

Information Competences of Young People within Digitalization of Society



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Abstract. Young people are the object and subject of social relations. The relevance of the research is the need to study the readiness of young people for rapid, unpredictable, and often manipulative impacts of society digitalization. It is also necessary to identify the level and features of information competences of the youth's forefront – university students. They, by definition, due to their main activity – study, should share values of digital society and culture not just as ordinary consumers but as active and competent users. The scientific novelty of this work is the analysis of contradictory changes that occur under the influence of digitalization in all spheres of public life and a young person's personality. According to the results of the sociological study, conducted in 2014–2019, there was the contradiction between levels of information competences that are necessary and available for successful adaptation to life in digital society among Astrakhan, Volgograd, and Moscow's university students: most respondents possess the level of an ICT user, and only a small share of people has the competence of an ICT creator. Besides, the frequency of Internet logins for educational and professional activities decreases, and the number of Internet logins for leisure and pleasure increases. This trend may reflect dysfunctions of online education, which is an attribute of digital society, and destructive manifestations of Russian society digitalization. In addition, the current generation of young people is more like digital migrants who learn the language of the Internet as well as a migrant learn the language of a host country. Thus, they are unlikely to use the whole potential of ICT in their lives, their social capital is primarily formed of other sources.

Key words: youth, digitalization of society, information competences, students.

Introduction

Youth is not just an object but also a subject of public relations: the future of the country depends on them. It acts as the forefront of the innovation spread (electronic technologies, for example). Currently, Russian society is at a new stage of the society informatization – digitalization, when a young person deals not only with a certain information and communication technology but with an information and analysis (information and expert) system which is a set of interrelated technologies [1]. Ongoing technological changes and its impact on society and young people as a socio-demographic group are so rapid and unpredictable that the terminology itself appears very quickly. With it, researchers try to reflect on fundamental social transformations – “post-industrial society”, “information society”, “knowledge society”, “informatization”. Now, digital society, which is not yet comprehended by researchers, occurs in an everyday life of young people in a

powerful, comprehensive way, changing it, quite often, by manipulative means (when a young person is not warned and has no idea about the consequences).

According to 2017 data of the European Commission, the most important indicator of digitalization (along with the connection of subscribers to the Internet (fixed broadband connection, mobile broadband connection, speed, and affordability), Internet usage (content, communication, and transactions), integration of digital technologies (business digitalization and e-commerce), and digital public services (e-government)) is human capital – primarily, digital competencies [2].

Researchers disagree about the content characteristics of “society digitalization”, “digital society” concepts and its correlation with associated concepts – “post-industrial society” [3], “information society” [4], “network society” [5], “digital capitalism” [6], “peeping” capitalism” [7]. The term

“hybrid world” is also used. It is characterized by the fusion of virtual and real environments on the basis of digitization of the whole surrounding world including business processes, biomaterials of the surrounding world and a person, complete information about a person [8]. In this regard, the content of the “digital competence” concept is not clear too.

The logic of our thoughts on contradictory challenges of digitalization in various spheres of public life caused the choice of the term “information competences” for achieving the research purpose. We would like to note that there are different points of view toward relations between “digital competences” and “information competences” concepts. Thus, several researchers believe that the concept of “digital competences” includes the concept of “information competences”: each of these concepts is associated with a certain stage of society development – information, digital [9]. There is also a research view according to which information competences are understood as broadly as possible – as activity skills in relation to information in educational subjects, areas, and the surrounding world [10, p. 45–46; 11, p. 52]. With such a broad understanding, it is necessary to clarify the key concept – “information”. In common views, information could be understood as the entire flow of messages. However, according to the authoritative opinion of K.E. Shannon [12], information is a message that reduces a consumer’s uncertainty. Similarly, N. Viner analyzes the amount of information in a system as a measure of its organization [13, p. 56]. A number of researchers define information as the main spiritual content [14] constituting the social system’s structure [15, p. 63]. Thus, information competence is a universal characteristic of a person that provides an ability to determine the main content of the system, establish connections with various forms of a human life on the basis of creativity

and goal setting. Digital skills are a component of information competencies.

