

THE IMPACT OF THE DIGITAL ENVIRONMENT AND INFORMATION OVERLOAD ON THE COGNITIVE STATE OF STUDENTS IN THE CONTEXT OF THE «ZHANA KAZAKHSTAN» PROGRAM

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Objective. The study seeks to examine how intensive exposure to digital technologies and excessive information flow affect learners' cognitive functioning, particularly attention, memory, and processing efficiency, as well as to evaluate potential risks to academic performance in highly connected learning environments within the context of the educational transformation under the «Zhana Kazakhstan» program.

Materials and methods. An empirical survey was conducted among 54 adolescents (mainly 17-18 years old). Data were collected through an 18-item questionnaire covering patterns of digital device use, distraction frequency, study habits, and self-reported cognitive states (focus, memory, concentration, and fatigue). The results were analyzed using descriptive statistical techniques to identify general tendencies and relationships.

Results and discussion. The findings indicate intensive daily use of digital devices, with a significant proportion of respondents (48.1%) spending more than six hours online. Many participants reported regular interruptions during study sessions and a tendency to switch between tasks. More than half (57.4%) experienced reduced ability to maintain focus, while a notable share (33.4%) indicated difficulties retaining recently learned material. Signs of cognitive strain, including tiredness and perceived overload, were also widespread. These patterns suggest a transformation in cognitive functioning characterized by reduced depth of information processing and increased fragmentation of attention. Within the framework of the «Zhana Kazakhstan» program, this creates a tension between digital advancement and the preservation of stable cognitive functioning.

Conclusion. The results demonstrate that excessive digital exposure is associated with cognitive strain, including weakened concentration and memory efficiency. However, students' awareness of these effects provides an opportunity to promote more conscious and regulated use of technology. Ensuring a balance between digital innovation and cognitive well-being remains a key challenge for modern education.

Key words: digital environment; information overload; cognitive processes; academic performance; university students; learning efficiency

INTRODUCTION

In the conditions of rapid digitalization of the 21st century, the educational environment has undergone fundamental changes. Modern learning is inextricably linked with the use of digital platforms, smartphones, and constant access to global networks. In the context of the implementation of the «Zhana Kazakhstan» program, digital transformation of education is considered a strategic priority aimed at enhancing human capital and ensuring the country's global competitiveness [1]. However, along with the expansion of educational opportunities, the problem of information overload has arisen – a state in which the volume of incoming data exceeds the adaptive capacities of the human brain, as described in contemporary research on cognitive load in digital environments by A. Skulmowski and K. M. Xu [11].

For students, cognitive processes such as attention, memory, and critical thinking are basic tools for mastering a profession. Their stable functioning determines not only academic performance but also the ability of the future specialist for continuous self-education. Within the framework of the «Zhana Kazakhstan» initiative, the development of these competencies becomes especially significant, as it directly relates to the formation of a competitive and intellectually resilient generation [1]. In this regard, studying how the digital environment transforms the cognitive profile of learners becomes a critically important task.

Previous research in the field of cognitive psychology and neurosciences confirms that long-term interaction with digital devices has a dualistic influence on the psyche. A number of authors point

to the phenomenon of «digital dementia» and a decrease in the depth of information processing. Thus, M. Spitzer, based on an analysis of modern scientific publications, introduced the concept of «digital dementia» and showed that excessive use of digital technologies is associated with a decrease in cognitive functions, primarily memory, attention, and thinking. It has been established that excessive consumption of information and active use of social networks can act as a risk factor for the deterioration of cognitive and emotional states, while the key problem is not the digital environment itself, but its irrational use [12].

At the same time, studies of the influence of information overload show that a constant flow of data and work in multitasking conditions lead to changes in cognitive processes. In particular, N. Carr notes that active interaction with the digital environment reduces the ability for long-term concentration and deep analysis of information [3], as supported by empirical findings on media multitasking and cognitive control received by H. T. Y. Yung, M. A. A. Bakar, K. A. Ghani et al. [14]. As a result, thinking acquires a more superficial character, and attention becomes fragmented, which negatively reflects on the efficiency of learning [3].

Despite this, the scientific community recognizes the positive sides of digitalization as well, such as the development of visual-spatial intelligence and skills for rapid information search. In particular, M. Prensky, in his concept of «Digital Natives», emphasizes that modern learners possess a unique ability for parallel processing of heterogeneous data and a high reaction speed [10]. Furthermore, studies by J. R. Flynn indicate that interaction with a complex technological environment is one of the factors of long-term growth in verbal and abstract intelligence indicators, known as the «Flynn effect» [5].

Despite the extensive base of research dedicated to general aspects of digitalization, the mechanisms of the influence of information overload specifically on students in the context of their professional formation remain not fully studied, as highlighted by W. Tafesse, M. P. Aguilar, S. Sayed et al. in recent work on digital overload as a cognitive stressor affecting learning efficiency [13]. This gap is particularly relevant for Kazakhstan, where the «Zhana Kazakhstan» program emphasizes the need for a balanced integration of digital technologies without compromising cognitive development. There is a deficit of data on where the line lies between the effective use of digital resources and the beginning of cognitive degradation under the influence of an excessive data flow.

In addition, adaptive strategies that learners develop to maintain cognitive homeostasis in an oversaturated information environment are insufficiently studied. The need to fill these gaps and determine the current cognitive status of modern students

in the context of the ongoing educational transformation under the «Zhana Kazakhstan» program led to the conducting of this study.

