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Neuropedagogical Features of Communication in the Process of Online Education

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Abstract: *The article reveals the features of communicative interaction with students in conditions of quarantine restrictions and martial law. The aim of the study is to analyze the psychological issues of the organization of distance learning of adolescents and young people and determine, based on this, the main directions and technologies of pedagogical communicative interaction. The objectives of the study included the following features of the work: 1) determining the theoretical and methodological foundations of distance learning; 2) analysis of the main issues and psychological features of pedagogical-student communication in terms of distance learning; 3) elucidation of psychological and pedagogical ways and technologies of pedagogical interaction in the period of quarantine restrictions.*
The article presents the peculiarities of the educational process during the quarantine period as an aspect of neuropedagogy, defines the peculiarities of communication with children when using information and communication technologies. To study the processes of further immersion in the essence of brain behavior in the digital stream, the formation of new neuropedagogical knowledge is necessary to understand how to make learning and, more broadly, socialization a pedagogically controlled process in this new environment.

Keywords: *pedagogical communication, distance learning, learning platforms, teenagers, adolescence.*

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Introduction

Communication technologies, which are widely implemented in the pedagogical process, make it possible to maintain the pace and dynamics of educational activities in the context of restrictive quarantine measures caused by the global pandemic. The need to introduce distance education worldwide has become an urgent issue in the context of the spread of COVID-19. World educational organizations have initiated unprecedented alternative measures to receive educational services, including the closure of educational institutions and the distancing of education.

Biological adaptation of a person in a continuous Internet flow can occur both positively and negatively. Signs of a negative type of adaptation are presented: clip thinking, reduced need and ability to remember, Internet addiction, susceptibility to Internet manipulation, destructive physiological changes. The features of a positive type of adaptation on the Internet are also analyzed: virtual cognitive and educational activities; virtual game activity; virtual communicative and social activity. Positive traits are often closely bordered by negative processes of adaptation. The presented analysis substantiates the need for a new branch of pedagogical science - digital neuropedagogy, based on the methodological basis of neuropedagogy, which emerged at the end of the 20th century. An analogue is often found abroad - pedagogical neuroscience or, more broadly, cognitive neuroscience.

However, as the features of distance learning testing have shown, the unplanned and emergency transition to a digital communication platform has caused problems at all academic levels. Teachers faced a lack of information about distance learning strategies and practices. Students were not fully technically equipped for such education. During the implementation of the software, it became clear that innovative technologies need significant refinement and improvement, and the available communication resources do not always meet the requirements and psychological and pedagogical conditions of distance learning.

Studies of communicative interaction in the context of distance learning on a global scale have proved to be new and insufficiently implemented. Scientific research mainly concerned the testing of digital educational platforms (Goncharuk & Onufrieva, 2018) and pedagogical technologies of distance education (Zvinyatskivska & Kobernik, 2020). communication as a component of the educational process (Kirilenko, 2020), which determined the purpose of the scientific experiment.

The purpose of the study: to organize an experimental study of the psychological features of the organization of distance learning, elucidation of

psychological conditions and alternative psychotechnologies of reciprocal communicative interaction within the distance educational space.

Neuropedagogical features of communication in the process of online education

In the conditions of the new challenges of the new millennium, humanity faced global challenges caused by the intensive development of information and communication technologies. Digital transformations can with sufficient accuracy be called the business card of the third millennium. The transition to a digital civilization everywhere gives rise to new types of activities that require constant learning. The use of a computer, various digital devices is based on the use of various software products: from complex complexes for professional activities to simple small applications for the needs of everyday life, recreation and entertainment, as well as in the educational process. Today's education is mostly distance learning because of societal challenges such as covid-2019 and war. Therefore, there is a need to form effective communication between students and teachers. Digital transformations also affect the language of communication, in which there are new words that reflect life in the digital world. The concept of "continuing education" is undoubtedly also undergoing a digital transformation, taking on the features of the constant development of new types of online activities, new software products and, of course, new content. Temporarily leaving aside the quality of new information that is "swallowed" by the brain of a modern person, we note that cognitive activity on the Internet increases not only due to internal interest and inquiries, but also due to involuntary perception, which developers of new digital technologies pay great attention to (Sarancha et al., 2022; Tsymbal-Slatvinska, 2022; Nerubasska et al., 2020).

To analyze the ways of digital transformation of continuous education, let's consider the general picture of life in the new digital space. A model for this can be the idea that a person is in a continuous multidimensional digital flow (Maksymchuk & Sarancha, 2022; Sarancha & Kovinko, 2022; Nerubasska & Maksymchuk, 2020). This stream is not just a temporary immersion in digital reality, it is a kind of new constantly changing habitat, in which not only and not so much natural biological (life) needs play a decisive role. The activity of neural networks of the brain (often also the spinal cord) comes to the fore, which, processing sensory signals of a certain range, form a new reality for a person based on digital perception, imagination and even consciousness. Understanding that working with a computer on the Internet is a new reality, not a new idea. However, transformational processes do not stand still. Studies have shown a new

round of digital transformation - our teenagers are no longer just moving from one reality to another, they are living in a mixed reality. This process also aligns with the technical development of augmented reality glasses, which make it possible to easily connect the digital world with the real one. The stage when augmented reality glasses will become affordable and widely used devices, like, for example, a mobile phone, seems no longer in the distant future, but in the near present.