The purpose of this article is to analyze the level and features of information competences of university students. To achieve this goal, several aims should be achieved:

1) to investigate the impact of digitalization on various aspects of public life as a range of challenges to the content of young people’s information competencies;

2) to determine on the basis of the results of a specific sociological study:

– the level of information competencies of young people – the user level, ICT creator level;

– features of information competencies of this young people’s generation, which are determined by the specifics of their activities in choosing information sources.

What are the contours of digital society in the most general approximation where a modern person will exist; what information competencies, knowledge, skills, and values a member of the younger generation should acquire now, during school studies, in a university or college in order not only to successfully adapt to surrounding social reality but also to creatively recreate and transform it. After all, the ability to create, transform, and develop is a manifestation of the essence of a Human-person, and not just a human as a biological being.

Without a doubt, digital society is a complex techno-social system [16, p. 42], where rapidly changing technologies largely determine activity modes, behavior, ways of thinking, and even frameworks (boundaries) of a real/virtual, material/ideal, human corporeality and consciousness. Researchers note that “digitalization is a transformation, and technologies are its tools. It is important to note that these transformations depend on a large-scale technology adoption. Some of these technologies already exist, and it is used

in different ways: mobile Internet, Internet of things (IoT), and artificial intelligence (AI). Other technologies exist, but it has not yet been adopted in scales necessary for providing any meaningful impact on our way of living: three-dimensional (3D) printing and next-generation genomics [17]. The list of these technologies is being updated, but the essence of digital society, as a new development stage of information society, is that “activities are implemented through the digital representation of objects. Procedures for converting objects of various nature into a digital form (a digital model) and vice versa became possible due to achievements in the field of digital information technology, and it may be used, or it is already used, in almost any field of human activity”. Using the creation of a digital model of a material or non-material object, a new material or non-material object [18, p. 198], a new techno-digital form of existence [19, p. 178], which transform all spheres of public life and a person, are created.

For example, characteristics of economic relations change. In particular, the mechanism of market value formation, market business models are integrated into a virtual (digital) sector; a number of intermediaries significantly reduces; the importance of an individual approach to product formation increases; there is a separation of “analog” and “virtual-digital” economies; fifth-generation communication networks emerge. “Duplication of a “similarity” of business niches in the Internet generates high competition, and it causes the formation of an economy of ultra-high images and ultra-high rating levels. There are peer-to-peer interaction models (client-client) that are implemented using digital platform services (Uber, BlaBlaCar, BelkaCar, Airbnb, etc.); an economy based on the Win-Win model (both sides win): on the one hand, owners of assets who can lease it for a fee, and, on the other hand, consumers of assets who lease an asset for solving a specific task in the short-term period”.

There is a transformation of management – from a centralized one to decentralized; the function of money changes: when a contract and money are one and the same, it may lead to crypto-socialism. “In this type of society, economic relations are digitized; in relations of entities, everything is aimed at reducing the Commission costs” [8, p. 591–592].

It is assumed that principles of human management will also change, and institutional and regulatory spheres will transform. Expert systems “will soon allow creating an environment of a high-tech digital platform of state administration, which will ensure the minimization of the human factor and accompanying corruption and errors, automate the collection of statistical, tax, and other reports, and ensure decision-making based on the analysis of a real situation” [20, p. 280].

A number of researchers review digitalization processes in the economy in a positive, even rosy-positive, way; they highlight the openness, transparency of digital communications in the economy, its role in the creation of a qualitatively new socio-cultural environment, social lifts, the erasure of geographical borders, which will allow residents of remote settlements to receive good education, improve their skills and find a job [21–27]. N.M. Abdikeev notes that “cognitive and creative human component of technological processes and intellectualization of production become defining development factors. The core of the new economic system, which is developed on the basis of information technologies, is an intellectual activity, which ceases to be an application and appendage of the machine production of material goods” [28, p. 25–26]. According to T.N. Judina, there was no cohesive understanding of the digital economy, which has been developing in Russia for three years. She highlights that the digital economy is a forming system and, possibly, an *antisystem* of “productive and/or

economic relations which may function *without a direct human involvement* “in the production sphere as Industry 4.0 (cyber-systems together with the “Internet of everything”), virtual distribution, exchange through digital platforms, and individualized consumption” [29, p. 7] (*authors’ italics*). Judina’s opinion that the digital economy may become an antisystem existing without a man is somewhat confirmed by the existence of a phenomenon in a modern labor market that show (in K. Marx’s terminology) the scale of a labor alienation – the productivity paradox. Digital technologies become a factor-provocateur which, although increasing labor productivity, slows its growth rate – it could be seen in the last decades [30].

