GENERAL SECONDARY EDUCATION

ЗАГАЛЬНА СЕРЕДНЯ ОСВІТА

PSYCHOLOGICAL AND PEDAGOGICAL PRINCIPLES OF COMPUTER ADDICTION PREVENTION AMONG TEENAGERS

S. V. Hordiichuk[*], V. O. Kovalenko[**], I. R. Makhnovska[***], L. P. Plotkina[****], I. M. Krukovska[*****]

The article is devoted to the research and analysis of the characteristics of the impact and prevalence of computer addiction among teenagers. The main causes and preconditions for computer addiction are clarified; indicators that state the occurance and presence of computer addiction among adolescents, which are distinguished in clinical, psychological and socio-psychological aspects are singled out and reviwed. Based on the experimental data, the following criteria of computer addiction are proposed: dominance, tolerance, compulsiveness, "withdrawal" syndrome, social maladaptation. The results of a sociological study on this issue are presented

[*] Doctor of Sciences (Pedagogy), Associate Professor
(Zhytomyr Medical Institute of Zhytomyr Regional Council)
stepanovasvg77@gmail.com
ORCID: 0000-0003-4609-7613
[**] Candidate of Pedagogical Sciences (PhD in Pedagogy), Associate Professor
(Zhytomyr Medical Institute of Zhytomyr Regional Council)
valalexs@ukr.net
ORCID: 0000-0001-5782-6733
[***] Candidate of Pedagogical Sciences (PhD in Pedagogy), Associate Professor
(Zhytomyr Medical Institute of Zhytomyr Regional Council)
120968irina@gmail.com
ORCID: 0000-0001-6835-9843
[****] Lecturer
(Zhytomyr Medical Institute of Zhytomyr Regional Council)
k_lp@ukr.net
ORCID: 0000-0001-5870-0219
[*****] Candidate of Pedagogical Sciences (PhD in Pedagogy), Docent
(Zhytomyr Medical Institute of Zhytomyr Regional Council)
irakrukovska@icloud.com
ORCID: 0000-0002-8215-4972

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного університету імені Івана Франка.
Педагогічні науки. Вип. 2 (105)

and interpreted. The main factors of computer addiction in adolescence are identified as follows: psychological, socio-psychological, social. Ways to overcome computer addiction and prevent its occurrence, as well as methods of rational approach to working with computers in the educational environment are outlined. It was found that computer addiction among teenagers is characterized by the replacement of real life with virtual, when there is an underestimation and ignoring of other areas of social life. The psychological and physical symptoms of Internet addiction are considered, including the major indicators that can be observed and verified by educators, psychologists, parents in order to diagnose computer addiction among teenagers, as well as to determine ways to prevent and correct it.

Key words: *computer addiction, Internet addiction, prevention system, teenagers, health, social networks, game addiction, ICTs.*

ПСИХОЛОГІЧНІ ТА ПЕДАГОГІЧНІ ЗАСАДИ ПРОФІЛАКТИКИ КОМП'ЮТЕРНОЇ ЗАЛЕЖНОСТІ СЕРЕД ПІДЛІТКІВ

С. В. Гордійчук, В. О. Коваленко, І. Р. Махновська, Л. П. Плоткіна, І. М. Круковська

Стаття присвячена дослідженню особливостей впливу та ступеня поширення комп'ютерної залежності серед підлітків. З'ясовано основні причини та передумови виникнення комп'ютерної залежності в підлітковому віці; показники, що констатують наявність комп'ютерної залежності серед підлітків, які виокремлюються в клінічному, психологічному та соціально-психологічному аспектах. На основі їх вивчення запропоновані наступні критерії комп'ютерної залежності: домінантність, толерантність, компульсивність, синдром "відміни", соціальна дезадаптація. Представлено результати соціологічного дослідження з даної проблематики. Визначено основні фактори комп'ютерної залежності у підлітковому середовищі: психологічні, соціально-психологічні, соціальні. Окреслено шляхи подолання комп'ютерної залежності та запобігання її виникненню, а також методи раціонального підходу до роботи з комп'ютером в освітньому середовищі. З'ясовано, що для комп'ютерної залежності серед підлітків характерним є заміна реального життя віртуальним, коли відбувається недооцінка та ігнорування інших сфер соціального життя. Розглянуто психологічні та фізичні симптоми Інтернет-залежності, а також визначені та обґрунтовані соціально-педагогічні умови, які сприятимуть зростанню ефективності профілактики комп'ютерної залежності серед підлітків, допоможуть педагогічним працівникам, психологам, батькам діагностувати комп'ютерну залежність серед підлітків, визначати шляхи її профілактики й корекції.