The example of new digital innovations in our study is not necessary to record the obvious fact of scientific and technical progress, but to pose the problem of how the human brain, thinking, and consciousness are transformed under the influence of a new digital or already mixed reality. Continuous digital flow is a new environment for human life. The human brain is constantly developing, adapting to new living conditions, developing. Digital or mixed reality is a new field of continuous learning of the brain, which forms a wide range of neural networks in response to rapid changes in external living conditions.

To approach the consideration of what is happening "inside", it is necessary to analyze in which digital reality or, in the digital flow, a person is.

The first approach is related to the idea of how human civilization enters the virtual digital Internet space. If there is a physical analogue, then a person is in a continuous flow of air. This does not interfere with his natural need to breathe, only breathing takes place in a continuously moving external environment. It is natural to believe that the longer a person stays in such conditions, the more the lungs will get used to the pressure difference and change. In the same way, inevitable changes occur in the human brain, which has been in the digital flow for a long time. The most important indicator of a person's immersion in the Internet space is the time spent in it. The Internet covers a large number of new users at the learning stage. These people spend less time online than active power users. But the process of educational immersion is continuous and after a decrease in the amount of time, there will be a cycle of its increase. Another important indicator for analyzing the state and change of a person in a continuous digital flow is the indicator of the speed of data flow in the Internet space. The speed of the connection means that for the time that a person spends on the network, he receives a greater flow of data. Biological adaptation of a person in a continuous Internet flow can be of a positive and negative type. We can conditionally distinguish two forms of spontaneous socialization on the Internet, which in their pure form, of course, are rarely found, usually it is a mixed version:

• clip thinking and reduced need and ability to remember;

- Internet addiction;
- susceptibility to Internet manipulation;
- destructive physiological changes (eyes, neck - back, small pelvis).

Snapshot thinking and reduced need and ability to remember. As we mentioned above, with the development of the "digital language" of communication in everyday life, new, rather capacious words that reflect the essence of new life in the digital space appear.

From the point of view of brain activity, this is the appearance of flashes of images that are not fixed in the form of a stable neural connection, but quickly fade and give way to others, similar to what happens in the clip. Internet content developers themselves actively help users by creating various short videos on various topics. A person, especially a young person, has the feeling that he "skipped" through the data and covered everything he saw or heard. But at the same time, he does not realize that the brain, which protects itself from excessive consumption of energy, does not spend it on fixing flash images in medium-term and long-term memory. Therefore, trying to reproduce information that would seem familiar and learned, a person is faced with the fact that he is able to describe only his feelings from the "residence". With the further increase in the flow of such clip information, it becomes increasingly difficult to force the brain to form a stable connection and consolidate information. To memorize the brain requires a rather time-consuming and tiring adaptation of learning. This is the neurophysiological root of the formation of Internet addiction. You can find a lot of scientific and journalistic materials about its manifestations and mass distribution. Addiction is one way or another connected with physiological pleasure, which is formed in the brain. The pleasure of "sliding" on bright, attractive in form and content information serves as a quick analogue of pleasure. With the apparent external harmlessness and availability, addiction begins to form. The subsequent transformation of a seemingly harmless addiction and fascination with the Internet into an addiction is determined by individual mental stability and predisposition. A person, being in a state of consciousness altered by virtual and mixed reality, gradually physically ceases to feel the reality of the danger of manipulative appeals, threats and life-threatening actions.

The positive type of adaptation on the Internet also has its own characteristics, which often closely border on negative adaptation processes:

- virtual cognitive and educational activity;
- virtual game activity;
- virtual communicative and social activity;
- professional activity on the Internet;

• Internet business.

The growing popularization of various types of online and Internet education contributes to the formation of an independent sphere of life on the Internet.

Full-time or even part-time education is associated with the acquisition of a whole range of types of real life experience. Therefore, knowledge has additional live emotional, volitional components, is associated with various life images, facts, etc. The results of virtual digital education are associated only with internal neuroprocesses, including emotional and volitional ones. The question of how differences in the outcomes of digital real education will play out now and in the future remains an open field for research.

This type of digital activity is one of the clearest examples of the boundary between positive relaxation, developmental, educational effect and addiction of digital games.

Virtual communication and social activities are a huge range of communication opportunities: from information exchange, organization of aid actions, support to social and even political speeches. But together with positive opportunities, negative ones are also growing rapidly. We are talking about the general dependence on virtual networks of the Internet, which supplant real live communication.

Theoretical and methodological bases of research of interaction with students at quarantine and martial law

The main means of communicating with children is communication. It acts as an intermediate link that connects two semantic fields of mutually oriented educational exchange. The primary task of pedagogical communication is to establish a full and accessible communicative exchange for children.