The aim of this work was the identification and analysis of the influence of the digital environment and information overload on key cognitive indicators of learners (attention, memory, information processing speed), as well as an assessment of the risks of decreased learning efficiency in conditions of hyper-connectivity.

MATERIALS AND METHODS

The practical part of the study was conducted using the survey method aimed at studying the influence of the digital environment on the cognitive state of learners. For data collection, a survey was developed, including 18 closed-type questions with answer options.

Adolescent respondents (predominantly 16-18 years old) participated in the study. The sample was formed on the basis of voluntary participation. The survey was conducted in an online format using digital platforms, which allowed for covering participants actively interacting with the digital environment. To assess the influence of information overload, the questionnaire included questions for evaluating the following parameters: the level of digital device use (time, purposes of use), frequency of distractions (notifications, checking the phone), features of study behavior (using the phone while performing tasks), as well as a subjective assessment of cognitive functions – attention, memory, concentration, and the level of mental fatigue. Processing of the obtained data was carried out using methods of descriptive statistics, including analysis of the distribution of answers and identification of trends characterizing the relationship between the intensity of digital technology use and subjective indicators of the cognitive state of learners.

RESULTS

54 respondents took part in the study, the majority of whom (87%) belong to the age group of 17-18 years, which allows for considering the sample representative for students.

An analysis of the time spent in the digital environment showed a high level of involvement: 48.1% of those surveyed use digital devices for 6-8 hours a day, 29.6% for 4-6 hours, and 14.8% for more than 8 hours. This testifies to a significant intensity of interaction with the digital environment (Figure 1).

The main purposes of using devices are social networks (93%) and studies (89%), which indicates a combination of educational and entertainment activity (Figure 2).

The results showed that the digital environment has a noticeable influence on the attention of learners. Thus, 37% of respondents noted that no-