Ключові слова: *комп'ютерна залежність, Інтернет-залежність, система профілактики, підлітки, здоров'я, соціальна мережа, ігрова залежність, інформаційні технології.*

Introduction of the issue. The problem of the spread of computer addiction among young people is becoming urgent at the present stage due to the computer technologies (CT) being an integral part of their lives, as well as to the prevalence of excessive use of information and communication technologies (ICTs).

However, the period of mass use of computers and the Internet has revealed a number of shortcomings, which are characterized by negative effects on the physical and mental health of young people, especially teenagers, who are the contingent most prone to corresponding type of addiction.

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного університету імені Івана Франка.
Педагогічні науки. Вип. 2 (105)

Thus, the issue of organization and implementation of a system of preventive measures to avoid the emergence and spread of computer addiction among adolescents at the present stage has become significantly relevant.

Current state of the issue. Today, the rate of computerization is outpacing the level of development of all other industries. Computers and computer networks are an integral part of the functioning of an organization or institution [1: 167]. Computers have been rapidly introduced into the life of modern society, which for the most part does not realize what depends on them [3: 144]. It should be noted that the problem of computer addiction, especially in adolescents, is quite new to science, therefore these issues (including Internet addiction) have been studied by professional in many spheres of science and technology: *psychologists, teachers, social educators and sociologists, medical workers, etc.* [2]. The problem of prevention of addictive behavior has been studied by a large number of scientists: V. Kurbatov, V. Nikitin, O. Zmanovska, P. Pavleniuk, M. Firsova, O. Studionova, N. Dereklieieva, A. Pidaiev, O. Vozianov, V. Moskalenko, B. Naumova and other; Internet addiction in particular has been studied by A. Voiskunskyi, L. Kulikova, N. Chudova, A. Asmolova, N. Tsvietikova, A. Tsvietkova and other.

Domestic scientists L. M. Yurieva, T. Yu. Balbot dealt with the analysis of the stages of formation of computer addiction, as well as methods of its diagnosis and prevention. Prevention technologies and the causes of computer addiction are discussed in the works of B. Bykhovets, Yu. Vintiuk, T. Veretenko, H. Laktionova, T. Zhuravel, V. Liutyi, T. Liakh, N. Maksymovska, O. Chaban, T. Fedorchenko and other.

Conditions for the prevention of computer addiction in terms of socio-pedagogical conditions described by N. V. Sergeieva [4; 5: 6].

Outline of the unresolved issues brought up in the article. However, the issue under discussion has not been sufficiently studied and covered among domestic scientists. An analytical review of sources of scientific information shows that the problem of computer addiction among teenagers includes a number of undiscovered and unexplored aspects.

Results and discussion. About 85 % of modern teenagers mention computer when asked about their interests and hobbies, thus, there is a danger that lies in the excessive addition of the younger generation to the computer and its functions, namely: Internet access, games, social networks. Today, computers are in almost every home and our life can't be imagined without PCs, which are used for multiple purposes, such as education, work, leisure, etc. However, the major downside of excessive computer use lies in emergence of addiction, which gradually undermines the physical and intellectual health of a young individuals, destroys the nervous system and, as a result, makes him/her addicted to computers/and computer-related services.

This is evidenced by the results of a sociological study in educational institutions in order to identify computer addiction among adolescents and determine the factors and conditions that affect this process.

