society, taking into account global events in Russian history, were developed by the organizers of the project "RuGenerations" ("Theory of Generations in Russia"), psychologists E. M. Shamis and E. V. Nikonov (in 2002–2004). In particular, they were able to characterize with sufficient accuracy the mental and behavioral features of the generations living today: the Great Generation (Winners, born 1901–1927); the Silent Generation (Artists, born 1928–1944); the Thawing Generation (Baby Boomers, Gagarin Generation, born in 1945–1962); Generation X (Xennials, an independent generation, born 1963–1981); Generation Y (Millennials, Internet Generation, born 1982–2002); Generation Z (Zoomers, digital generation, born 2003–2024). Further research on the domestic generations was conducted at the Institute of Sociology of the Russian Academy of Sciences (M.A. Anipkin, A.V. Yurchan, D.Ya. Travin). The Soviet Baby Boomers (born 1945–1962) are today the most studied generation from the point of view of social anthropology and social psychology. In the contextual framework of this article, the greatest attention is paid to the digital generation (Generation Z, Zoomers, born 2003–2024) – the generation of modern students (children, teenagers, high school students, college students), which is now actively entering the phase of active life organization. It is worth noting that in the early 2000s, at the suggestion of Australian futurist Mark McCrindle, a number of researchers within Generation Z identified the centenarians, the Little Alphas born after 2010, who intuitively mastered a smartphone by the age of two. Alpha children have a different way of thinking and perception of space and time. They are often uncommunicative. They do not ask their parents, "Why?" and they can find the information they need almost immediately in the digital space.

An analytical overview of studies describing the psychological characteristics of representatives of the digital generation (Generation Z, Zoomers) can be found in some works by Russian scientists (A.V. Sap, E.R. Isaeva, A.V. Shamne, V.V. Radaev, and others). The term 'Zoomers,' referring to Generation Z, is derived from 'Boomers' (Baby Boomers), reflecting a generational continuity rather than the smartphone zoom function. It highlights Generation Z's quick adaptation to technology and their fast-paced lifestyle. The characteristics of Generation Z include: 1) they value independence and seek new forms of communication rather than the traditional dialog of previous generations; 2) they are known for their entrepreneurial spirit and often start earning money at a young age, often through internet-based ventures; 3) research suggests that they use fewer drugs and alcohol compared to their predecessors, reflecting a shift towards a healthier lifestyle; 4) they are reportedly more likely to suffer from mental health issues such as depression, highlighting the need for greater support and awareness of mental health.

G.V. Soldatova writes that Zoomers perceive objects of digitalization as an integral part of themselves. “A smartphone is one of the first and most important types of property a teenager owns; the device is always nearby” [11]. The importance of the digital world for students is reflected in the emergence of new types of anxiety among them. In the studies conducted, the fear of being without a smartphone (nomophobia) is “mentioned as a strong fear by one in three teenagers, the fear of losing reputation in social networks by one in two, and the fear of being without access to social networks by more than 70% of respondents” [9].

According to S.V. Vasilenko, those born at the beginning of the third millennium are the children of digital products who prefer to communicate virtually. Among the psychological characteristics and personal traits of the representatives of the digital generation, S.V. Vasilenko lists

- restlessness, impatience, inability to concentrate on a long installation;
- attention deficit hyperactivity disorder (ADHD) as a result of constant multitasking (e.g., students listen to music, chat, edit photos, and do homework at the same time);
- clip-based thinking, characterized by students’ ability to perceive the world around them through a vivid image, a message embodied in the format of short and colorful video clips (gif, short films, other similar options);
- deterioration of memory performance, shortening the duration of the act of concentration tenfold (up to 8 seconds);
- students spend most of their free time in cyberspace, preferring virtual games to communication with real people and toys
- can create a website, flash movie, multimedia presentation, or computer game in a short time (and receive financial compensation for their work);
- introversion, isolation, unsociability, tendency to autism [16].

So we see that the students of the digital generation are children born in an already digitized society, who grew up in a digital childhood (“with a smartphone in their hands”), who can only imagine their existence with the mobile Internet, who have certain personal characteristics and behaviors – introversion and silent behavior. This has led to the emergence of another term for the digital generation that is quite widely used – outlander. E.M. Ozhiganova writes that there is an idea according to which the digital generation will retreat into itself by analogy with the silent generation that appeared in world history 80 years ago (‘artists’), but unlike the ‘artists,’ it will find refuge not in fine arts and literature, but in virtual reality [15, p. 97]. The reason for their isolation and unsociability is their constantly accustomed way of life, the ‘modus vivendi’ in virtual space. The digitalization of society determines these personal and behavioral changes. The emergence and creation of new digital technologies, including those actively used in the education system, ultimately change the life of society in all directions and lead to a unique development and transformation of students’ personalities [17].