The humanity of digitalization’s consequences in the socio-economic sphere of society, in particular, for providing employment, is not completely clear. On the one hand, the introduction of digital technologies into production leads to the creation of new jobs (for example, in the United States, one job in the ICT industry provides almost five new jobs in other industries). However, on the other hand, “more than 80% of developed countries’ population and only about 30% of developing countries’ residents had access to the global web in 2015. An important remaining risk is that, in the process of so-called natural economic selection (for example, in a race for a consumer), many players of the digital technology market resort to a policy of dumping prices, thus, increasing the consumer basis, i.e. the risk of monopolization in a particular industry and the risk of concentration emerge. It is interesting to note that, with the introduction of digital technologies, the importance of highly qualified personnel grows (enterprises try to increase their number among the staff) along with the share of low-skilled employees. Digital technologies that substituted standard, routine work duties forced low-skilled personnel to leave their workplaces or move to

a less skilled (less paid) jobs. At the same time, the share of the main part of the working class (the middle population class) declines, and there is a global increase of income inequality” [31, p. 5–6]. There is a forecast that, in the next ten years, a number of job places will decrease by 6.7 million in Russia alone [32, p. 32].

Prospects of digitalization’s impact on the cultural sphere are even more obscure. The technical potential of modern media allows introducing new attitudes into the mass consciousness which are related to technologies for manipulating a human body and behavior. After all, these technologies are so revolutionary that they should provoke questions and answers about boundaries of what is allowed in this area and what is not. A system of values should be formed, a new culture that makes a human a Person should emerge. However, if this culture is formed on the basis of attitudes of consumer society, then a fundamental question becomes relevant: what are true values that are a foundation of true human existence, and how to separate it from pseudo-values which may make a human life become a part of the market of biomaterials.

Indeed, a new form of culture is being formed – electronic, digital. It still bears features of a protoculture which becomes a cultural system, a social institution [33–35]. A cartography of a personal and social life within this type of culture is not yet clear, and no models of identity identification have been proposed [36]. Therefore, researchers suggest that, currently, public systems represent special socio-technological landscapes, where modern trends of digitalization coexist with generally accepted cultural values [37, 38]. In our opinion, in this situation, it is possible to actualize traditional forms of culture even among young people, who are influenced by digitalization and its ideology in a most significant way.

What are the requirements of digitalization for a young person's personality, what social qualities should he/she receive and learn for socialization at the stage of the transition from youth to adulthood and maturity to be considered successful? According to S.A. Dyatlov, it requires high qualification, mobility, creativity, and significant intellectual capital of an employee who becomes "the main factor of high dynamism of global information economy and success within global information hyper-competition, contributes to decline of knowledge, communication, and economic entropy" [39, p. 17]. Such employee possesses an important competence – the competence of assessing time as the main non-renewable resource of the high-speed economy [40, p. 47]. According to N.V. Zubenko and D.V. Lanskaya, successful socialization of a young person consists of overcoming the main risk of today – digital backwardness. It could be done on the basis of a qualitatively new education which, as a part of spiritual production, comes to the fore outpacing material production in terms of importance and significance. Spiritual production is designed to balance high psychological, technogenic, informational, and anthropogenic risks, threats, costs and dangers of the technological revolution associated with the sixth and seventh technological orders [41, p. 145–146]. These risks are very high: it includes the reduction of authentic interpersonal communication, the formation of a hybrid identity, a "digital identity"; the saturation of the information space with simulacra; real time total control over human movements and activities; legal risks, in particular, the usage of personal data for fraudulent and illegal purposes; digital inequality; the alienating influence of various models of so-called efficient management, aggravated by smart "digitalization" [42–

48]. T.F. Kuznetsova also predicts significant changes in the humanitarian sphere of public life, and she emphasizes the crucial role of humanitarization of "all levels and forms of the educational process. It would be wrong to weaken the digital component of this process, since microsystem competition moves from the economic sphere to the cultural one, and digital education does not provide national security in this segment. Humanitarization is a technocratic attitude counterforce to the education system, and it makes it possible, without losing the orientation of the system toward the future, not to abandon Russia's achievements in education" [49, p. 34].