The most important in the learning process are business communications, which are aimed at productive cooperation by building partnerships to achieve learning goals. Such trends determine the relevant tasks:

1. Carry out a theoretical systematic analysis of scientific sources on the problem of experimental research.

2. To analyze the psychological features of pedagogical-student communication in the conditions of distance learning.

3. To find out alternative ways, conditions and technologies to improve the psychological support of academic interaction in the period of quarantine restrictions.

To implement the key tasks, a set of scientific research methods was used: theoretical: analysis, comparison, generalization, systematization; empirical: questionnaire, standardized survey. The obtained data were processed using statistical methods. The material was tested on an experimental sample of adolescents and young adults.

Business communication involves the implementation of several conditions (Grigorieva, M. S., 2015):

1) involvement of all participants in the interaction, regardless of their views and positions;

2) subject-targeted orientation of communication;

3) formal role distribution of responsibilities;

4) focus on achieving a common end result;

5) the presence of communicative control.

During the educational process, these conditions are realized by means of mutual direction, where communicative partners are always the subjects of information exchange aimed at achieving a common goal.

Today, remote communicative interaction has many areas and benefits. These are video conferencing (8x8, Any Meeting, Discord, Free Conference, Google Meet, GoToMeeting, IPVideoTalk, Jitsi, LifeSize, Proficonf, Skype, UberConference, Zoom), modular learning environments and web-based learning management systems (Moodle, Google Classroom, ATutor, Edmodo), correspondence via e-mail, text chats and other software services.

These learning platforms are widely used to establish business contacts. They help to organize real-time communication, conduct online conferences using high quality video, organize forums, invite participants, discuss, share information, record conversations, make presentations, evaluate, conduct online testing.

Distance learning as an effective tool for adolescent technology development

The aim of the study is not to develop an algorithm for the use of remote digital technologies in working with children, but to determine the psychological needs of adolescents and young people in the period of limiting their real communications. It is especially important to find out the psychological problems that need to be addressed in the context of distance learning. Based on the study of theoretical and methodological principles of distance learning and in order to clarify the most important student requests, a study was conducted that identified the main psychological problems in the period of quarantine restrictions.

All others include emotional problems (emotional instability, insecurity, emotional stress, fear and anxiety) and mental and physical health problems (anxiety about the health of relatives, loss of physical fitness). Quantitative interpretation of the results is reflected in the following sequence (from the most to the least significant): communication problems - 42.6%; organizational problems - 38.1%; emotional problems - 13.5%; psychophysical development and health problems - 5.8% of respondents.

Its **first stage** involves a questionnaire, which tracks the factors of psychological mal adaptation during quarantine restrictions. Pupils and students were not asked to clarify and have ready answers, as this could subconsciously direct them in the necessary direction. They responded independently, highlighting their own emotional attitude to the problem. To correct the obtained data, the content-response analysis is performed. According to the results of the survey of 155 young people and pupils, the following group of problems was identified (see Fig. 1):

I. Communication problems– reflected in the answers of 66 children (42,6%):

1) lack of communication (26,5%);

2) social accessibility and closed length (9,7%);

3) closed places for communication (youth cafes, interest groups) (3,2%);

4) difficulties in learning new material without explanations from the teacher (3,2%).

II. Problems of organizational nature - presented in the answers of 59 people (38,1%):

1) technical features of the training services: due to the inability of the participants of the training platforms (12,3%) during the performance of the work;

2) lack of technical equipment for distance learning: not everyone has a laptop, many students use their smart phones which are not suited to the task (3,2%);

3) spending an excessive (by medical means) amount of time on the computer in order to fulfill educational tasks (7,1%);

4) disorganization of the educational space: some educational tasks take more time to execute than the planned one academic hour; it is difficult to digest the material on one's own (7,7%);

5) increasing laziness, procrastination and other problems related to disorganization and lack of educational control (7,7%).

III. Emotional problems – reproduced in 21 answers (13.5%):

1) emotional instability (3,9%);

2) uncertainty in actions (2,5%);
3) fear and anxiety (3,2%);
4) emotional stress (3,9%);

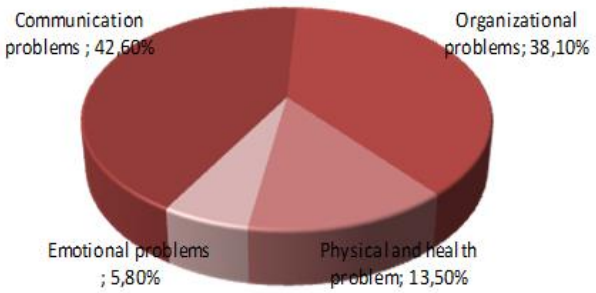

Fig. 1. Distribution of factors of social and psychological mal adaptation by psychological issues (developed by the authors)

IV. Problems of psychophysical development and health – were found in the answers of 9 subjects (5,8%):

1) anxiety about the health of relatives (2,5%);
2) loss of one's own form or decrease in physical activity (2,5%);
3) irritation that not everyone adheres to the mask wearing regime (0,6%);

As the results show, the problems of communicative interaction are of primary importance for pupils and young people. They were expressed differently, but had the same meaning: «lack of communication», «lack of live communication», «difficult without communication with friends», «communication problems», «have not seen friends for a long time» – here is a short excerpt from the answers of students. It should be emphasized that communicative interaction is important for pupils and young people, and its limitation often contributes to the emergence of various forms of social maladaptation. No wonder students in these age categories highlight the problems of communication as the most painful, and the need for communication as the most significant in the period of quarantine restrictions. They need more detailed consideration and elaboration.