Summing up, after the analytical review of the available publications characterizing the personality and behavioral features of children and students of our time, it can be said once again that the digital generation undoubtedly

requires individual psychological and pedagogical support from psychologists of educational institutions, an original approach and a non-standard system of training and motivation on the part of teachers [18].

To empirically verify the individual psychological characteristics of modern children and adolescents learning in the context of the digital transformation of education, we conducted an empirical study to investigate teachers' perceptions of the personal and behavioral characteristics of representatives of the digital generation (born 2003–2024). A number of methods relevant to the study of social ideas were used, including 1) survey (free association method), 2) elements of content analysis, and 3) prototypical analysis according to P. Verges (modified version) [19]. The study involved teachers (N = 50) actively engaged in teaching and educational activities as subject teachers, classroom teachers, school psychologists, teachers of supplementary educational systems, and heads of educational institutions. The survey was conducted remotely using Google Forms social survey software. At the end of the academic year 2022–2023, the survey participants – practicing teachers, including graduates of Tomsk State Pedagogical University – received emails and messages (SMS, WhatsApp, email) with a request to follow the Google link contained in them and answer a question. Respondents were asked to name five or more free associations (the first words or expressions that came to mind) with the term 'modern learner' and rank them in order of decreasing importance.

The survey results yielded 307 verbal associations with the term 'modern learner' (6.14 per respondent). Most associations obtained were generalized and semantically systematized using the content analysis method. They were presented in the form of a single list of 15 generalized terms:

- 1) Social networks (hyperconnectivity, lack of live communication, messengers, YouTubers, bloggers, subscribers, virtual friends, gadgets, netogolism, nomophobia, fear of being without a smartphone);
- 2) Passionate (goal-oriented, results-oriented, interested, engaged, inspired, absorbed);
- 3) Computer games (gamification, video games, gamers, e-sports, e-learning, educational games, gaming addiction, computer literacy, virtual space, augmented reality, 3D VR glasses, virtual reality glasses);
- 4) Demanding (meticulous, capricious, picky, fussy, with high standards, with high expectations, dissatisfied with everything, perfectionist);
- 5) Self-confident (brash, arrogant, overbearing, with inflated self-esteem, thinks they are exceptional, pushy, assertive, narcissistic);
- 6) Highly vulnerable (painfully vulnerable, overly sensitive, hypersensitive, ambitious, helpless);
- 7) Mercantile (prudent, thrifty, self-serving, frugal, far-sighted, acquisitive, sensible);
- 8) Physically inactive (sedentary lifestyle, lazy, sluggish, stagnant, spends all day in front of a screen);
- 9) Original (does not behave according to the pattern, unusual, original, unique, not like everyone else, talented);



10) Critical thinking (creative, good observation skills, knows how to justify his point of view, focuses on the phenomenon that interests him, ability to communicate his arguments to others);

11) Reticent (secretive, isolated, uncommunicative, antisocial, uncommunicative, minds his own business, keeps to himself);

12) Hyperactive (restless, irritable, impulsive, super active, super energetic, impatient, no control over his behavior);

13) Dehumanization (bullying, harassment, physical violence, indifference, deviant behavior, addictions, aggressive, cruel, verbal aggression);

14) Clip consciousness (superficial perception, thinking in images, low concentration of attention, making a decision quickly, finding the necessary data rapidly, searching for information instantly);

15) Anxious (full of fear, existential anxiety, social phobia, nervousness, fear of the Unified State Exam, restless, depressed, stressed, excited, irritable).

For each of the 15 generalized concepts, two mathematical and statistical descriptive parameters were calculated: the concept's occurrence frequency (F) and its average rank (R). The following were identified (at  $p = 0.02$ ):

– high (HF) and low (LF) frequency of occurrence of associations, based on the median value (Me):  $HF > 60$ ,  $LF \leq 60$ .

– high (HR) and low (HR) ranks of associations:  $VR \leq 3$ ,  $HP > 3$ .

Subsequently, the results obtained were correlated with the 'Verges quadrants,' which represent the intersection of two parameters – the frequency of occurrence (high, low) and the average (high, low) rank of the association (Table 1).