The survey was conducted in 2020-2021 among 400 respondents, among whom are secondary school pupils and students of Zhytomyr and regional HEIs. Teenagers participated in the experiment, from which two groups were formed: control group (CG) and experimental group (EG). To ensure more accurate mathematical processing of statistical information on the results of tests and creative tasks, each participant was credited points. Participants, who were at high risk of

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного університету імені Івана Франка.
Педагогічні науки. Вип. 2 (105)

developing computer addiction received 41-50 points; those of medium risk groups got 31-40 points; and, correspondingly, individuals with low possibility of addiction formation received 21-30 points. Thus, a discrete statistical distribution of the sample was constructed. First of all, teenagers said that they spend more time online than planned – 40 % of respondents.

Let's analyze the collected data, which contains statistically calculated results based on certain the answers. Thus, responds to the question *"How often do you neglect household chores to spend more time online?"* shows that the vast majority (42,3 %) "very rarely" neglect their household chores; 39,5 % of participants answered "sometimes", which indicates the initial stage of computer addiction. The following answers to the questions made it possible to determine the need of adolescents to search for feelings expression, communication or solitude, which is based on the degree of their isolation, aggression level, frustration and anxiety in behavior, especially self-esteem.

Statistically systemized answers to the questions *"How often do you prefer activity on the Internet, rather than communicating with your loved one?"* and *"How often do you make new friends with online users?"* indicate that the vast majority of respondents (55,5 %) prefer to communicate with friends/family members than using computer, but a significant proportion (31 %) still stated that they sometimes prefer spending time at PC instead. At the same time, a significant number of respondents at the same time state that they "sometimes" establish friendly relations with users online, and 16,5 % of respondents do it "often", mainly to get new impressions, positive emotions, and/or to overcome discomfort in an alternative way.

To the question *"How often do people tell you that you spend too much time online?"* the majority of respondents answer "sometimes" about excessive time on the Internet, while 16,7 % of respondents state that they "often" hear criticism of their time online. According to the registered answers to the question *"Does education or work suffer due to excessive time in the network?"* the vast majority of respondents (41 %) responded that they "sometimes" have the corresponding issues. The results suggest that a significant proportion of adolescents confirm that a long stay online has a negative effect on their learning or productivity.

Comparing the results of respondents' answers to the question *"How often do you check e-mail or social networks before doing something online?"* indicates that a significant number of respondents (14,5 %) start any activity with a computer by checking e-mail or social networks; only 14 % of respondents gave answers "very rarely".

Analysis of the following statistical results on the question *"How often do you choose a defensive position ("perceive at bayonet") if you are asked what you do online?"* proves that most teenagers suffering from computer addiction may be classified as excessive, irritable, short-tempered, emotionally unstable. However, in the process of being in social networks or computer games, the mood improves, positive emotions appear and prevail. Addicted adolescents try to build a life in the virtual world, therefore they react negatively to comments and questions about their network activities, but 28,7 % of respondents answered "sometimes", which indicates that almost a third of respondents experience negative emotional reaction to some extent when asked corresponding questions. It should also be noted that 25,3 % of respondents say that "sometimes" they drown out unpleasant thoughts about their present state and condition due to

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного иніверситети імені Івана Франка. Педагогічні науки. Вип. 2 (105)

replacing their real life with a virtual substitute. Taking into consideration the psycho-emotional component of teenagers who participated in the research, adolescents have noticed changes in their behavior and emotional state during long hours in social networks, computer games, or visiting virtual communication platforms. Subsequently, there has been a decline in the performance of such adolescents in learning, as well as degenerative memory changes, which led to inability to memorize average data quantity.

Question *"How often do you feel excited about future Internet access?"* showed that a significant number of respondents (27 %) state that they "sometimes" feel uplifted by thoughts about future Internet sessions. At the same time, a third of participants (30,3 %) believe that their lives without the access to the network instantly becomes boring and uninteresting. Also, 28 % of teenagers experience irritation from time to time if anything detaches them from cyberspace, with 7,5 % often

experiencing negative psychological reaction. It must be mentioned that 31,5 % of respondents noted that from time to time they notice signs of sleep disturbance or insomnia due to a long stay in the network; 15,7 % marked corresponding symptoms as "often"; and almost 10 % – "very often".