Let us turn to the study of information competencies of students in Russian universities. The choice of university students as the target audience of the research is not accidental. University students are the forefront of youth, the future managerial elite of the country. For students, study is a priority activity aimed at introducing them to values of, in general, society, culture, and, in particular, emerging digital society [50]. At the same time, it is implied that students should not just study digital technologies as ordinary consumers, but they should also be able to develop it in the future as active and competent users.

Methodology of the research

Under the leadership of S.V. Kargapolov, a sociological survey "Electronic culture of university students" was implemented among students of higher education institutions in Astrakhan, Volgograd, and Moscow (the first stage – May, 2014, N = 750 people; the second stage – October–November, 2018 (N = 1.128 people). In March 2019, Moscow university students were also interviewed (N=1.240 people). The study had a probing nature, the task of sample representing was not set, the obtained results may only apply to the sample set or used as a reference. However, the number

of respondents allows making assumptions and formulating hypotheses. Data processing and analysis were performed using SPSS 17.0. Considering the difference of the study timing in the metropolitan area and cities of the Nizhne-Volzhskiy region, the comparison of the results may only be conditional, but inter-regional comparisons clearly show the influence on digitization processes of the specific local-territorial environment, among which, for example, the territorial conditions for choosing a university, the state of the regional education system, the specifics of the mentality, the living world of the population of the region [51]. To reach a set goal, we analyzed student responses to questions indicating the level and features of their information competencies: “From what sources do You mostly get the information You are interested in?”, “After getting into a difficult situation, You usually turn first to ...”, “Is it easy for You to understand the interface of a program, website, or device?”, “At what age did You first use the Internet?”, “At what age did You first use social networks?”, and questions about the frequency and aims of usage, creation of different electronic resources.

Results of the research

As we have mentioned earlier, information determines the main thing in the system’s spiritual content. At the same time, an information source (channel, means) has a significant impact on the specifics of the system functioning, in our case – people’s

consciousness, thinking, and, accordingly, ability to process, transmit, and store information [52–54]. Thus, information competences of a person are implemented in the selection of information sources. Specifics of information competencies of a young person in electronic, digital society are showed by the results of responses to the question “From what sources do You mostly get the information You are interested in?”, which involved a multiple (up to three options) choice (*Tab. 1*). Thus, the Internet as a source of information was chosen by most respondents, and the share of those who select this option increases. However, interestingly, with the priority of the Internet, the share of people who chose a book as a source of information also increased. In Moscow, which is a megalopolis where all innovations (in our case, electronic technologies) should spread faster, the share of appeals to a book, even in 2019, is not less than in cities situated in the South of Russia. In our opinion, it shows the actualization of traditional forms of culture within the formation of electronic culture among students.

Thus, the assumption that new mass media play not just a priority but a dominant role in the socialization of the younger generation is not confirmed. When faced with a difficult situation, about 60% of students in Astrakhan and Volgograd turn to their parents and relatives, every fifth student – to friends, and only every tenth student – to Internet search

Table 1. Students’ responds to the question “From what sources do You mostly get the information You are interested in?”, (% of respondents)

Option	Astrakhan		Volgograd		Moscow
	2014	2018	2014	2018	2019
Television	44.9	37.1 ↓	35.6	33.5	23.6
Internet	90.6	95.4	95.4	98.0	95.4
Relatives, friends, colleagues	37.1	53.2 ↑	46.9	61.4 ↑	50.6
Press (Newspapers, magazines)	10.6	8.0	10.6	5.1	6.8
Radio	9.4	5.8	8.4	5.3	4.5
Books	24.1	29.4 ↑	27.4	32.2 ↑	28.8
Professional and popular science magazines	5.7	6.6	7.7	7.1	9.3

Table 2. Students' responds to the question "After getting into a difficult situation, You usually turn first to ..." (% of respondents)