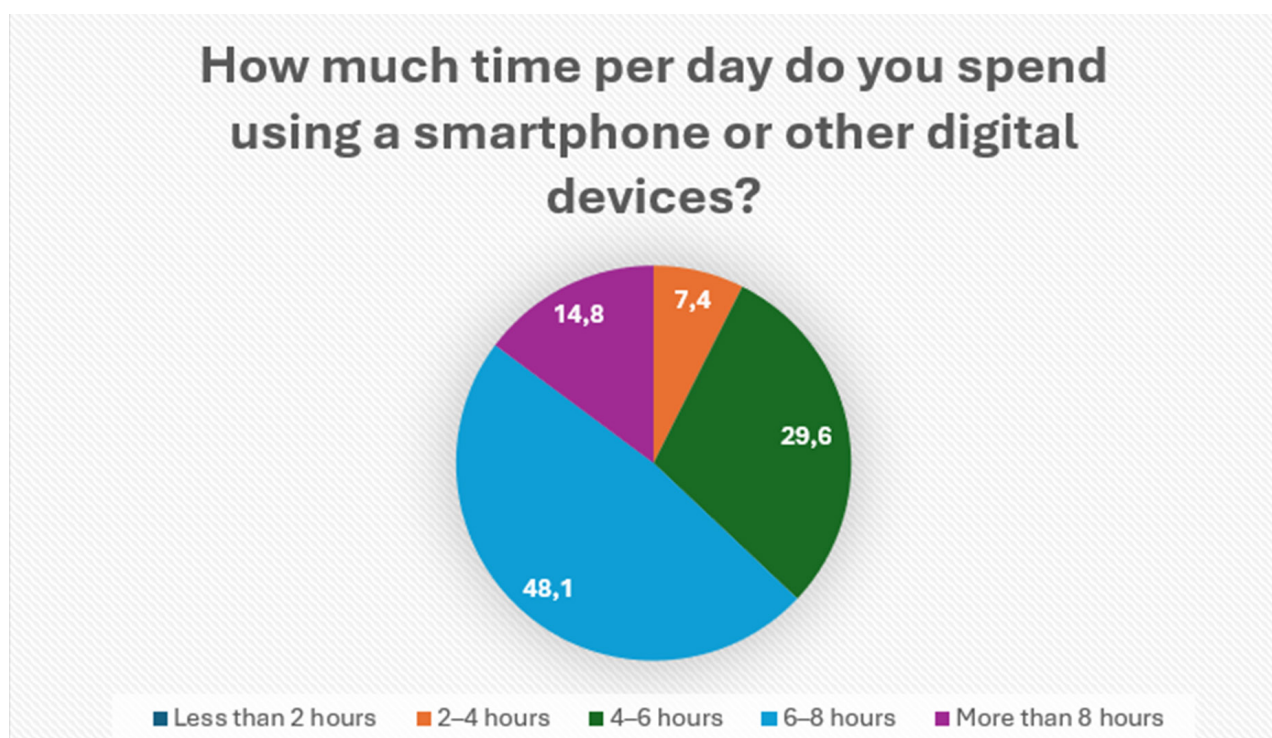


Figure 1 – Time spent on smartphones / digital devices

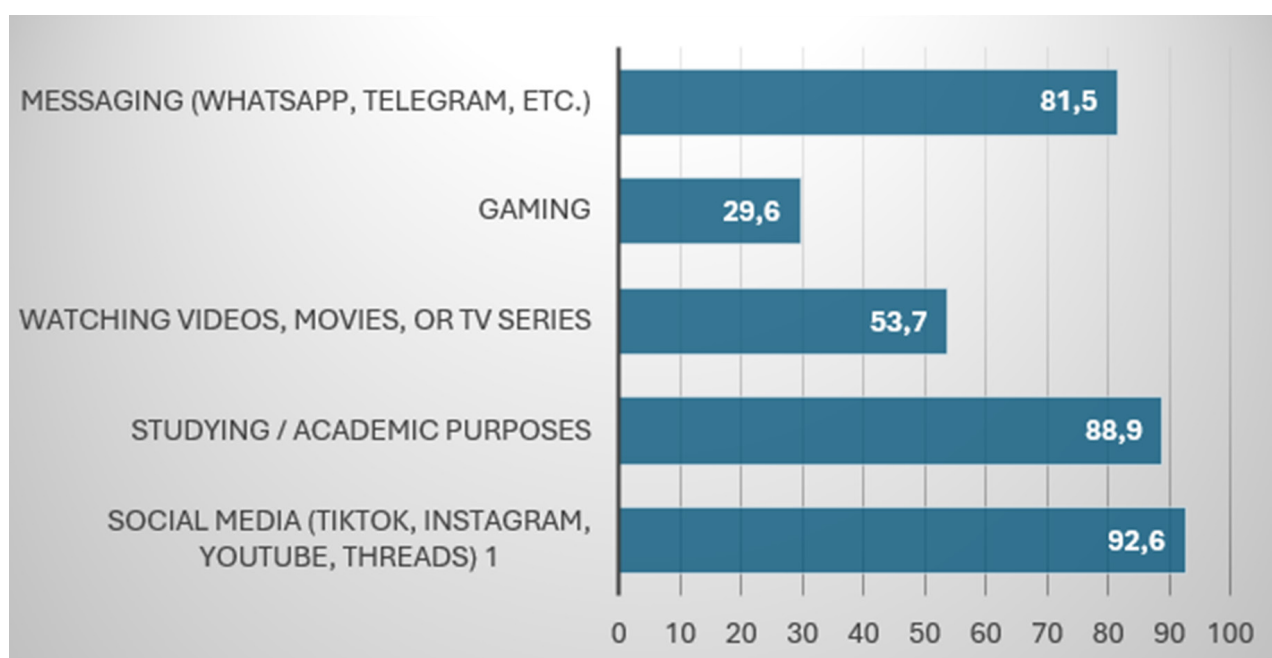


Figure 2 – Purposes of using devices

tifications sometimes distract them during studies, 20.4% – often, and 7.4% – constantly. At the same time, 46.3% of participants sometimes check the phone during studies, and 27.8% do this often, which confirms the prevalence of distracting behavior (Figure 3).

The assessment of concentration showed that 44.4% of respondents experience difficulties with concentration (sometimes difficult), 13% – pronounced difficulties, whereas only 31.5% believe that it is rather easy for them to focus. Despite this, 53.7%

of those surveyed indicated that they can concentrate for more than 40 minutes, however, a significant part (38.9%) – only 20-30 minutes, which may testify to a decrease in attention stability.

A subjective assessment of the influence of digital devices showed that 31.5% of respondents are sure of a worsening of concentration, and another 27.8% lean toward this opinion. An analogous trend is observed regarding memory as well: 16.7% noted a worsening of memorization, 18.5% – rather yes, how-

DO YOU FIND NOTIFICATIONS DISTRACTING WHILE YOU ARE STUDYING?

■ Never ■ Rarely ■ Sometimes ■ often ■ instantly

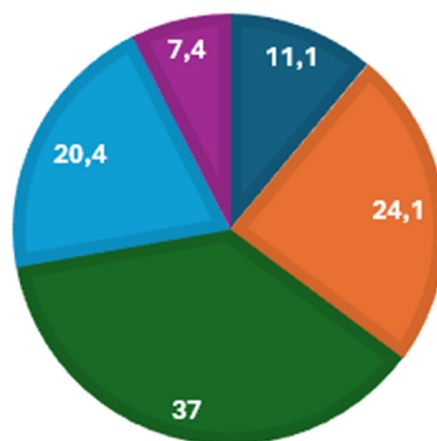


Figure 3 – Attitude towards notifications when studying

HAVE YOU NOTICED A DECLINE IN YOUR CONCENTRATION SPAN DUE TO PHONE USAGE?

■ Yes ■ Rather yes ■ Not sure ■ Rather no ■ No

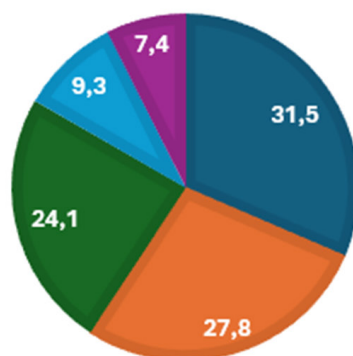


Figure 4 – Connection between phone usage and concentration

ever, 31.5% found it difficult to assess, which indicates the unconscious nature of the changes (Figure 4).

An analysis of the frequency of forgetting information showed that 40% of respondents sometimes forget recently studied material, and 33.4% – often or very often, which may testify to a decrease in memory efficiency.

At the same time, the attitude toward digital technologies remains ambiguous: 68.5% of those surveyed believe that they help memorization (33.3% – significantly, 35.2% – rather yes), however, 22.2% do not note an influence, and 8% believe that technologies interfere.

A significant part of the respondents notes signs of information overload. Thus, 31.5% sometimes experience mental fatigue, 27.8% – often or very often. The feeling of information overload is also common: 42.6% experience it sometimes, and 25.9% – often or very often (Figure 5).