Comparative analysis of the answers to such questions as *"How often did you want to, but could not reduce the time spent online?"* and *"How often do you try to hide the amount of time you spend online?"* indicates that a significant number of respondents (36,5 %) "sometimes" try to reduce the time spent in the Internet, however, a third of participants acknowledged that they try to do so "very rarely". One in four respondents hides the amount of time spent online and playing computer games. Nevertheless, it should be noted that the vast majority of respondents do not prefer online communication to real meetings with friends (74 %) and do not feel depressed or in a bad mood if they are not online (69 %).

Table 1.

Statistical summary of the assessment results of the level of computer and Internet addiction among teenagers

	"Very rarely", %	"Sometimes", %	"Often", %	"Very often", %	"Always", %
"How often do you neglect household chores to spend more time online?"	42,3	39,5	14	3,7	0,5
"How often do you prefer activity on the Internet, rather than communicating with your loved one?"	55,5	31	9	3	1,5
"How often do you make new friends with online users?"	44,5	32	16,5	5,8	1,2
"How often do people tell you that you spend too much time online?"	35,3	38,8	16,7	6	3,2
"Does education or work	36,5	41	16,5	4	2

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного університету імені Івана Франка.
Педагогічні науки. Вип. 2 (105)

suffer due to excessive time in the network?"				
"How often do you check e-mail or social networks before doing something online?"	14	28	28,3	15,2	14,5
"How often do you choose a defensive position ("perceive at bayonet") if you are asked what you do online?"	61,5	28,7	7,3	1,5	1
"How often do you feel excited about future Internet access?"	65,8	27	5,2	1,5	0,5
"How often did you want to, but could not reduce the time spent online?"	29,5	36,5	19,5	10	4,5
"How often do you try to hide the amount of time you spend online?"	65,5	26	5,8	2,5	0,2

Analysis of research results on computer work and its impact on the daily life of teenagers indicated the following: 94,5 % of respondents said that they need to spend more time on the Internet to maintain the feeling of excitement and euphoria from using a computer; 59,9 % of participants say that they spend more than 3 hours at the computer without doing work or conducting study. This figure indicates a high level of addiction among adolescents. The social danger for the teenager is manifested in the replacement of direct communication with virtual – 64,3 % state that they are distracted by chats, forums and non-learning sites during work or educational process. 94,5 %.

Thus, according to the scientists, one of major symptoms of Internet addiction is the inability to control time spent on the Internet. Moreover, 46,3 % of surveyed said that their own attempts to reduce time spent in the networks were mostly unsuccessful. Students and pupils during the questionnaire stated the fact of emergence of particular changes in their physical condition, namely: rapid fatigue, back pain, dry eyes, lack of sleep, etc. Nonetheless, respondents also mentioned feeling tired while working at the keyboard; one in three teenagers neglects meals, or eats at the computer so as not to interrupt their stay on the Internet, social networks or computer games. In addition, every tenth teenager neglects personal hygiene for a longer stay in a virtual environment.

To confirm the reliability of data obtained, we determined the degree of correlation between the control and experimental groups of adolescents using a sample correlation coefficient, taking into account the paired statistical distribution of the sample. 101 teenagers took part in the pedagogical experiment, from which two groups were formed: CG with 52 members, and, respectively, EG with 49 participants.

Thus, it was found that at the beginning of the experiment (Fig. 1) the connection between CG and EG of teenagers was strong and almost functional. The sample of adolescents is homogeneous, therefore it indicates

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного університету імені Івана Франка.
Педагогічні науки. Вип. 2 (105)