Psychological research shows that communication problems are associated with two main forms of communication: business and personal. A survey of pupils and students showed that difficulties in business communication concerned the use of platforms that did not involve direct video contact and limited communication with teachers. For example, the

Moodle system is intended only for the creation of electronic courses (Kirilenko, T. S., 2007). It has many advantages: it provides the opportunity to present educational material in various formats, to monitor educational activities, but does not provide explanations and consultations of teachers in video mode, which complicates the assimilation of the material.

It should be understood that the leading channels of information perception of pupils and students may be different (Krysko, 2021). Among them there are more who rely on visual channels of perception. However, audio channels, which consist in the cognitive ability to process new information by ear, are also formed in many listeners. Verbal motivation, accents in the presentation of the material, voice modulation, intonation, tempo and emotionality of speech are important for the audience. Many distance learners point out that the lack of lively question-and-answer discussion imposes significant limitations. In view of this, it is important to use different platforms for the presentation of educational material, which provide both visual and audio perception of information. It would be great to combine these forms of information perception in one learning platform, which is a recommendation for developers of digital learning services.

In addition to business communication, personal communication is important for pupils and students (Paul & Bodyk, 2019). If we accept all the problems of communicative interaction described by the participants of distance learning for 100% (66 answers), then among them personal problems were found in 61 cases (92.4%), and problems related to business communication - in 5, which is 7.6%. This can be traced on the schedule (see Fig. 2):

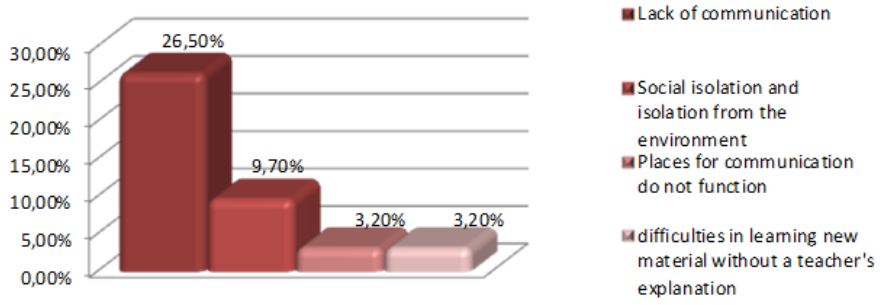

Fig. 2. Differential analysis of problems of communicative interaction during quarantine restrictions (developed by the authors)

According to the diagram, participants in the educational process are concerned about the lack of interpersonal communication with peers (26.5%), social isolation and isolation from the environment (9.7%), inability

to visit places for youth communication, which are closed during quarantine restrictions (3.2 %). Given that the educational process is not only education but also personality-oriented education, and the majority of children with interpersonal communication needs, we should pay attention to the development of communicative forms of personality-oriented interaction between adolescents and young people (Shvets, 2021). This is usually done by planning group educational activities during the period of quarantine restrictions, which, for the time being, has been left out of the distance of the distance learning process.

Equally important issues of distance education were organizational problems, which were presented in the answers of 38.7% of adolescents and young people (Shchetko, 2020). The first of them is the insufficient technical organization of the educational space. Much of this is due to the technicalities of using educational platforms. Young people and teenagers often name the following problems: "not everyone can or wants to connect to video during video conferencing", "microphones do not work", "there are problems with the Internet during the lesson, which depend on the Internet provider (lack of Internet access)) or recipient of educational services (late payment, local light problems, etc.)","there are technical problems with access to the Internet during testing, independent work or exam, which reduces the academic grade", "problems with registration of participants or connection to the group","disabling training services for unknown reasons", etc.