Additionally, difficulties with information perception were identified: 29.6% of respondents sometimes experience difficulties when reading long texts, and 18.6% – constantly. Also, 35.2% of participants often or constantly notice a tendency to switch between different tasks, which indicates the development of multi-tasking and fragmentation of attention (Figure 6).

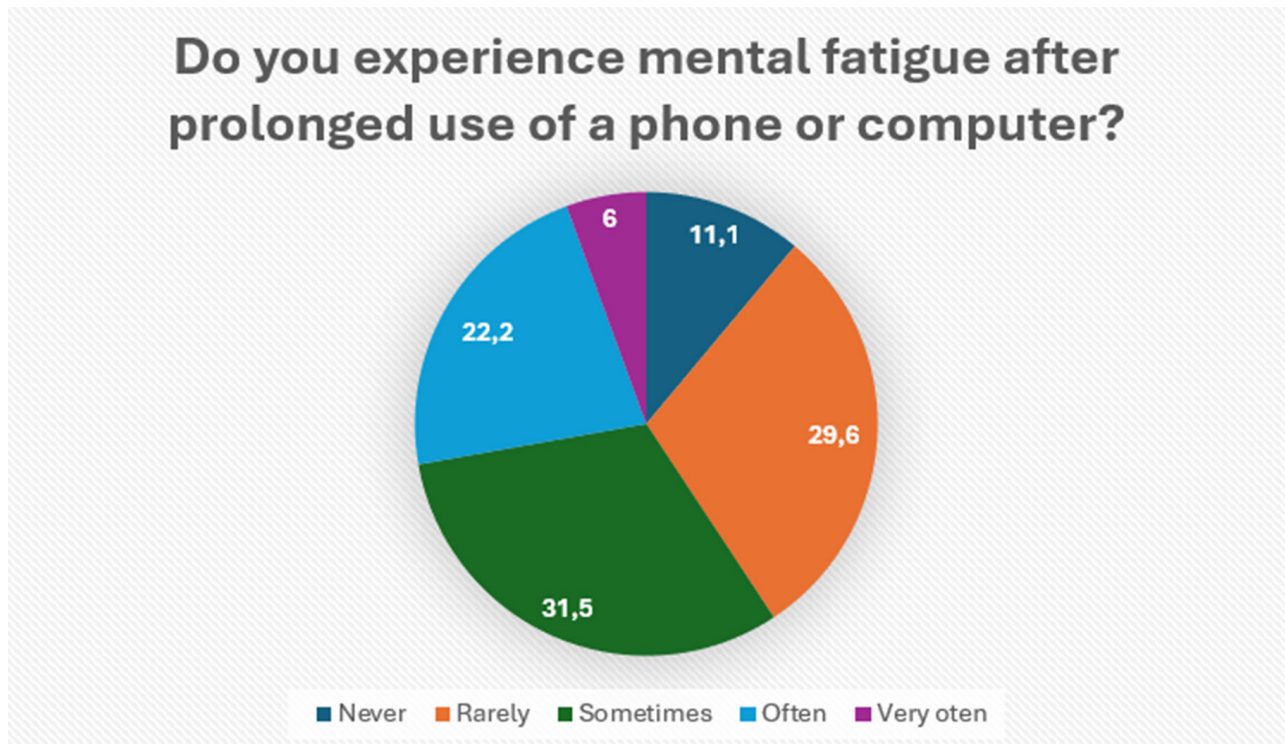


Figure 5 – Connection between phone usage and mental fatigue

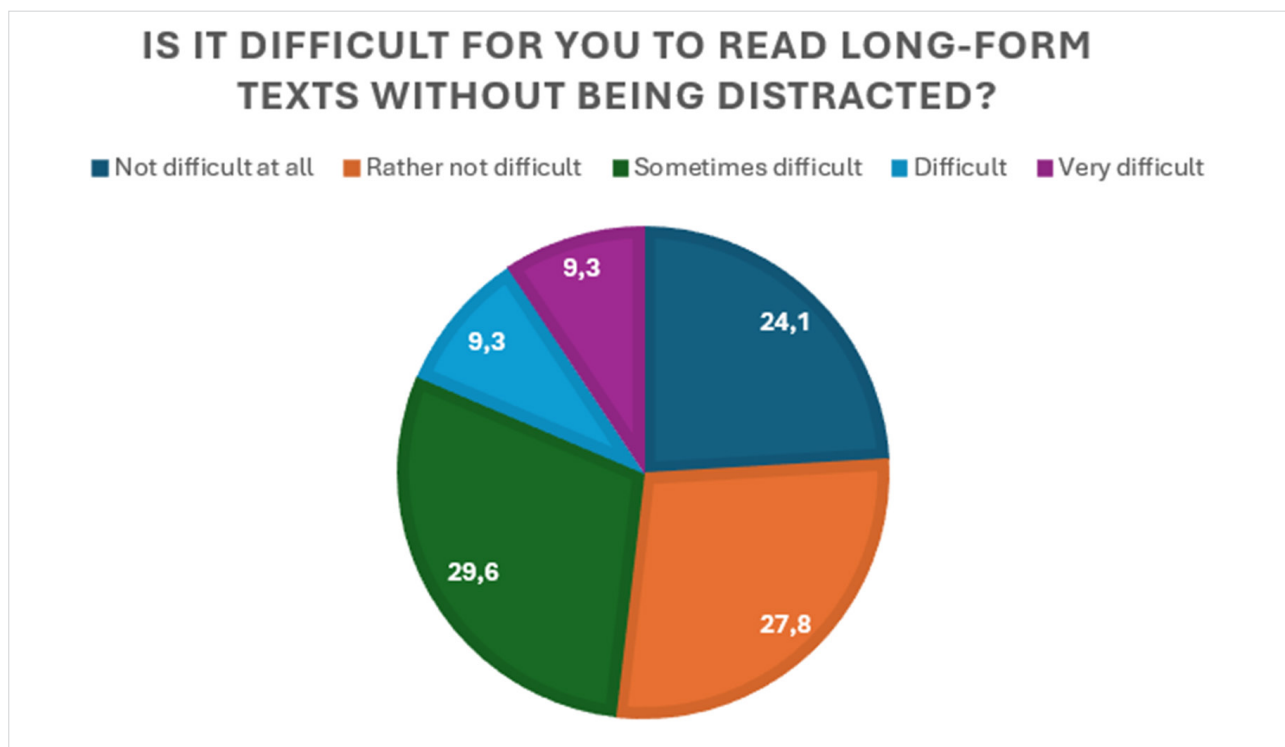


Figure 6 – Reading long-form texts and distraction

Despite this, the majority of respondents realize the problem: 42.6% try to limit device use, and 38.9% do this sometimes. At the same time, 68.5% of those surveyed believe that excessive use of digital technologies affects cognitive abilities (29.6% – yes, strongly, 38.9% – rather yes) (Figure 7).

Thus, the results of the study confirm that a high intensity of digital device use is associated with manifestations of information overload, a decrease in attention concentration, and signs of worsening memory, despite the continuing perception of digital technologies as a useful tool.

DO YOU BELIEVE THAT EXCESSIVE USE OF DIGITAL DEVICES AFFECTS COGNITIVE ABILITIES?

■ Yes, significantly ■ Rather yes ■ Not sure ■ Rather no ■ No

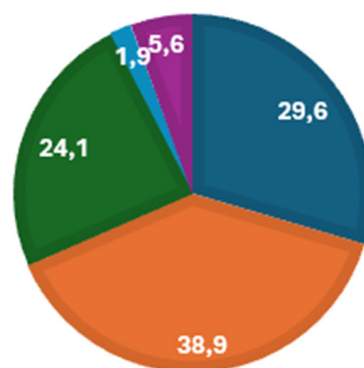


Figure 7 – Influence of excessive digital devices use on cognitive abilities

DISCUSSION

An analysis of the obtained data in the context of modern neurosciences allows for a deeper look at the transformation of the cognitive sphere of learners. Within the framework of the implementation of the «Zhana Kazakhstan» program, such transformations acquire particular significance, as the development of human capital and intellectual potential is defined as a strategic priority [1]. The fact that almost half of the respondents experience difficulties when reading long texts and are often distracted confirms N. Carr's theory of «fragmentation of thinking», as also supported by recent studies on digital reading and reduced deep processing in online environments carried out by R. N. Delgado, D. E. Allen, M. G. Keefe et al. [4]. N. Carr emphasizes that the digital environment accustoms the brain to «fast scanning» and constant search for new stimuli. As a result, neural pathways responsible for deep, focused reading weaken, while pathways responsible for processing scattered data fragments, on the contrary, strengthen [3]. We observe not just «laziness», but a physiological adaptation of the brain to an environment where speed is more important than depth. From the perspective of the «Zhana Kazakhstan» initiative, this shift represents a potential contradiction between the goals of digital modernization and the need to preserve deep analytical thinking skills among future specialists.

