

SUSTAINABILITY OF SCIENCE IN A POST-COVID WORLD



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Greetings

Ladies and gentlemen, I present to you the monograph “The sustainability of science in a post-COVID world”, which is the start of a new intellectual integration project with our academic partners.

The digital breakthrough in the conditions of economic turbulence stimulated the risks that universities inevitably “accepted”, although they had not yet transformed their ideologies and had not managed to overcome cognitive barriers. Of course, network communication in the Internet will never replace live communication with a mentor, but it will be able to “build” trajectories of uniting University teams for innovative scientific research, implementing technological projects and attracting digital mentors from all over the world. Finding and working in such teams will definitely reduce the time needed to prepare digital projects, but there is a psychological risk of creating difficulties of trust and responsibility.

Against the backdrop of the economic crisis and turbulence associated with the COVID-19 pandemic, a decline in large-scale academic mobility is an inevitable trend. However, the number of academic migrants may increase due to the increasing difference in the responses of economies and management in higher professional education between developed and less developed countries, as well as the strengthening of General trends in economic integration. The psychological problem of scientific migration has become asynchronous, i.e. uneven, opportunities and adaptation to the new digital environment of University consortia and their implementation in practice.

The publication of the monograph “The sustainability of science in a post-COVID world” is a way for the Institute for Intellectual Integrations to bring together scientists in its pages to share some of the results of research and reflection on science. The pages of the monograph have been opened to all those who care about the process of intellectual integration and the possibility of coming together.



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Translated by Yaroslav Nahorni

Preparing students of pedagogical universities for work in a post-COVID educational environment with children with ADHD

Abstract. The article reveals the relevance of introduction of distance learning into the educational process, the challenges faced by Ukrainian education (from preschool to higher) in connection with the long period of quarantine. Attention deficit hyperactivity disorder (ADHD) is characterized and its symptoms are described. The definitions of the notions “distance education” and “distance learning” are given. The elements of the educational model “liberal arts and sciences” are described, which is based on the principles of flexibility and adaptability, and meets the social order in the post-covid educational environment and is designed to strengthen future teachers’ motivation to learn throughout life, teach them critical thinking, collaboration, creativity and communication (soft skills). It is found out that the proposed form is characterized by the flexible curriculum that combines the requirements of the breadth of disciplinary coverage with the depth of study of individual disciplines (courses), encourages interdisciplinarity, freedom of choice and organization of professional quasi-activity. The possibilities of using “Social Bubbles” in the conditions of post-COVID educational environment are concretized and specified.

Keywords: post-COVID educational environment, training of students, children with ADHD.

Topicality

In Ukraine, distance education is perceived as an innovation, but in 2013 the Regulation on distance learning was published [5], and the right of a person to receive education in various forms, including distance, is provided by the Law of Ukraine “On Education” (2019) [2]. The organization and implementation of distance learning is the subject of numerous scientific investigations of national and foreign researchers, in particular, V. Bondarenko, V. Kukhareiko [3], O. Mukoviz [4] and others.

However, despite the significant scientific achievements and legal support, the preparation of teachers for the organization of distance learning (during training in higher education institutions and at upgrade training courses), given the rapid development and emergence of new information technologies, needs to be improved.

First of all, it should be recognized that Ukrainian education for the first time faced challenges that are serious enough for all levels of education – from preschool to higher, in particular: presence of digital inequality between the participants of the educational process due to lack of comprehensive Internet access, necessary equipment and devices; general unpreparedness for distance education, due to the following factors: absence of methods, technologies and software for distance learning both for the students of higher education institutions and preschoolers; lack of skills to work in a team, group, collective and interact with others online; deepening of educational inequality between preschool children due to the lack of daily communication with educators (especially in kindergartens located in rural areas, as well as for children with special needs), etc.

Thus, pedagogues-practitioners during the forced transition to distance learning during the quarantine in 2020-2021 often had to study the functionality of platforms for organization of distance learning, often using the “trial and error method”, without solid theoretical knowledge, and thus immediately in practice, choose more convenient, effective and, most importantly, free options. All this required considerable time, which could not but affect the quality of the organization of the educational process. On the other hand, this situation allowed to gain valuable practical experience, which in the future will significantly improve the quality of education.