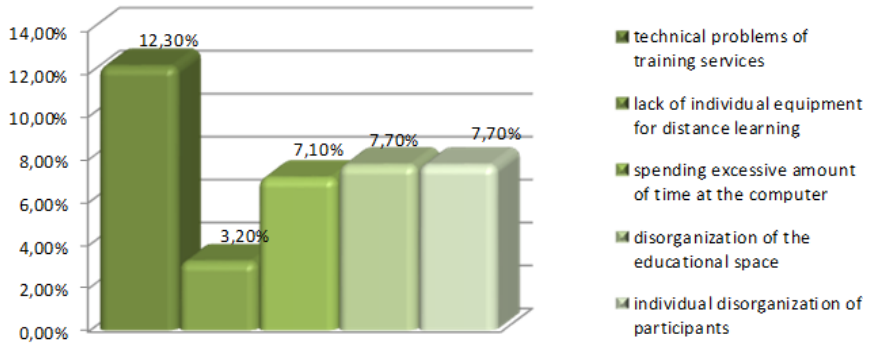

Fig.3. Differential analysis of organizational problems during quarantine restrictions (developed by the authors)

An equally important problem is the lack of technical equipment for distance learning for some participants in the learning process (3.2%) (see Figure 3). It should be noted that not all children are brought up in

prosperous, full and well-off families, so not all of them have technical equipment for distance learning (Yurinets Z. V., Makara O. V., 2014). In particular, many students use phones that are limited in many functions.

Among the organizational difficulties are those that do not depend on the technical organization of educational platforms, but on the actual pedagogical organization (7.7%). They recognized: a) unregulated educational tasks in time; b) allocating excessive amounts of time to perform educational tasks in an independent mode.

Regarding the first point, it should take into account the psychological aspects of mental capacity, the amount of material to remember, the peculiarities of the perception of educational material, etc. (Behncke, S., 2009). For example, increasing the time to complete tasks by more than 1 hour (with 6 lessons per day) would be a violation of working hours for minors (6 hours per day). Given the amount of verbal mechanical memory, which is up to 10 units, it is desirable to offer the amount of educational material within this norm. For example, memorizing more than 10 new words from a foreign language, or more than 10 new terms from physics, math, or biology can be challenging for learners.

The following organizational difficulties include spending a significant amount of time on the computer to complete learning tasks. 7.1% of participants are inclined to this opinion. Staying online for 6 hours is an excess not only for children but also for adults. This is emphasized by physicians, who regulate the following standards for children: 10-12 years - 2 hours a day, 13-14 years - 2.5 hours, 15-16 years - 3 hours (Beilock, 2010). Instead, educators plan all academic hours using distance learning technologies, which is undesirable for children's health.

According to a survey of pupils and students, the next problem in organizing their learning is the lack of ability to work on learning tasks independently - without explanations from the teacher (Bol T., 2020). Teachers, having a high level of pedagogical skills, previously offered students specific techniques that helped to better master the material. Among them, key messages, methods of associative memorization of material, techniques of mnemonics and eidotechnics, interactive presentations, business games, debates, brainstorming techniques, research mini-projects, creative contests, problem-based learning, games-competitions, etc. (Bulman & Fairlie, 2016). However, during independent work, these pedagogical techniques cannot be fully implemented, which complicates the assimilation of educational material by children.

This approach, as well as some psychological features of volitional development, characteristic of adolescents and young people, are becoming a destructive basis for the growth of psychological problems associated with

disorganization of learning activities and behavior in general. Adolescents and students indicate an increase in laziness, procrastination, violation of goal-setting (7.7%).

The reasons for this are various factors. Analyzing the factors of subjective self-organization of the individual demonstrates their connection with the dysfunction of such volitional and emotional qualities as willpower, resilience, firmness, activity, composure, organization, perseverance in achieving the goal. Their insufficiency causes disruption and a gradual increase in disorganization. Many researchers point to the reasons for the lack of external control. Thus, scientists V. Paul, O. Bodyk (2019) state the fact that in the experimental group, where children work under the guidance of an adult, the number of children with a high level of volitional behavior increases from 0% to 73%. Improvement of results was determined by indicators of persistence (ts = 11.80, p <0.001), self-control (ts = 7.90, p <0.001) and performance evaluation (ts = -8.09, p <0.001).

The next destabilizing factor in distance learning was emotional problems, which were reflected in the responses of 12.9% of adolescents and young people. Among them are emotional instability, uncertainty in their actions, fear and anxiety, emotional tension. The positive thing about this list is that the fear and anxiety about the pandemic is manifested in a small number of children (only 2.5%), which indicates that they are less concerned about it. Slightly more participants are concerned about emotional instability (3.7%), insecurity (3.1%) and emotional stress (3.7%) regarding the situation with COVID-19.

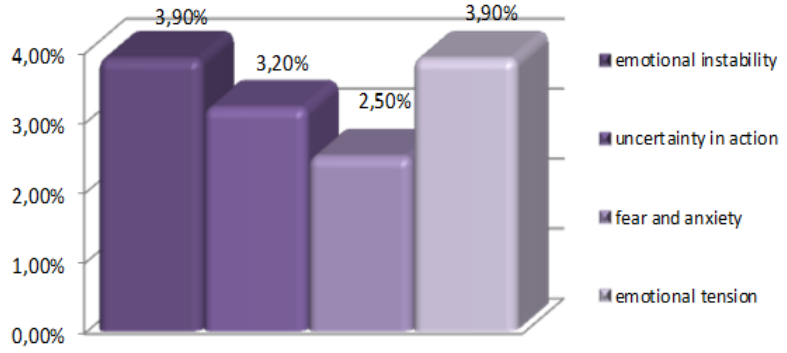

Fig.4. Differential analysis of emotional problems during quarantine restrictions (developed by the authors)

Scientists attribute the causes of emotional instability in adolescence not only to stressful situations, which revealed quarantine restrictions, but also to the peculiarities of puberty and hormonal changes in the body

(Kirilenko, 2007). It is at this stage of child development that there is a peak of emotional imbalance, and any stress can cause exacerbated emotional reactions (Grigorieva, 2015). They turned out to be quarantine restrictions for children. Stressful reactions to them were observed in 13.5% of people.