Option	Astrakhan 2018	Volgograd 2018	Moscow 2019
Parents	54.8	56.3	35.8
Relatives	8.0	6.2	6.9
Friends	20.2	18.0	32.7
Internet search system	10.6	8.9	14.5
Social networks	0.4	0.2	2.1
Hesitate to answer	5.2	7.5	6.1
Refuse to answer	0.7	2.0	1.9

systems (*Tab. 2*). In other words, the preference is given to an interpersonal social circle rather than electronic communications. In addition, the share of requests to relatives, friends, and colleagues as sources of information has significantly increased. We may conclude that the choice of a specific source of information is situationally determined. Even among Moscow students, the share of appeals to relatives is high. Although, often, there is not enough time for live communication in a metropolis. This is probably the reason why only 42.7% of Moscow students turn to their parents and relatives in a difficult situation, but many more of them turn to friends, and 14.5% turn to Internet search systems for answers to difficult questions, which is close to the 15% socially significant defining point. It should also be noted that the share of those who chose TV as a source of information has significantly decreased among Astrakhan students, and now it is close to the share of students who did the same in Volgograd. Among Moscow university students, the share of those who prefer television is much less.

In the second wave of the study, respondents were asked a question concerning information competences of students: "Is it easy for You to understand the interface of a program, website, or device?". The option "easy" was chosen by 60% of respondents, the option "easy, with instructions" was selected by, approximately, every fourth, fifth respondent, the option "problematic, ask for help" was chosen by, approximately, every tenth respondent. A statistically insignificant percentage of respondents – less than 3% – cannot understand the interface on their own (*Tab. 3*). It should be noted that the level of digital literacy, demonstrated by students in different towns, does not differ significantly. Although, it could be assumed that students from Moscow – a megapolis – who were also interviewed six months later than Astrakhan and Volgograd's students, would show a higher level of digital literacy. Moreover, the average age of Moscow students during their first access to the Internet was 10.2 years, Volgograd students – 10.7 years, Astrakhan students – 11.5 years. In

Table 3. Students' responds to the question "Is it easy for You to understand the interface of a program, website, or device?" (% of respondents)

Option	Astrakhan 2018	Volgograd 2018	Moscow 2019
Easy	58.2	57.2	59.5
Easy, with instructions	27.6	26.8	27.1
Problematic, ask for help	9.9	9.1	8.9
I cannot figure it out by myself	0.9	1.3	1.6
Hesitate to answer	2.2	3.1	2.8
Refuse to answer	1.2	1.3	0

our case, the smaller the population of a town and the further it is located from Moscow, the higher the age of the first Internet access. The same trend was observed while analyzing the average age of the first social network connection: in Moscow, it was 11.6 years, in Volgograd – 11.9 years, in Astrakhan – 12.8 years.

Digital literacy has become an integral part of information competencies. For example, the share of students who, for the last year, has been using the Internet and a mobile phone once a day and more often approaches 100% (Tab. 4). Among Astrakhan residents, there is a significant increase of social networks usage, and, in general, the frequency of accessing social networks is comparable to the frequency of using the Internet and mobile phone. The share of Astrakhan residents who use messengers once a day and more often for communication sessions increased from 11.8% to 60%. It is similar to the same indicator among Moscow students. Interestingly, among Volgograd residents (there is a vast number of “techies”, who are enrolled in technical education, among population), the growth was also significant, but, in 2018, it was lower than among Astrakhan and Moscow students.

The share of computer users significantly decreased: it was replaced by gadgets. However, there are many questions on whether a gadget can fully replace a computer for performing all educational and professional tasks, espe-

cially among students enrolled in technical education. It should be noted that the lowest percentage of students who use a computer once a day and more often is registered among Moscow students. The frequency of using e-government portals changed slightly: only one out of three students visits these websites once a month. 11.5% of Astrakhan residents, 9.3% of Volgograd residents, and 6.6% of Moscow students have never used e-government portals.