Unfortunately, we should state that there is a lack of researches on the impact of the pandemic on the mental and psychological health of children and adolescents. Quarantine measures during the pandemic

led to the high unemployment and deficiency of funds, especially for self-employed workers. According to S. K. Brooks et al., a long period of quarantine and restrictions on freedom of action are risk factors for serious psychological impact [11]. According to researches of G. Wang et al. [24] prolonged quarantine, fear of infection, frustration and boredom, lack of contact with peers, pedagogues and lecturers, narrowed or insufficient personal space at home, loss of loved ones cause serious psychological consequences for children and adolescents.

Scientific significance

In recent years in Ukraine, as well as around the world, the number of preschool children who have symptoms or diagnoses indicating developmental disorders is increasing. The most common are autism spectrum disorders, cerebral palsy, communication disorders (speech, pronunciation, social communication disorders), disorders of attention deficit and hyperactivity disorder (abbreviation in Latin – ADHD).

Symptoms of ADHD are usually observed in children from 3-4 years of age, and always – up to 7 years. Problems are especially acute in children aged 4-6, when the preschooler becomes more independent from adults, gets new responsibilities, prepares for the transition to the new stage of their life – schooling. In 2004, the International Association of Child and Adolescent Psychiatry and Allied Professions (IACAPAP) recognized disorder of attention deficit and hyperactivity disorder as a No.1 problem in the mental and psychological health of children and adolescents. Every year the number of children suffering from this syndrome increases. Analysis of the prevalence of ADHD suggests that 60% of adults who were diagnosed with childhood disorders (or were diagnosed as adults) have some problems with the syndrome [8]. Most researchers are inclined to believe that ADHD occurs worldwide and in all cultures. Researchers note that the manifestations of hyperactivity syndrome continue to persist in 70% of adolescents [8]. According to other researchers, this problem occurs in 2% of the adult population. In addition, it is much more difficult to recognize a hyperkinetic disorder in an adult than in a child. The frequency of ADHD in primary school children is 3-10% (there is even 28% data [1]). According to published data, in the United States the number of hyperactive children is 4-20%, in the UK – 1-3%, in Italy – 3-10%, in China – 1-13%, in Australia – 7-10%, in Ukraine – 12 % [14, 22].

The manifestation of the disorder is more pronounced in children in the age range of 6-8 years. According to world data, only 1/5 of the total number of hyperactive children comes to the attention of experts [22, 23]. The increase in the number of detected cases of children diagnosed with ADHD is associated by many authors with the growing awareness of this problem. According to official data from the Ukrainian Research Institute of Social and Forensic Psychiatry and Addiction of the Ministry of Health of Ukraine, ADHD is observed in 12.2% of schoolchildren, although there are other studies showing 28% of the child population in different countries [1].

In a research by J. Biederman et al. the relationship between indicators of Rutter's adverse conditions (including family conflict, social class, family size, maternal psychopathology and paternal crime) and ADHD, comorbidities and functioning was studied [9]. The authors concluded that low social class, maternal psychopathology, and family conflict were largely associated with psychopathology and functional disorders, with gender control, paternal ADHD, ADHD status, and maternal smoking during pregnancy.

Researchers J. D. Palacio-Ortiz et al. analysed current results on the impact of the post-covid environment on children and adolescents who have psychological problems, in particular suffering from ADHD [17]. The authors offered advice on the assessment of the state and treatment of children and adolescents with hyperactivity disorders and attention deficit disorder in the context of the COVID-19 pandemic, which was developed based on research and recommendations of the Royal College of Psychiatrists [20]. Against the background of the COVID-19 pandemic, an unprecedented crisis unfolded, which affected all spheres of public life, this is especially noticeable in developing countries. Thus, researchers L. Duan, G. Zhu [13] call a number of preventive measures to avoid infection with the virus – social distancing and isolation, which have a significant impact on the society. Such living conditions of children and adolescents in a post-covid educational environment require psychological, social and neurobiological adaptation, because their psyche is undergoing serious trials.