Confirmation of this is provided by the results of our survey on the decrease in memory (33% often forget material). Here it is appropriate to mention the study by L. A. Henkel on the «photo-taking impairment effect». She proved that when we delegate the function of fixing information to an external carrier (smartphone), the brain stops spending resources on its consolidation into long-term memory [6]. Our respondents, considering gadgets as helpers in

memorization, actually fall into the trap of «digital amnesia»: information is available in one click, but it is not incorporated into the structure of their personal knowledge. In the context of Kazakhstan's educational transformation, this phenomenon may limit the formation of sustainable professional competencies, which are a key objective of the «Zhana Kazakhstan» program [1].

The relevance of the problem intensifies when analyzing information overload. Studies in the field of cognitive neurobiology (for example, the works of E. Klingberg [7]) show that the volume of our working memory is extremely limited. When the flow of incoming data (notifications, social networks, studies) exceeds this volume, a state of «cognitive inhibition» arises. This explains why 31% of the students surveyed by us experience constant mental fatigue. The brain spends too much energy on filtering information noise, because of which practically no resources remain for high-quality solution of study tasks. For the «Zhana Kazakhstan» program, this indicates that increasing access to digital resources without regulating cognitive load may reduce the overall effectiveness of educational reforms.

In addition, the identified tendency of respondents toward multitasking (35%) causes particular alarm. A study by Stanford University (E. Ophir, C. Nass, A.D. Wagner) showed that people constantly working in multitasking mode actually cope worse with filtering unnecessary information and switch more slowly between real tasks. This confirms our hypothesis that the «digital dexterity» of students is only an appearance, behind which lies a decrease in the quality of cognitive processing [9], as also demonstrated by F. Kong, S. Meng, H. Deng et al. in their recent studies on media multitasking and attention control [8]. Within the strategic framework of the «Zhana

Kazakhstan» initiative, this raises the question of revising educational approaches: from encouraging multitasking toward developing sustained attention and cognitive control.