that pupils and students in the control and experimental groups have almost the same level of computer addiction. At a low level the ratio is 26,9 % within CG and 28,6 % in EG; at an average level there are 55,7 % CG and 53,1 % EG respectively; at a high level the percentage is the following: 17,3 % of CG and 18,4 % EG. It should be noted that adolescents in the two groups have mostly low and medium levels of computer addiction, thus the results of the diagnosis of the level of computer addiction of teenagers within CG and EG after the formative experiment are considered. According to the experimental data, we make a paired statistical distribution of the sample.
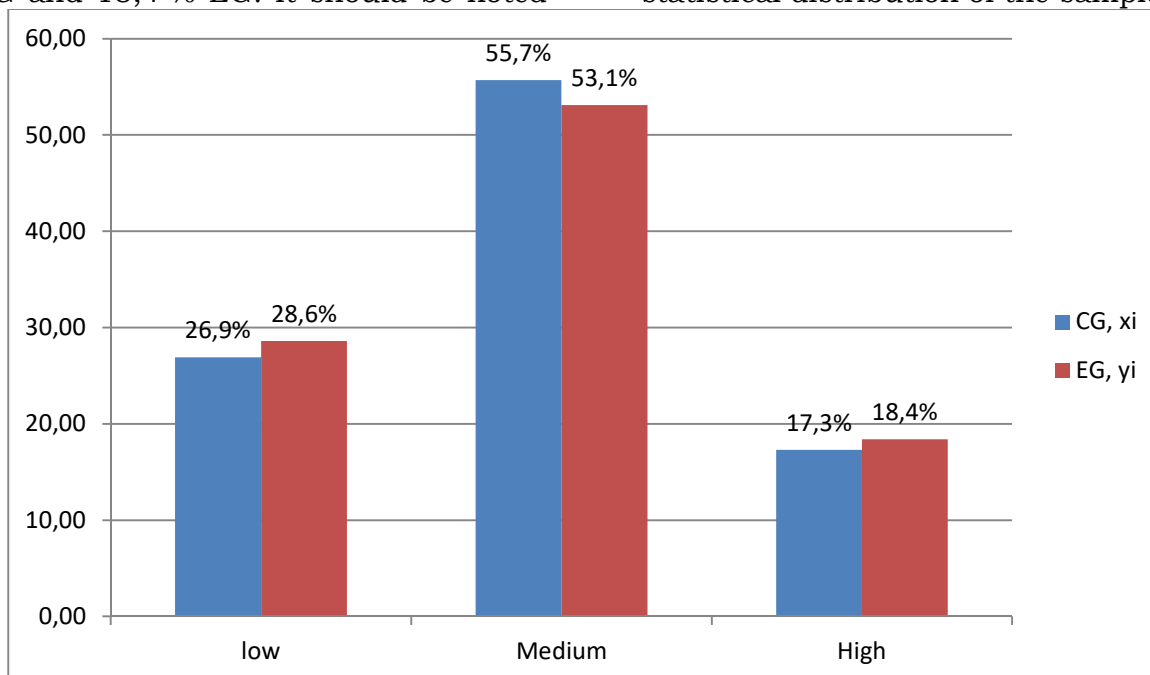

Fig. 1. Indicators of computer addiction among teenagers (CG and EG) before the experiment
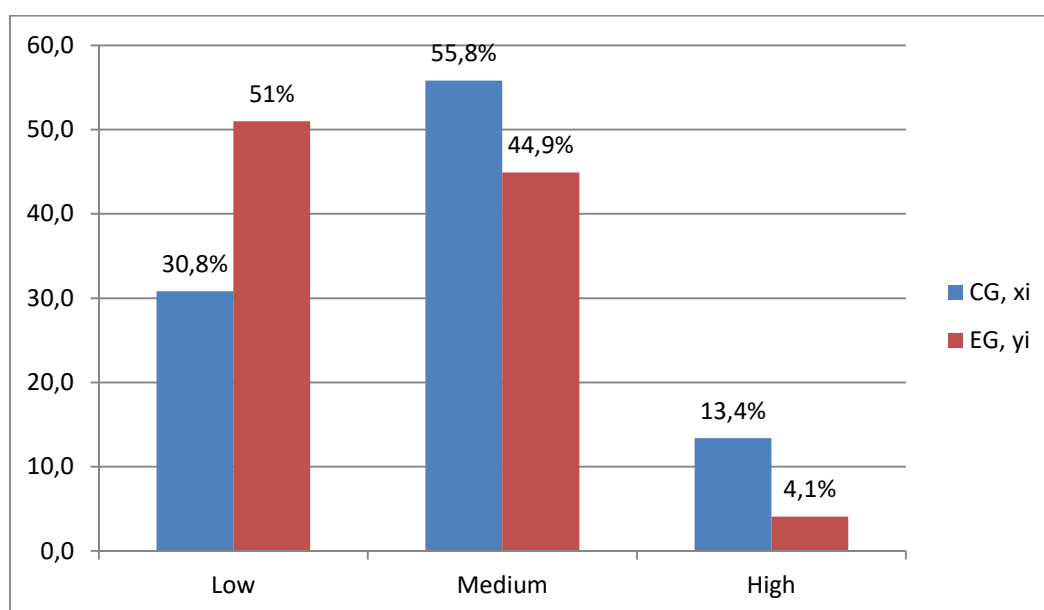

Fig. 2. Indicators of computer addiction among teenagers within CG and EG after the experiment

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного університету імені Івана Франка.
Педагогічні науки. Вип. 2 (105)

The results of these graphs (Fig. 2) indicate changes in performance compared to the beginning of the experiment.