The ability to use electronic technologies is an evidence of a minimal and insufficient level of information competences within digitalization. The norm for a digital society is the level that allows a user to create electronic programs himself, if necessary. According to researchers, the level of an electronic programs creator, programming skills in assembly languages and languages of “high level are required not only for narrow specialists, because they contribute to the formation of managerial skills, if the task of such formation is to be solved seriously” [55, p. 55]. This is required for bringing information competencies in line with trends of the digital economy. “Projected professions of the future show an increasing role and expansion of boundaries of programming application” [56, p. 986]. The founder of the Davos Forum, Klaus Schwab, called programming the second literacy [57]. Knowledge of programming algorithms in the digital age may be compared to knowledge of the alphabet. Like, for example, alphabetic and hieroglyphic writing forms a

Table 4. Students' responds to the question “How often did you use it in the last year?”
(% of respondents who chose the answer “once a day and more often”)

Option	Astrakhan		Volgograd		Moscow
	2014	2018	2014	2018	2019
Computer	86.1	61.7 ↓	91.4	67.6 ↓	52.8
Internet	91.8	95.1	96.0	94.5	94.0
Mobile phone/ smartphone	93.9	96.3	94.9	95.6	94.6
Social networks	74.7	91.9 ↑	90.5	89.8	92.2
E-government portals (public services, GIBDD, etc.)	3.7	6.8	3.8	3.5	7.7
Communication sessions using the Internet (Skype, WhatsApp, and other messengers)	11.8	60.0 ↑	20.8	40.1 ↑	59.1

Table 5. Students' responds to the question "How often did you in the last year...?" (% of respondents)

Option	Created electronic programs			Created websites	Processed videos or photos
	in educational activities	in professional activity	to make everyday life easier		
Once a day and more often	Astrakhan	7.8	7.2	3.1	16.5
	Volgograd	6.4	6.2	1.1	9.5
	Moscow	10.2	7.8	6.4	18.5
Two or three times per week	Astrakhan	12.1	8.4	1.9	19.9
	Volgograd	14.2	9.8	1.1	16.4
	Moscow	13.0	8.6	6.2	26.5
Once a week	Astrakhan	10.3	6.1	1.6	16.5
	Volgograd	23.3	11.8	1.6	17.3
	Moscow	12.9	8.3	6.1	18.2
Once a month	Astrakhan	10.6	6.4	4.6	19.6
	Volgograd	11.1	8.0	4	22.4
	Moscow	12.1	7.2	5.6	20.2
Once in six months	Astrakhan	8.4	6.2	6.5	10.8
	Volgograd	8.9	5.3	7.5	14.6
	Moscow	10.4	8.8	15.1	7.9
Less than once a year	Astrakhan	6.8	6.2	14.8	7.2
	Volgograd	6.4	4.2	18.8	6.9
	Moscow	0	0	0	0
Never	Astrakhan	35.2	48.6	59.4	7.1
	Volgograd	21.1	40.4	58.5	10.2
	Moscow	28.8	44.2	45.1	5.7
Hesitate to answer	Astrakhan	6.9	9.3	6.6	1.8
	Volgograd	8.4	14	7.3	2.4
	Moscow	12.7	15.1	15.5	2.9

special style of people's thinking, programming languages also determine the appearance of a special computational, algorithmic thinking with its inherent skills of solving creative problems, critical analysis, and systematization [58–59]. Even “younger schoolchildren learning programming have an increased vocabulary, their speech becomes richer and more emotional”, creative abilities develop [60, p. 144].

During the second wave of the research, students were asked the question “How often did You create electronic programs in the last year?”. The level of students' information competence is showed by the fact that, when answering this question, there was the largest share of those who chose the option “never” (Tab. 5). Thus, 21.1% of Volgograd residents, 28.8% of Moscow students, 35.2% of Astrakhan students have never created electronic programs in their educational activities; 40.4%, 44.2%, and 48.6% have never done it in professional activities; 32.8%, 43.5%, and 44.3% have never done it in their everyday lives, respectively. 45.1% of Moscow students, 58.5% of Volgograd university students, and 59.4% of Astrakhan students have never created a website. A significant share (from 6.6 to 16% in various answers) of respondents found it difficult to answer these specific questions, even though it seems quite simple – you created it, or you did not. Judging by these results, Volgograd residents (there are more “techies” among them) more often create electronic programs, and students of Moscow universities – websites. However, even among techies, there is a significant proportion of those who have never done it in their lives, which raises questions about the compliance of universities' educational programs, material, and technical equipment to digitalization requirements. In general, according to the array of respondents, information competences of ICT creators are formed during certain activities only,

approximately, in every third case. At the same time, 16.5% of Astrakhan students, 9.5% of Volgograd students, and 18.5% of Moscow students process photos or videos every day.