The novelty of this work lies in fixing the moment when learners begin to realize their vulnerability: 67% recognize the negative influence of technologies. This awareness is particularly valuable in the context of the «Zhana Kazakhstan» program, as it creates a foundation for the implementation of policies aimed at developing digital self-regulation and cognitive resilience, as highlighted in recent studies on digital well-being and self-regulation by M. V. Abeele [2].

In the future, it is necessary to study methods of adaptive learning that could use digital tools without overloading working memory. For Kazakhstan, this means designing educational models that align with the goals of the «Zhana Kazakhstan» initiative – integrating technology while simultaneously protecting cognitive health. The main challenge for modern education is to teach the student not to “absorb” information, but to consciously manage their attention, protecting it from an excessive flow of data to maintain the ability for critical analysis.

CONCLUSION

The findings of this study suggest that the modern educational ecosystem, despite its technological advantages, acts as a powerful catalyst in transforming the cognitive profile of students. Within the framework of the implementation of the “Zhana Kazakhstan” program, which aims to modernize education and strengthen human capital, these transformations represent both an opportunity and a challenge for sustainable cognitive development. The research identifies a critical paradox: while digital tools are perceived by learners as essential resources for development, their high-intensity use – averaging 6 to 8 hours daily – actually leads to the depletion of the brain’s adaptive reserves.

The synthesis of the theoretical concepts of «digital dementia» and the empirical data gathered reveals a qualitative shift in thought processes. There is a documented transition from deep, linear information analysis toward fragmented, superficial scanning. This is evidenced by the fact that nearly half of the respondents experience physical difficulty when engaging with long-form texts, and one-third suffer from a systematic failure to retain recently studied material. These phenomena point to the development of «digital amnesia», where the brain, relying on the instant availability of data, ceases to construct stable neural connections within long-term memory. From the perspective of the «Zhana Kazakhstan» initiative, such cognitive shifts highlight the necessity of balancing digitalization with strategies that preserve deep learning and analytical thinking skills among students.

Furthermore, the identified prevalence of informational fatigue is a significant concern. The states of cognitive inhibition and mental exhaustion reported by a substantial portion of students are direct consequences of irrational content consumption and constant task-switching. However, the high percentage of respondents who recognize the negative impact of gadgets on their cognitive abilities provides a necessary foundation for the development of conscious “digital hygiene”. This awareness is particularly important within the framework of the «Zhana Kazakhstan» program, as it supports the formation of self-regulated and cognitively resilient learners.

Ultimately, this work demonstrates that the primary challenge for the 21st-century student is not a deficit of information, but a deficit of attention. The preservation of a future specialist’s professional competence depends directly on their ability to build cognitive barriers against informational noise. Therefore, in alignment with the goals of the «Zhana Kazakhstan» initiative, the development of attention management skills and the protection of cognitive homeostasis must become an integral component of modern education, alongside the implementation of digital technologies.

Author contributions:

V. A. Burmistrova – concept and design of the study, processing of empirical data, text editing.

A .M. Zhagaltayeva – data collection, manuscript preparation.

Conflict of interest:

The authors declare no conflict of interest.

REFERENCES

1. *Новый Казахстан: путь обновления и модернизации: Послание Президента Республики Казахстан К.-Ж. Токаева, 16 марта 2022 г.* https://adilet.zan.kz/rus/docs/K22002022_1
2. Abeele M.V. Digital Wellbeing as a Dynamic Construct. *Communication Theory*. 2021; 31 (4): 932-955. <https://doi.org/10.1093/ct/qtaa024>
3. Carr, N. *The Shallows: What the Internet Is Doing to Our Brains*. New York: W.W. Norton & Company; 2010: 276.
4. Delgado R.N., Allen D.E., Keefe M.G., Leon W.R.M., Ziffra R.S., Crouch E.E., Alvarez-Buylla A., Nowakowski T.J. Individual human cortical progenitors can produce excitatory and inhibitory neurons. *Nature*. 2022; 601: 397-403. <https://doi.org/10.1038/s41586-021-04230-7>
5. Flynn J.R. *Are We Getting Smarter? Rising IQ in the Twenty-First Century*. Cambridge: Cambridge University Press; 2009: 1-310. <https://doi.org/10.1017/CBO9781139235679>
6. Henkel L.A. Point-and-shoot memories: the influence of taking photos on memory for a museum

tour. *Psychol. Sci.* 2014; 25 (2): 396-402. <https://doi.org/10.1177/0956797613504438>

7. Klingberg T. Training and plasticity of working memory. *Trends Cogn. Sci.* 2010; 14 (7): 317-324. <https://doi.org/10.1016/j.tics.2010.05.002>

8. Kong F., Meng S., Deng H., Wang M., Sun X. Cognitive Control in Adolescents and Young Adults with Media Multitasking Experience: a ThreeLevel Metaanalysis. *Educational Psychology Review.* 2023; 35: 22. <https://doi.org/10.1007/s10648-023-09746-0>

9. Ophir E., Nass C., Wagner A.D. Cognitive control in media multitaskers. *Proc. Natl. Acad. Sci. USA.* 2009; 106 (37): 15583-15587. <https://doi.org/10.1073/pnas.0903620106>

10. Prensky M.H. Sapiens Digital: From Digital Immigrants and Digital Natives to Digital Wisdom. *Innovate: Journal of Online Education.* 2009; 5 (3): 1. <https://nsuworks.nova.edu/innovate/vol5/iss3/1/>