Our experimental data are supplemented by other analytical studies, the results of which showed that the perception of the threat of COVID-19 is associated with negative affect and some destructive emotional states. Thus, scientists (Escueta M., 2017) have experimentally proven the existence of a direct positive effect of perceived threat on the emergence of emotional states of depression, sadness, anxiety and anger-hostility. They pointed to the existence of circular relationships in which the perceived threat affected the presence of a negative mood, and a negative mood contributed to the feeling of threat.

In the context of pedagogical communicative influence, the feeling of uncertainty and tension must be changed to a stable position and confidence in human resources aimed at overcoming the pandemic (Falck & Woessmann, 2018), need targeted pedagogical influences, which can be motivational attitudes, focus on social activity and emotional stability.

The social changes associated with the isolation process during the quarantine period have identified another group of problems that are equally important for adolescents and young people. They have manifested themselves in responses related to physical and mental health. These problems have become significant for a small number of participants in the remote process (only 5.8%), but their relevance has not decreased. Among the main psychophysical problems - anxiety about the health of relatives (2.5%); reduction of own physical activity (2.5%); irritation that not everyone adheres to the mask regime (0.6%) (see Fig. 1).

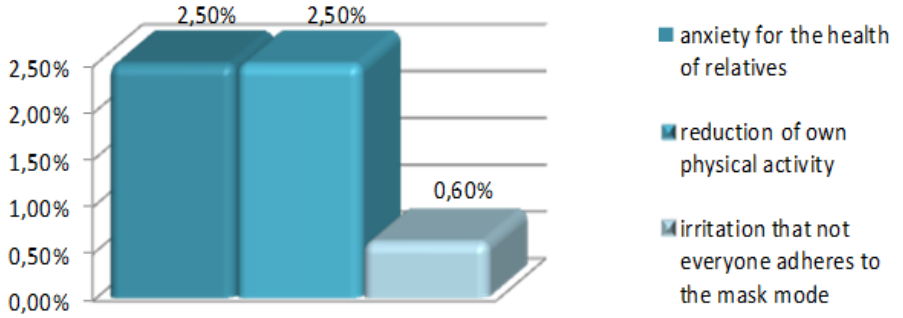

Fig.5. Differential analysis of psychophysical problems during quarantine restrictions (developed by the authors)

As we can see from the table, this group of psychological problems is the least represented in pupils and young people. None of them

mentioned worrying about their own health as a typical response. This is due to the fact that congruent ideas about their own health in pupils and young people are based on the needs of a healthy lifestyle, which are realized in this age range (Zheleva, 2014). On the other hand, they expressed concern for the health of relatives, which is associated with a clear understanding of the differences between the potential of their own health and the health of older people. The psychophysical condition of significant adults is potentially disturbing.

So, finding out the psychological problems of adolescents and young adults during quarantine restrictions allowed us to state that they are most concerned about communication problems and organizational problems psychophysical development and health.

Features of formation of adaptive forms of educational behavior in pupils and students

Determines the direction of pedagogical communication needed to overcome these problems. Teachers are responsible for the mental state of participants in the educational process, so their influence should be focused on the formation of adaptive forms of learning behavior in pupils and students.

The first direction of pedagogically oriented communication is overcoming the difficulties of communicative interaction associated with self-isolation

Establishing business communication related to the acquisition of knowledge involves the use of various educational services and certain innovative technologies of pedagogical influence. One of them is the technique of abolished teaching presented by Italian scientists (didatticacapovolta). Inverted didactics in the concept of Flipper Classroom involves the abolition of accepted notions of the distribution of school time. Basic activities, such as listening and memorizing, are performed at home by pupils and students who receive educational videos. Instead, class time is devoted to discussions and group learning. The teacher becomes an educator who monitors and coordinates the work of children (Heckman J., 2014). Another method presented by Italian scientists is metacognitive learning communication, aimed at developing cognitive, strategic, and self-regulating skills that help improve learning strategy and better manage emotions. This communicative strategy focuses on the theory of cognitive influence, which involves the construction of conceptual and technical maps of learning activities, activation of self-management of participants in the

learning process, semantic and heuristic aspects of communication (Khazan O., 2020).