Certain conclusions on students' information competences may be drawn on the basis of the analysis of students' responses to the question “For what purposes and how often do You use the Internet?” (Tab. 6). The most selected option is “for communication”: the share of this respond's selections noticeably increased among Astrakhan residents, and it even exceeded the number of selections of this respond by Volgograd residents. Moreover, the share of choosing the option “for leisure” significantly increased among Astrakhan residents (this share, as in the first case, is equal to the share of this option's selections by Moscow students), while, among Volgograd residents, this share remained unchanged. The same trend is observed in the share of selections of the answer option “for fun”: in Astrakhan, it increased and, in 2018, it was equal to the share of Moscow students' selection in 2019. In Volgograd, it increased slower, and it was inferior to the results received among Astrakhan and Moscow students.

Interesting results were obtained while analyzing the selection of the option “for information”: most often, this option was chosen by Moscow students; in Volgograd, the share of this option's selections decreased (although it was comparable to Moscow data in 2014), and, in Astrakhan, it remained unchanged. According to A. I. Voronov, when an overabundance of information (messages) occur, there is a desensitization of existence through a mosaic of information schemes-narratives. “The result may be the emergence of a class of adherents of information and gaming culture, the main leitmotif of which will be the idea of enjoying information” [61]. Thus, the researcher believes that a modern man was barely ready for the usage of electronic

Table 6. Students' responds to the question "For what purposes and how often do you use the Internet?" (% of respondents who chose the option "once a day and more often")

Option	Astrakhan		Volgograd		Moscow
	2014	2018	2014	2018	2019
For work	57.1	35.9 ↓	40.9	33.8 ↓	45.6
For studies preparation	69.8	60.3 ↓	79.0	71.4 ↓	63.7
For information	74.3	75.0	82.1	76.9	84.3
For professional development	34.3	26.3	26.8	25.3	36.6
For leisure	64.1	80.1 ↑	76.3	76.1	80.5
For communication	67.8	91.0 ↑	80.5	85.8 ↑	89.8
For electronic payments and purchases	6.1	24.8 ↑	8.6	20.2 ↑	33.5
For creativity (creating works of science, literature, and art)	14.7	15.5	11.9	14.9	23.2
For pleasure	51.4	75.5 ↑	60.4	69.6 ↑	74.3
For scientific purposes	11.0	17.9 ↑	20.1	16.9 ↓	26.3
For money investment	2.9	10.0 ↑	4.2	9.3 ↑	15.4
For expressing my opinion	н/д	16.7	н/д	13.3	23.2

information technologies, which offered "old as the world method of imitating the truth". He assumes that, in the near future and in the worst-case scenario, the formation of a new human Homo-medium will happen. It will be characterized by a depleted nervous system and internal impersonality, as well as a complete inability to put filters for incoming information [61].

According to O.M. Zotova and V.V. Zotov, overabundance of information leads to information overload which correlates among students "with symptoms of stress; it is especially indicated by the emotional and physiological component of stress. However, if an organism of a student still copes with the consequences of information overload physiologically, then, emotionally, there is an indication of stressful phenomena" [62, p. 108]. It should be emphasized that the problem of information stress has not yet been solved radically [63, p. 133]. Moreover, the term "information tsunami" becomes a metaphor that defines the new digital world [64, p. 16].

The decline of the frequency of the Internet usage for studies preparation in Astrakhan and Volgograd also requires further careful analysis. It should be noted that, in 2014, the share of

selections of this respond option in Volgograd was almost 10% higher than in Astrakhan. In 2018, Volgograd residents used the Internet to prepare for studies more often than Astrakhan residents did. It could be assumed that, in Moscow, where the best Russian universities and Russian students are centered, the share of selections of this respond option will be higher than in regional universities. However (this is one of the most surprising results of the survey), it just barely exceeded Astrakhan's results, and it was lower than Volgograd's results. It is extremely important for the analysis because it contradicts the logic of digitalization and the positioning of universities as centers of digital competences spread.