Table 1

*Structure of teachers' perceptions of the social construct 'modern student,'*  
with  $p = 0.02$

DESCRIPTIVE OPTIONS	High Rank (HR), rank $\leq 3$	Low Rank (LR), rank $> 3$
High frequency (HF), frequency $> 60$	HFHR quadrant: – Social networks (203; 1); – Passionate (192; 1); – Computer games (189; 2); – Demanding (183; 3).	HFLR quadrant: – Mercantile (197; 4); – Original (193; 4); – Critical thinking (168; 5); – Reticent (77; 5).
Low frequency (LF), frequency $\leq 60$	LFHR quadrant: – Self-confident (56; 2); – Highly vulnerable (49; 3); – Physically inactive (41; 2).	LFLR quadrant: – Hyperactive (59; 4); – Dehumanization (57; 4); – Clip consciousness (40; 5); – Anxious (37; 5).

It turns out that “the intersection of the two axes denoting these parameters (high and low frequency of occurrence, high and low rank) forms four areas (quadrants) on the plane (Verges coordinates) that correlate with the structure of the studied ideas about modern students [20, p. 138]. In particular, the items (respondents' statements) that fall in the high frequency and high rank (HFHR) quadrant form the core of the 'social idea' about the construct 'modern student'

that was analyzed in our case. The most frequent and highest ranked (1–3) is the construct ‘modern student,’ which is associated with the generalized concepts of social networks, determination, computer games, and high aspiration level. The remaining quadrants (HFLR, LFHR, and LFLR) form the periphery of the representations, but it is worth noting that you can find your hierarchical ordering here. In particular, the LFHR (low frequency, high rank) and HFLR (high frequency, low rank) quadrants form the near periphery of the periphery zone. P. Verges, I.B. Bovina, and other authors consider them an area of change and transformation of social ideas about the construct under study. The most variable features are Commerciality, isolation, self-reliance, increased vulnerability, and inactivity. Finally, the quadrant with associations of low frequency and low rank (LFLR) forms the most distant and mobile peripheral area, reflecting the diversity of subjective ideas about the semantic construct under study. The list of associations that can be assigned to this domain is quite extensive: hyperactive, dehumanization, clip consciousness, and anxiety. (Table 1 shows only the most important of these).

The results of the prototypical analysis of empirical data obtained in a survey of practicing teachers allow us to conclude that the modern student and his personal characteristics and individual psychological traits are statistically reliably associated with the attributes of digitalization and digital space. In particular, we can assume that the introduction of the latest digital technologies, the implementation of digital education through tools such as the educational technology market (EdTech), virtual and augmented reality, gamification, and others lead to personal and behavioral changes, gaming addiction, new manifestations of the child’s psyche (clip consciousness, clip thinking). A decrease in the ability to socialize is observed, replaced by digital socialization, which manifests “in growing tendencies of social isolation, anomie, individualization of human existence and the rapid migration of young people to the virtual world” [9, p. 192]. Such tendencies are of serious concern to teachers, parents, psychologists, and the public today, as they clearly impact social deprivation and contribute to people distancing themselves from each other. It is possible to overcome these negative phenomena only through manifestations of care, attention, participation, and cooperation in terms of closeness and distance and the formation of altruistic behaviors and relational norms.

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## ЦИФРОВАЯ ОБРАЗОВАТЕЛЬНАЯ СРЕДА КАК ФАКТОР ТРАНСФОРМАЦИИ ЛИЧНОСТИ ОБУЧАЮЩЕГОСЯ

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**Аннотация.** В условиях цифровизации современной системы образования происходит психологическое развитие и трансформация личности обучающегося. Вопросы, связанные с цифровизацией российского образования, активно обсуждаются в современном психолого-педагогическом сообществе. Цифровая среда выступает фактором, оказывающим влияние на процесс развития личности обучающегося. Благодаря глобальной цифровизации в современный образовательный процесс привносятся много новых возможностей, но ее последствия также представляют собой серьезные социальные и психологические проблемы. Параллельно с всеобщей цифровизацией в цифровом обществе происходит формирование личности ребенка, который практически с первого момента своего рождения погружается в цифровое пространство и проживает цифровое детство. Цифровизация образования, применение новейших цифровых образовательных технологий, пребывание обучающегося в виртуальной среде оказывают существенное влияние на психологическое развитие школьника, приводят к трансформациям его поведения, формированию специфической цифровой личности. В статье приведены результаты эмпирического исследования представлений педагогических работников о личностных и поведенческих особенностях современных обучающихся, пребывающих в условиях цифрового пространства. Показано, что современные обучающиеся обладают психологическими свойствами и качествами, присущими представителям цифрового поколения.

**Ключевые слова:** *цифровая образовательная среда, психология личности, личность обучающегося, цифровое пространство, цифровое поколение, цифровизация общества, цифровая личность*

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