11. Skulmowski A., Xu K.M. Understanding Cognitive Load in Digital and Online Learning: A New Perspective on Extraneous Cognitive Load. *Educational Psychology Review.* 2022; 34 (1): 171-196. <https://doi.org/10.1007/s10648-021-09624-7>

12. Spitzer M. *Digitale Demenz: wie wir uns und unsere Kinder um den Verstand bringen.* Stuttgart: Droemer; 2012: 367.

13. Tafesse W., Aguilar M.P., Sayed S., Tariq U. Digital Overload, Coping Mechanisms, and Student Engagement: An Empirical Investigation Based on the S-O-R Framework. *SAGE Open.* 2024; 14 (1): 1-14. <https://doi.org/10.1177/21582440241236087>

14. Yung H.T.Y., Bakar M.A.A., Ghani K.A., Hutasuht I.J. Digital Juggling: How Media Multitasking Affects Working Memory Performance Among University Students. *Journal of Cognitive Sciences and Human Development.* 2024; 10 (2): 73-86. <https://doi.org/10.33736/jcshd.7678.2024>

TRANSLITERATION

1. *Novyj Kazahstan: put' obnovenija i modernizacii: Poslanie Prezidenta Respubliki Kazahstan K.-Zh. Tokaeva, 16 marta 2022 g.* https://adilet.zan.kz/rus/docs/K22002022_1

2. Abeele M.V. Digital Wellbeing as a Dynamic Construct. *Communication Theory.* 2021; 31 (4): 932-955. <https://doi.org/10.1093/ct/qtaa024>

3. Carr, N. *The Shallows: What the Internet Is Doing to Our Brains.* New York: W.W. Norton & Company; 2010: 276.

4. Delgado R.N., Allen D.E., Keefe M.G., Leon W.R.M., Ziffra R.S., Crouch E.E., Alvarez-Buylla A., Nowakowski T.J. Individual human cortical progeni-

tors can produce excitatory and inhibitory neurons. *Nature.* 2022; 601: 397-403. <https://doi.org/10.1038/s41586-021-04230-7>

5. Flynn J.R. *Are We Getting Smarter? Rising IQ in the Twenty-First Century.* Cambridge: Cambridge University Press; 2009: 1-310. <https://doi.org/10.1017/CBO9781139235679>

6. Henkel L.A. Point-and-shoot memories: the influence of taking photos on memory for a museum tour. *Psychol. Sci.* 2014; 25 (2): 396-402. <https://doi.org/10.1177/0956797613504438>

7. Klingberg T. Training and plasticity of working memory. *Trends Cogn. Sci.* 2010; 14 (7): 317-324. <https://doi.org/10.1016/j.tics.2010.05.002>

8. Kong F., Meng S., Deng H., Wang M., Sun X. Cognitive Control in Adolescents and Young Adults with Media Multitasking Experience: a ThreeLevel Metaanalysis. *Educational Psychology Review.* 2023; 35: 22. <https://doi.org/10.1007/s10648-023-09746-0>

9. Ophir E., Nass C., Wagner A.D. Cognitive control in media multitaskers. *Proc. Natl. Acad. Sci. USA.* 2009; 106 (37): 15583-15587. <https://doi.org/10.1073/pnas.0903620106>

10. Prensky M.H. Sapiens Digital: From Digital Immigrants and Digital Natives to Digital Wisdom. *Innovate: Journal of Online Education.* 2009; 5 (3): 1. <https://nsuworks.nova.edu/innovate/vol5/iss3/1/>

11. Skulmowski A., Xu K.M. Understanding Cognitive Load in Digital and Online Learning: A New Perspective on Extraneous Cognitive Load. *Educational Psychology Review.* 2022; 34 (1): 171-196. <https://doi.org/10.1007/s10648-021-09624-7>

12. Spitzer M. *Digitale Demenz: wie wir uns und unsere Kinder um den Verstand bringen.* Stuttgart: Droemer; 2012: 367.

13. Tafesse W., Aguilar M.P., Sayed S., Tariq U. Digital Overload, Coping Mechanisms, and Student Engagement: An Empirical Investigation Based on the S-O-R Framework. *SAGE Open.* 2024; 14 (1): 1-14. <https://doi.org/10.1177/21582440241236087>

14. Yung H.T.Y., Bakar M.A.A., Ghani K.A., Hutasuht I.J. Digital Juggling: How Media Multitasking Affects Working Memory Performance Among University Students. *Journal of Cognitive Sciences and Human Development.* 2024; 10 (2): 73-86. <https://doi.org/10.33736/jcshd.7678.2024>

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ВЛИЯНИЕ ЦИФРОВОЙ СРЕДЫ И ИНФОРМАЦИОННОЙ ПЕРЕГРУЗКИ НА КОГНИТИВНОЕ СОСТОЯНИЕ СТУДЕНТОВ В КОНТЕКСТЕ ПРОГРАММЫ «ЖАНА КАЗАХСТАН»

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Цель. Исследование направлено на изучение того, как интенсивное использование цифровых технологий и избыточный поток информации влияют на когнитивное функционирование обучающихся, в частности на внимание, память и эффективность обработки информации, а также на оценку потенциальных рисков для академической успеваемости в условиях высокой цифровой связанности образовательной среды в контексте трансформации образования в рамках программы «Жана Казахстан».