In Astrakhan and Volgograd, the frequency of Internet usage for work also decreases (most noticeably, in Astrakhan). According to the results of the second wave of the research, the share of students who chose this option, as well as the share of those who responded with the option "for professional development", is the highest in Moscow universities. It is interesting to note that, even in Moscow, only a little more than one third of respondents access the Internet once a day, or more often, for these purposes, while in Volgograd and Astrakhan –

every fourth person. However, in Astrakhan, this figure has significantly decreased since 2014, while it has remained unchanged in Volgograd. The question arises: what does a student understand by professional development, why does he / she not identify this process with studying at a university, getting a higher education that has ceased to be officially called professional?

We can also note that the share of Internet requests for electronic payments and purchases increased: in Astrakhan and Volgograd, one person out of four do it once a day and more often, and, in Moscow – one out of three. Students of higher education institutions in Moscow often go online to implement their creative potential – to create works of science, literature, and art. Among Astrakhan residents, the frequency of Internet access for scientific purposes increased, but the selection of this respond option is more common among Moscow students. They are also much more likely to use the Internet to express their opinion than people from towns of the Nizhne-Volzhskiy region. In addition, Moscow students are more likely to use the Internet to invest money, although the share of this option selection significantly increased in Astrakhan and Volgograd.

Conclusions

Thus, the contradictory impact of digitalization on various aspects of public life is shown. Challenges to the content of information competencies of young people in digital society are the need to form computational thinking with its inherent skills of creativity, critical analysis, algorithmization, programming. Successful capitalization of activities within digitalization requires the competence of an ICT creator. At the same time, a significant part of modern Russian young people, presented by its forefront – students, demonstrates a minimal level of digital literacy – the user level.

Features of information competences of this generation of young people are that, while choosing sources of information, most of them turn to the Internet, but the selection of the option meaning appeals to the primary social environment – parents, relatives, friends, and books (as carriers of meanings of traditional cultural forms) – is also actualized. Achieved results could be explained by the specifics of the studied “millennium” generation, which includes children who were born in the late 1990s–2002, and they are at the junction of two generations – Y and Z. On the one hand, researchers call these young people the “digital, post-television generation”, since they are of the same age as the official delegation of their own domains to individual countries [65, p. 358; 66, p.5]. On the other hand, the uniqueness of this generation of young people is that their primary socialization was conducted under the priority influence of a family and under the secondary influence of new mass media. It is clearly evidenced by the age of the first Internet and social network usage. Using the terminology of M. Prensky, this generation may be called digital migrants [67], who master the Internet language in the same way as migrants learn the language of a host country. They are unlikely to be able to fully use the ICT potential during their lives, their social capital is largely formed from other sources [67, 68].

Undoubtedly, features of socialization of studied generation explain a lot. However, the trend of the decrease of Internet logins for educational and professional activities with the increase of Internet logins for leisure and pleasure activities requires further careful study. After all, this trend may indicate dysfunctions of online education, which is an attribute of digital society [69, 70], and destructive manifestations of digitalization of Russian society.

It is possible to conclude that there is a significant discrepancy between challenges of digital society and information competencies

of a significant part of young people who demonstrate a minimum level of digital literacy – the level of a user, a consumer. It becomes clear that, in such situation, it is more necessary than ever to develop computational (algorithmic) thinking based on self-organization and self-education. One of priority areas is also the formation of electronic culture, which is an instrument of active involvement of a person in the process of digitalization based on a value-reflective attitude to ICT.

Thus, the practical significance of the research includes the analysis of information competencies of the forefront of youth – university students – on the basis of the study of digitalization’s contradictory challenges. The results may be used to predict the process of digitalization of modern Russian society. In addition, it is possible to use the results in the development of programs for advancing information competencies, forming electronic culture of students in the process of university studies. However, the substantive development

of methodological recommendations for the development of such programs is a different task which requires, first, the attraction of the potential of the administrative management apparatus.

Prospects of our further research are related to the analysis of information competencies of children, pre-youth, and adults in order to show the specifics of working with information in these age groups, to fix differences between digital migrants and digital natives using empirical methods. At the same time, the answer to the question concerning the scope of electronic technologies’ impact on goals, interests, and value orientations of modern young people remains open. In this case, technology may be called an external and often negative factor occurring in young people’s lives and activities. In another case, technologies will acquire the nature of an attribute, a social quality of modern youth, and information competences will give it opportunities for creative transformation of a life.

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