The method of argumentative learning presented by French researchers may also be suitable for distance learning. Such educational communication develops in students the skills of scientific reasoning to activate their logical development, the ability to substantiate or refute statements. Educators teach the ability to analyze opposing ideas, compare, provide evidence, engage in constructive discussion, encouraging students to ask open-ended questions, reformulate their comments in more scientific language, refine their opinions, and use models to construct explanations.

Entertainment education strategy is quite useful in distance. Multimedia educational programs can also be a promising tool in terms of their simplicity and accessibility. With the development of electronic media, there is an opportunity for mass integration of educational information into entertainment programs. Today, such education is recognized as an important communication strategy used around the world. Educational films and video series, interactive game activities are educational information that can be integrated into any educational process.

In the time of scientific and technological progress, the research method of communication becomes relevant (Kuhfeld & Tarasawa, 2020). It allows to demonstrate the essence and properties of things through scientific experiments, reach a general conclusion on the basis of step-by-step specific judgments. The virtual learning environment creates the conditions and motivational basis for research, describing the proposed algorithm of action and the expected hypotheses. It provides the ability to remotely perform practical work, managing remote laboratory experiments. Remote labs can provide distance learning participants with user-friendly web interfaces and tutorials.

In addition to the proposed, you can use the methods of contextual, cross, adaptive, emotional-analytical, environmental learning, which is based on business communication.

At the same time, an important condition for the success of personal development of participants in the learning process is personal communication. It is this kind of communicative interaction that is often overlooked by teachers.

The most successful communication technologies today are: the theory of conflict-free and successful communication, the technology of transactional analysis of communicative relations of Bern (1992). Technology provides knowledge of how to make friends and influence people, how to overcome anxiety and start living, set out in the scientific papers of the same

name. The basic principle of its communication technology is that there are no bad people, but there are unpleasant circumstances that need to be wisely analyzed and overcome, while maintaining a positive motivation, which is valuable in quarantine restrictions.

E. Bern's strategy of transactional analysis of communicative relations allows to analyze one's own role advantages. This is the system based on the idea of human consciousness as a set of three states of "I": father, adult, child. Depending on the role the communicator plays, the interlocutor receives such a reaction. Role is a kind of behavioral stimulus that becomes a stimulus for the reaction of others (Kunter, 2013). The ability to analyze their role preferences allows adolescents and young people to change their views on their own communicative behavior and build communication based on constructive role trends.

Within the technology of communicative intellectualism P. Taranov determined that communicative behavior is based on the activities of the intellect. This intellectualist tendency is detailed in the author's books «Techniques of Influencing People», «Philosophy from Within», «500 Steps to Wisdom», «The Essence of Truth», which describe the principles, laws, rules, and axiomatics of behavior. Understanding them will allow pupils to understand the technology of influencing human communicative behavior.

Techniques of responsible communication will be a practical basis for the formation of communicative interaction. They are based on children taking responsibility for their own lives and reflecting this in communicative interaction. Responsible attitude, expressed in self-statements, looking ahead, stability in the pursuit of the goal should be reflected in speech communication.

This review shows only selected well-known communication platforms. The next, ***second direction of work*** with participants of distance learning is the study of organizational self-management. Communicative interaction between teacher and student will be successful only if it is well organized. Insufficient organization is one of the leading reasons for the low level of academic achievement. The issue of organizational management of distance learning, according to the results of the experimental survey is three points of contact: the technical organization of educational services, pedagogical organization, and the formation of organizational self-management skills.

The technical organization of training services includes step-by-step instructions and individual advice on the sequence of use of digital platforms. Thus, the primary organizational information in Ukraine on technical services can be obtained in the «Regulations on distance learning»

(№466 of 25.04.2013) and guidelines for the organization of distance learning at school (Kobernyk & Zvyniatskivska, 2020; Scetko, 2020).

When communicating remotely, the number of participants must be taken into account. For example, Zoom Cloud Meetings (latest version) supports up to 500 participants at a time, in the free version – 100 people for 40 minutes, Microsoft Teams – up to 300 participants, Google Meet – up to 100, Facebook Messenger – up to 50, Apple FaceTime – up to 32, Google Hangouts – up to 10, Slack – from 3 to 10; Google Hangouts – up to 10. These communication applications make business communication instant, and therefore more productive (Kobernyk & Zvyniatskivska, 2020; Scetko, 2020).

It is important to provide feedback when using any learning platform. In view of this, educators should provide a wide field for providing technical advice, during which students can individually ask questions and get answers. These can be online consultations, use of e-mail boxes, Google forms, communication via Classroom, Viber and others.

With regard to the pedagogical organization, a clear balance between the distribution of video lessons and independent work must be observed. First of all, medical recommendations for the children's health should be taken into account, according to which the work on the computer is not more than 2-3 hours a day. The strategy of online learning without breaks is not the best way out of the situation. A compromise solution should be to use video conferencing to explain new material, conduct asynchronous online testing, and shut down the computer while performing tasks on its own.

Sometimes teachers need to publish general information. To do this, it is advisable to use bulletin boards (Padlet, Linoit, Flinga), where you can place brief instructions or samples for tasks, links to video tutorials, as well as information on extracurricular activities.