Training of students of pedagogical universities to work in a post-covid educational environment with children with ADHD has certain peculiarities. These peculiarities were taken into account by us during the introduction of elements of the educational model “liberal arts and sciences”.

Results of the research

Let's define that distance education is the content that is provided by a pedagogue/teacher and an educational institution for an applicant – from a preschool child to a student. Distance learning is a set of modern digital technologies that provide information delivery in the interactive mode through the use of information and communication technologies. Under the digital model of training students of pedagogical universities, we understand its differences from the traditional one. We see the main risk of “digitalization” of training of the future teachers in the extensive filling of the educational environment with digital technologies, understanding them only as a new name. However, we emphasize the significant differences in the principles of building the digital environment as “information and education”, namely in the focus on meeting the individual needs of each person. It is not a person who adapts to group (or standard) processes, but the process is built in the logics of the needs of each individual.

If we simulate the training of students in the post-covid educational environment, universities face a priority task – to provide educational logistics focused on each student according to individual needs, rather than within the study group, as is the case in the traditional model. Thus, emerging as elements of distance learning, digital learning through models of blended learning blurs boundaries, i.e. integrates the entire resource base of a higher education institution, and student training becomes holistic.

We proposed to use elements of the educational model of “liberal arts and sciences” at the university, based on the principles of flexibility and adaptability [10], which corresponds to the social order – the work of students, kindergarten teachers and university teachers in post-educational environment. Education in this model is designed to strengthen the motivation of the future teachers to learn throughout life, to teach them critical thinking, collaboration, creativity and communication (soft skills). The proposed form is characterized by a flexible curriculum that combines the requirements of the breadth of disciplinary coverage with the depth of study of individual disciplines (courses), encourages interdisciplinarity, freedom of choice and organization of professional quasi-activities [12, 15]. The proposed model was implemented by involving students in the interactive educational environment.

We used the following research methods: observation, comparison, generalization and experiment. The research consisted of several stag-

es: empirical study of the organization of students' work with children with ADHD under the conditions of distance communication (learning); development by the future pedagogues of a system of exercises of psychomotor loading and educational situations for preschoolers taking into account distance communication; analysis, description and generalization of research results.

We involved in the experimental work 28 kindergarten teachers (city of Vinnytsia) who work with children with ADHD in kindergartens and child development centres, as well as 28 fourth-year undergraduate students studying at a distance (Vinnytsia Mykhailo Kotsiubynskyi State Pedagogical University). It should be noted that the information offered by students was provided to parents, and they decided at what convenient time for them and the child this information (audio, video, texts of fairy tales, poems, examples of children's experimentation, play, art and other activities of children of early and preschool age) will be offered to their own child, taking into account his or her psychophysiological and emotional state. The parents were sent the recommendations of UNISEF and the Ministry of Education and Science of Ukraine "Children return to kindergarten" [6].

For educators of kindergartens and development centres, the introduction of so-called "social bubbles" was proposed, which are common not only in Asia but also in European schools [Pollak]. "Social bubble" is defined as a group of people with whom you have close physical contact. The peculiarity of the opening of schools in September is the division of children into small groups of "bubbles", i.e. children will learn and communicate in their small groups. In these groups children do not need to wear masks and keep distance. The groups will have individual schedule and break times, including lunch time. Thus, children will not have direct contacts not only between classes, but also within classes. If someone within the group falls ill, the whole group will be sent home. All teachers (and parents) will have to master tutoring competencies for individual pedagogical support of children's education [6, 19].

According to the recent study by the University of Oxford, the "social bubble" is a strategic way to combat the spread of the virus, limiting social interaction to a certain group of people. This interaction strategy is designed to gradually return to normal life, while limiting the transmission of the chain of infections [18]. The biggest fears among kindergarten teachers arose about whether preschoolers would be able to quickly understand how to behave in their "bubble", how to keep

their distance so that the “bubble” was intact and complete for longer. Of course, kindergarten teachers were quick to come up with ways to introduce bubbles, to bring children together, and so on. In our opinion, “social bubbles” can be considered as an option for working with children with ADHD. However, the “bubble” can be created only under the condition of observance of the known “magic number 7 ± 2 ” (other names – “Miller’s wallet”, “Miller’s law”). The psychologist George Miller on short-term human memory works in human resource management systems [16]. Thus, the number of children in the “bubble” can be from 5 to 9 people.