Материалы и методы. Проведено эмпирическое исследование среди 54 подростков (преимущественно 17-18 лет). Сбор данных осуществлялся с помощью анкеты, включающей в себя 18 вопросов, охватывающих особенности использования цифровых устройств, частоту отвлечений, учебное поведение и субъективную оценку когнитивных состояний (внимание, память, концентрация, утомляемость). Обработка результатов проводилась с применением методов описательной статистики с целью выявления общих тенденций и взаимосвязей.

Результаты и обсуждение. Полученные данные свидетельствуют о высокой интенсивности использования цифровых устройств: значительная часть респондентов (48,1%) проводит в сети более шести часов в день. Многие участники отмечают регулярные отвлечения в процессе обучения и склонность к переключению между задачами. Более половины (57,4%) испытывают снижение способности к концентрации внимания, тогда как заметная доля (33,4%) указывает на трудности в запоминании недавно изученного материала. Также широко распространены признаки когнитивного напряжения, включая утомляемость и ощущение информационной перегрузки. Выявленные закономерности указывают на трансформацию когнитивных процессов, характеризующуюся снижением глубины обработки информации и усилением фрагментации внимания. В рамках программы «Жана Казахстан» это формирует противоречие между цифровым развитием и сохранением устойчивого когнитивного функционирования подрастающего поколения.

Выводы. Результаты исследования демонстрируют, что чрезмерное воздействие цифровой среды связано с когнитивным напряжением, включая снижение концентрации внимания и эффективности памяти. Вместе с тем осознание студентами данных эффектов создает предпосылки для формирования более осознанного и регулируемого использования технологий. Обеспечение баланса между цифровыми инновациями и когнитивным благополучием остаётся ключевой задачей современной системы образования.

Ключевые слова: цифровая среда; информационная перегрузка; когнитивные процессы; академическая успеваемость; студенты вузов; эффективность обучения

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«ЖАҢА ҚАЗАҚСТАН» БАҒДАРЛАМАСЫ АЯСЫНДА СТУДЕНТТЕРДІҢ КОГНИТИВТІК ЖАҒДАЙЫНА ЦИФРЛЫҚ ОРТА МЕН АҚПАРАТТЫҚ АРТЫҚ ЖҮКТЕМЕНІҢ ӘСЕРІ

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Зерттеу мақсаты. Зерттеу цифрлық технологияларды қарқынды пайдалану мен ақпарат ағынының шамадан тыс болуы білім алушылардың когнитивтік қызметіне, атап айтқанда зейінге, жадыға және ақпаратты өңдеу тиімділігіне қалай әсер ететінін анықтауға, сондай-ақ білім беру

ортасының жоғары цифрлануы жағдайында академиялық үлгерімге төнетін ықтимал тәуекелдерді «Жаңа Қазақстан» бағдарламасы аясындағы білім беру трансформациясы контекстінде бағалауға бағытталған.

Материалдар және әдістер. Зерттеу барысында 54 жасөспірім (негізінен 17-18 жаста) арасында эмпирикалық сауалнама жүргізілді. Деректер 18 сұрақтан тұратын сауалнама арқылы жиналды, ол цифрлық құрылғыларды пайдалану ерекшеліктерін, алаңдаушылық жиілігін, оқу мінез-құлқын және когнитивтік жағдайлардың (зейін, жады, шоғырлану, шаршау) субъективті бағасын қамтыды. Алынған нәтижелер сипаттамалық статистика әдістері арқылы өңделіп, жалпы үрдістер мен өзара байланыстар анықталды.

Нәтижелер және талқылау. Алынған нәтижелер цифрлық құрылғыларды пайдаланудың жоғары деңгейін көрсетті: респонденттердің елеулі бөлігі (48,1%) күніне алты сағаттан астам уақытын желіде өткізеді. Қатысушылардың көбі оқу барысында жиі алаңдайтынын және тапсырмалар арасында ауысуға бейім екенін атап өтті. Респонденттердің жартысынан астамы (57,4%) зейінді шоғырландыру қабілетінің төмендегенін сезінеді, ал едәуір бөлігі (33,4%) жаңа меңгерілген материалды есте сақтауда қиындықтарға тап болатынын көрсетті. Сонымен қатар когнитивтік жүктеменің белгілері, соның ішінде шаршау және ақпараттық шамадан тыс жүктелу сезімі кең таралған. Анықталған үрдістер когнитивтік процестердің трансформациясын көрсетеді, ол ақпаратты өңдеу тереңдігінің төмендеуімен және зейіннің фрагментациясының күшеюімен сипатталады. «Жаңа Қазақстан» бағдарламасы аясында бұл цифрлық даму мен өскелең ұрпақтың тұрақты когнитивтік қызметін сақтау арасындағы қайшылықты қалыптастырады.

Қорытынды. Зерттеу нәтижелері цифрлық ортаның шамадан тыс әсері когнитивтік жүктеменің артуымен, соның ішінде зейіннің төмендеуімен және жады тиімділігінің әлсіреуімен байланысты екенін көрсетеді. Сонымен қатар студенттердің бұл әсерлерді түсінуі технологияларды саналы және реттелген түрде пайдалануға мүмкіндік береді. Цифрлық инновациялар мен когнитивтік әл-ауқат арасындағы тепе-теңдікті қамтамасыз ету қазіргі білім беру жүйесінің негізгі міндеттерінің бірі болып қала береді.

Кілт сөздер: цифрлық орта; ақпараттық артық жүктеме; когнитивтік процестер; академиялық үлгерім; жоо студенттері; оқу тиімділігі