In addition to general organizational activities, attention should be paid to the formation of organizational self-management skills in students. Thus, the solution of organizational problems of distance learning will be productive if it includes the implementation of three main components: technical organization, pedagogical organization, and individual organizational self-management of participants in the learning process.

Along with overcoming organizational problems, the issues of emotional support of pupils and students in the conditions of quarantine restrictions occupy an important place, which determines ***the third direction*** of pedagogical communicative influence.

The emotional sphere is an indicator of students' satisfaction with the learning process. Negative emotions are an indicator of imbalance of internal psychological structures of the body (Peterson, 2018). Conversely, positive emotions activate activities and help increase performance. Therefore, pedagogical communication should be positively oriented and focused on activating positive emotions in students. Various communication technologies are used during distance learning and in the conditions of quarantine restrictions.

Among the effective communicative influences, we can note the following:

Harmonious intellectual and emotional impact – indicates a significant increase in the intensity of mental activity during the learning process through the complementary work of the right and left hemispheres of the brain: the right, which is responsible for analytical abilities, and the left, which activates emotions and intuition. And although some researchers do not support this postulate, but in any case, it is important to involve both functions in the work, intellectual and emotional.

The next communicative approach is to accept «interesting facts». The teacher attaches an «interesting facts» sticker to some topics on the virtual bulletin board. This means that each student should prepare a summary of one interesting fact about the topic. Pupils or students exchange them during the lesson. Stickers can be different «funny stories», «rule on the contrary», etc., that is, anything that causes a positive emotional response.

During lessons, you can widely use blitz techniques of emotional exchange – short pauses for emotional communication. An example is the reception of «greeting emoticons» − at the beginning of the lesson or in extracurricular activities, children chain each other greetings in the form of emoticons. Communication ends when all participants in the process receive their smiley. Blitz techniques «emotional clock», «emotional thermometer» and many others are known, which can be used during classes or in extracurricular activities to increase the emotional background of communication. Valuable for the educational process are the methods of emotionally oriented pedagogical communication proposed by Ukrainian scholars.

Conclusion

The obtained results identified four main areas of influence on pupils and students. The first is to use communication strategies based on distance learning technologies. The second involves active interaction with pupils and students to address organizational issues (learning to use

educational online platforms, the formation of self-management skills). The third is aimed at solving emotional problems and motivation for active forms of work. The fourth is to discuss the problems of psychophysical development and health, taking into account the recommendations of the Ministry of Health of Ukraine.

So, the basic principle of emotional communication should be the motto «Everything but boredom». Let's be honest that the current education system is rarely focused on positive emotions and a positive classroom atmosphere, moreover, boredom in the classroom is a typical phenomenon, and the fear of receiving a negative assessment is inherent in most students. Therefore, the formation of emotionally oriented communication is a priority for teachers

In addition to emotional issues, experimental research has identified some problems related to health and psychophysical development associated with individual psychological attitudes to the situation of the global pandemic, the health of loved ones. The specific volume of this issue is insignificant (only 5,8%), but participants in the educational process should be aware of the situation around the spread of Covid-19. This determines the fourth direction of pedagogical influence. Pupils and students are provided with up-to-date information on the spread of coronavirus infection, health protection, the most common symptoms, etc.

Thus, the review of methods of pedagogical communication aimed at participants of the educational process, made it possible to identify four main areas of influence on pupils and students.

Digital space, the environment is today a virtual part of the social space of humanity. This space is actively developing and for its maintenance requires a whole constellation of qualitatively new professions and professional activities that are actively developing in the process of neuropedagogical processes as a manifestation of communication between a teacher and a student. In the process of development, almost all professions will one way or another become digital, so the industry of technological and technical design, the development of the digital space, will occupy a leading position along with traditional sectors, which requires special neuropedagogical processes.

The first is to use strategies of communicative interaction based on distance learning technologies. The second involves active interaction with pupils and students to address organizational issues (learning to use educational online platforms, the formation of self-management skills). The third is aimed at solving emotional problems and motivation for active forms of work. The fourth is to discuss the problems of psychophysical

development and health, taking into account the recommendations of the Ministry of Health of Ukraine.

Important principles of pedagogical communication in distance learning are the ability to activate children's desire to learn, despite quarantine restrictions, departure from the tactics of mechanical acquisition of knowledge and education of active citizenship in the implementation of educational tasks in line with the proposed educational technologies.

Aknowlegment

Author 1 analyzed the works of prominent scientists on this issue and identified the most important theoretical and methodological principles of the study.

Author 2 analyzed the conceptual provisions for the introduction of new technologies in the educational process, identified the main context of educational reform and presented his research in the article.

Author 3 on the basis of scientific publications described the essence of the basic concepts of research, presented the definition of concepts and terms from the current problem of research.

Author 4 researched and formed a list of literature on this issue

Author 5, 6 structured and compiled a list of literature of domestic researchers, structured and organized the list of literature of world researchers.

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