Beginning to prepare students to work with children with ADHD, teachers together with parents offered to introduce the child to the means of communication – to connect to Viber, WhatsApp, Skype, ZOOM, etc., try to have a conversation with acquaintances or significant adults (the father or the mother can be in another room), with other children, but not forcing, watching the daughter or son, helping to learn the rules of conduct and culture of online communication. And only then connect to communicate with the teacher. At first it was individual communication with the child, and later – connection to work in group. The results of studying the state of readiness of the future pedagogues to implement distance learning for children with ADHD in a post-covid educational environment indicate the predominance of the sufficient level of this readiness. A survey conducted among students and teachers of preschool education institutions confirmed the received results. The analysis of the results of the protocols made it possible to derive the averages for the levels presented in Fig.1.

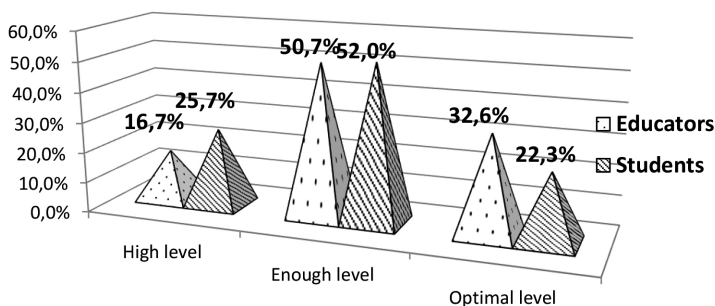


Fig. 1. Levels of readiness of the future pedagogues and teachers of preschool institutions to work with children with ADHD in a post-covid educational environment.

Thus, the level of readiness to work with children with ADHD in the analyzed groups was almost similar. The number of kindergarten teachers, who had the optimal level (32.6%), was more than students, almost 10% (students – 22.3%). This can be explained by the fact that under the conditions of sharp transition to online interaction, it turned out that some pedagogues do not have access to high-speed Internet, which made it impossible to interact with children through video conferencing services.

Most teachers of preschool education institutions have a low level of material support; they do not have the opportunity to purchase modern multimedia equipment (laptops, computers, smartphones, etc.). Other participants of the educational process faced typical problems: obsolescence or incompatibility of computer devices, use of unlicensed software, problems with settings for the proper functioning of devices, and so on.

It should be noted that the students of the Pedagogical University also faced the mentioned problems. Financial opportunities did not fully solve the problem of purchasing the necessary equipment and access to the Internet. Therefore, in our opinion, the data obtained on the sufficient level of readiness of kindergarten teachers (50.7%) and students (52.9%) are almost the same.

There are also significant differences in the indicators of high level between the future pedagogues (25.7%) and teachers of preschool education institutions (16.7%) by 9%, which is explained by the more active use of higher-end smartphones by young people. This allowed to conduct classes with children in the post-covid educational environment more effectively, actively using Viber, WhatsApp, Skype, ZOOM, interesting GOOGLE services that are accessible, free and easy to use.

Conclusions

The results of the conducted research confirmed and supplemented the already known developments, as well as contributed to the receipt of the new data on the problem studied. According to the results of the research, three groups of data were obtained: confirmed data (O. Slobodin et al.) on the development of physical and emotional states of children with ADHD; confirmed and expanded data (E.M. Bronfman) on the possibility and feasibility of using elements of the educational model “liberal arts and sciences”; concretized and specified the possibilities of using “Social Bubbles” (A. Pollak) under the conditions of post-cov-

id educational environment; the results of our research supplemented the conclusions of the scientists (L. Zdanevych, K. Kruty, et al.) on the effectiveness of the formation of competencies in the preparation of students.

The new results of the work include: substantiation of the digital model of training students of pedagogical universities; development of organizational and methodological support for training students to work in the post-covid educational environment with children with ADHD.

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