After the implementation of the measures developed by the authors of the article (trainings, creative exercises "Symptoms", "Hourglass", "Page online", as well as educational activities, conversations, round tables, etc.) in the experimental group, the levels of computer addiction changed, and remained almost unchanged in the control group.

Thus, at a low level of CA was diagnosed in 30,8 % of adolescents within CG and 51 % within EG respectively; 55,8 % of respondents in CG and 44,9 % in EG indicated signs of CA; at a high level 13,4 % of adolescents of CG and 4,1 % of EG noted the presence of CA.

In addition, comparing the results in the control group, we see that at a low level there was a registered ratio of 26,9 % of teenagers with CA before the experiment, and 30,8 % after; on average these indicators were at 55,7 %, and 55,8 % accordingly; at a high level there were 17,3 % before and 13,4 % after the experiment. Whereas in the experimental group there were 28,6 % of teenagers before the experiment, and 51 % after; on average this indicator appeared up to 53,1 %, and after – 44,9 %; at a high level the indicators are the following: 18,4 % and 4,1 %.

The indicators of low and high levels in the experimental group changed significantly.

In order to effectively implement Internet addiction prevention program, which is aimed at secondary school pupils (teenagers) and HEI students, we've designed methodological recommendations for social workers, psychologists, and educators:

- establish cooperation with organizations working in the field of Internet addiction prevention, as well as to involve public organizations in the process;

- diversify forms and means of prevention, increase the use of verbal methods: in addition to lectures and conversations that involve passive perception of information, debates, discussions, quizzes should be used, for they can more actively involve listeners, as well as interactive methods of presenting information (trainings, role-playing games, exercises, watching feature films, cartoons, etc.);

- promote the development and implementation of programs that organize leisure of adolescents;

- involve law enforcement officers in leisure activities (sports competitions, contests), conduct story-based roleplay games in order to get acquainted with the work of law enforcement agencies;

- conduct activities on legal education in order to promote the formation of skills of safe behavior on the Internet by specialists and by the method of "peer-to-peer" by teenagers themselves;

- during their stay in educational institutions, teachers and educators should pay attention and monitor the use of PCs (for educational and cognitive purposes or not for its intended direct use);

- develop rules and guidelines for the use of personal means of communication (mobile phone, tablet, etc.) in order to monitor compliance with the regulations for the use of mobile devices during the educational process.

The socio-pedagogical and psychological mechanisms that increase the effectiveness of preventive work proved to be of a significant importance as well, namely:

- timely detection of adolescents prone to Internet addiction in an educational institution;

- establishing personal relationships: teenagers can trust adults only if they see them as friends, not enemies;

Zhytomyr Ivan Franko State University Journal. Pedagogical Sciences. Vol. 2 (105)

Вісник Житомирського державного університету імені Івана Франка.
Педагогічні науки. Вип. 2 (105)

- introduction of measures to create conditions for the formation of skills of adequate self-esteem of adolescents, a tolerant way of interaction with teachers and classmates, peers, the choice of values that would contribute to their personal development;

- providing opportunities for positive self-realization, friendly assistance;

- supporting the situation of success in learning, encouraging them to identify creative initiative, creating a common emotional background in relationships with other adolescents;

- prohibition to use aggressive forms of interaction: name-calling, humiliation, suspicion, irritability, therefore using non-destructive peer-friendly ways of interpersonal interaction, such as demonstrating samples of non-aggressive, cooperative behavior and friendly relations;

- development of a sense of humor, mutual respect, trust;

- helping teenagers feel a sense of self-competence. Any student just needs to be the best in at least some kind of activity. When developing preventive measures, teachers, psychologists must take into account that they should be aimed at all participants in the educational process – pupils, students, parents, teachers, educators.

Conclusions and research perspectives. Our research identified major indicators of computer addiction among adolescents, which are distinguished in clinical, psychological and socio-psychological aspects. Based on data obtained, the following criteria of CA are proposed: dominance, tolerance, compulsiveness, "withdrawal" syndrome, social maladaptation.

It is determined that the main factors of computer addiction are divided into: psychological (unlimited ability to create new images of "oneself" and verbalization of ideas and fantasies, psychophysiological disorders, the possible threat of mental disorders and suicidal behavior); socio-psychological (powerful expansion of the boundaries of personal communication; ease of finding like-minded and emotionally close people, meeting the need to belong to a social group and recognition; the ability to move away from reality); social (the existence of modern individual in an information-rich environment: aggressive presentation of information in the media, the emergence of new means of influencing consciousness, the weakening of key socio-cultural institutions, the lack of effective social programs of psycho-hygiene and psychoprophylaxis).

It was found that computer addiction among teenagers is characterized by the replacement of real life with virtual substitute, when there is an underestimation and ignoring of other areas of social life. Thus, it gave grounds for a general conclusion that forms and methods of preventive work should be developed, defined and justified taking into consideration socio-pedagogical conditions that will increase the effectiveness of prevention of computer addiction among adolescents.

Preventive work should be aimed at raising the awareness of the affected individuals of the impact of computers on their health, behavior, mood, as well as the positive influence of reduction of aggression and anxiety, formation of a responsible attitude to one's own health, motivation for further use of acquired knowledge and skills in learning and real life.

The solution of this problem at the level of other age groups, enrichment of the content of youth's leisure, search of ways of prevention of other types of deviant behavior remains topical for further research.

REFERENCES (TRANSLATED & TRANSLITERATED)

1. Bartkiv, O. (2014). Sotsialno-pedahohichni profilaktyka internet-adyktsii v studentskoi molodi [Socio-

pedagogical prevention of Internet addiction in student youth]. *Naukovyi visnyk Skhidnoievropeiskoho natsionalnoho universytetu im. Lesi Ukrainky. Seriia: Pedahohichni nauky. – Lesya Ukrainka Volyn National University Scientific Journal. Pedagogical Sciences.* Lutsk, № 1 (278) [in Ukrainian].

2. *Doslidzhennia kompanii We Are Social ta Hootsuite [Company research We Are Social ta Hootsuite].* Retrieved from https://hromadske.ua/posts/u-2018-internet-koristuvachiv-stalo-4-mlrd-z-nih-ponad-3-mlrd-koristuyutsya-socmerezhami-doslidzhennya [in Ukrainian].

3. Kurysko, Yu.O., & Kubitskyi, S.O. (2016). Sotsialno-pedahohichna profilaktyka kompiuternoi zalezhnosti pidlitkiv [Socio-pedagogical prevention of computer addiction of adolescents]. *Naukovyi zhurnal "Humanitarni studiyi: pedahohika, psykholohiia, filosofiia" – Scientific journal "Humanitarian Studios:*

Pedagogics, Psychology, Philosophy", vyp. 253 [in Ukrainian].

4. Lisova, O.V., & Dembitska, S.V. (2017). Profilaktyka formuvannia internet-zalezhnosti korystuvacha PK [Prevention of the formation of the InternetPC user dependencies]. *Vykorystannia innovatsiinykh tekhnolohii v protsesi pidhotovky fakhivtsiv – Use of innovative technologies in the process of training specialists:* materialy mizhnar. nauk.-prakt. internet-konf., Vinnytsia, 28-29 bereznia 2017 r. Retrieved from https://conferences.vntu.edu.ua/index.php/itpf/2017/paper/view/3290 [in Ukrainian].

5. Serhieieva, N.V. (2010). Sotsialno-pedahohichni umovy profilaktyky kompiuternoi adyktsii pidlitkiv [Socio-pedagogical conditions of computer prevention addictions of teenagers]. *Extended abstract of candidate's thesis.* Kyiv: Institute of problems of education [in Ukrainian].