Diagnosis of the deviant behaviour in the field of ICTs in adolescent schoolchildren

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Abstract. Informatization of education and all aspects of everyday and professional life of a person, led to the fact that modern man can not function fully outside the digital environment. In the information environment of the society the actual trend is the transfer of the human society norms from real life to virtual. However, along with the norms, new types of deviations from normal behaviour are transferred, adapted and appear in the virtual environment – the behaviour deviation in the field of ICT. They manifest themselves most acutely in the teenage environment due to physiology and personality development of adolescents. At the present stage of the Humanities development, insufficient attention is paid to the problem of prevention and diagnosis of students' deviant behaviour in the field of ICT. Early diagnosis of the adolescents’ deviant behavior manifestations in the field of ICT allows teachers and parents quickly responding potential problems in adolescents and provide a teenager with timely assistance, without translating the unsystematic manifestations of deviance in behavior into behavioral norm. The article presents the results of our methodology application to diagnose the deviant behaviour of schoolchildren in the field of ICT in the secondary school of Magnitogorsk based on longitudinal research of pupils.

1. Introduction

Scientific progress and the widespread introduction of information and communication technologies in all spheres of human life have led to the increasing influence of technology on the formation of moral norms, behavior and psyche of adolescents. Schoolchildren are often unable to foresee the consequences of their actions in a virtual environment, to bear responsibility for them, which reduces the degree of protection of the individual from information influences that generate deviance behavior in the ICT environment. More experienced and older users of the virtual space often demonstrate to teenagers unpunished violation of moral, ethical norms and laws. The perceived anonymity and permissiveness push at the boundaries of the norms of behaviour of the teenager in the direction of negative effects that in the future will result in consequences of varying severity, from misdemeanors to crimes.

The lack of pedagogical diagnostic tools to identify children with behavioral disorders in the ICT environment is of particular interest. The most famous test for identifying Internet dependence of Kimberly young's authorship was developed in 1994, and in 2004 V. Loskutova translated it into Russian and adapted it to the present [13]. Even less known are the methods of Russian scientists E.A. Zhichkina and E.A. Shchepilina [22]. In Russia the problem of negative impact of ICT on a person in different time engaged Alexander E. Voiskounsky, Yu.D. Babaeva, V.A. Loskutov, E.A. Zhichkina,
E.A. Shipilina, M.S. Ivanov, O.N. Arestova, N. Chusovitina, E.V. Chernova (Zerkina) [1, 2, 3, 20, 21], A.S. Dokolin [4, 7, 9]. However, standardized diagnostic tools, allowing teachers, psychologists and parents in a timely manner to track the behavior of changes in the ICT environment in adolescents are still not developed. In our work, we relied on the set of tools we developed to diagnose the deviant behavior of students in the field of ICT.

2. Deviant behavior in ICT environment

Historically, "the rules established a norm, violators showed deviations from this norm" [10]. The new human environment has also created new forms of deviating behavior, driven by new opportunities and tools offered by the virtual information environment.

Deviant behavior in the field of ICT – "a kind of deviant behavior of an individual (group of individuals), representing a system of actions (or individual actions), mediated by the use of ICT (or directed towards ICT), causing damage (moral, physical, economic and other) to society, organizations, individuals or the individual" [2].

Our study has identified 4 main types of deviant behaviour in the field of ICT (Fig.1): asocial, delinquent, addictive, and hypersensitivity in the field of ICT [2].

We give a brief description of each type of deviant behaviour in the field of ICT.

Asocial behaviour in the field of ICT is "behaviour contrary to public norms and principles, acting in the form of immoral or illegal acts committed with the use of ICT" [19]. "Asocial means almost bordering on antisocial. Asocial behaviour is manifested in a wide range-from light, minor violations of the rules of conduct to illegal actions caused by deep moral neglect" [16]. Immaturity of the teenager, both personal, and physiological very often is shown in the form of antisocial behaviour, and information and communicative technologies are the environment and the tool by means of which the teenager can to vandalize, as it believes that in the virtual world the demands of society to abide by not mandatory and there is no fear of punishment for their antics [6].

Delinquent (antisocial) behaviour in the field of ICT – "deviating behaviour, which is a misdemeanor or a criminal act committed through or in the field of ICT, which entails obtaining benefits and/or causing material, psychological, informational harm to the victim" [20].

According to K.K. Platonov, persons with delinquent behaviour due to individual psychological characteristics can not foresee the results of their offenses. "Such individuals, thoughtlessly, often under the influence of external provocation, commit an unlawful act without presenting its consequences. The force of the motive for a certain action inhibits the analysis of negative (including, for the person) its consequences" [15]. Special is the problem of bringing to suicide, when adults deliberately push the teenager to commit suicide, using manipulative techniques, for example, the game "Blue whale".

Extremism poses a great threat to the security of the individual, society and the state due to the fact that, interacting with separatism, nationalism, fundamentalism, it provides extreme forms of these phenomena [8].

In modern conditions of scientific and technological progress development, when access to the Internet is possible in almost every corner of the Earth, extremism information comes to the fore, or rather its subspecies-cybercrime [6].

Under the guise of "exchange of views" on the Internet extremists were able to conduct propaganda, recruit new supporters and increase the number of followers [5].

Cyber extremism – a commitment to extreme views, ideas and actions aimed at spreading the principles of intolerance using a combination of different means and methods of collecting, processing and transmitting information in cyberspace [4].

In today's virtual space has been an intensification of extremist and terrorist groups involved in its activities for adolescents and young adults [12].

Addictive behaviour in the field of ICT is "one of the forms of deviant behaviour with the formation of the desire to escape from reality by constant attention to certain activities mediated by ICT" [20]. V.D. Mendelevich notes that "the main motive of persons prone to addictive forms of behaviour is an active change in the mental state that does not satisfy them, which is considered as" gray"," boring"," monotonous"," apathetic" [14]. As a result, it is difficult for a teenager in reality to
find such Hobbies that could captivate him, keep attention or emotionally attract. For a teenager, life becomes saturated only in the virtual reality that he has set for himself. "Addictive behaviour is associated with the desire of a person to escape from real life changing the state of consciousness" [11]. Psychologists distinguish two options for the development of dependence: dependence on the computer or the Internet and dependence on computer games (gaming).

Particularly worth noting is this kind of deviant behaviour as hypersensitivity in the field of ICT.

According to K.K. Platonov, "a gifted person is often not adapted to the" everyday" life, is not able to correctly assess the actions and behaviour of other people, and lives in his reality. All interest of such individual is concentrated on the activity connected with his abilities, does not take active part in interaction with the world" [15]. In General, the phenomenon of hypersensitivity in the field of information and communication technologies is currently poorly understood, but adolescents with hypersensitivity in the field of ICT should also be involved in real life, and not be focused only on their successes and achievements.

3. Pedagogical diagnostics of deviant behavior in the field of ICT

Historically, "the rules established a norm, violators showed deviations from this norm" [10]. The new human environment has also created new forms of deviating behavior, driven by new opportunities and tools offered by the virtual information environment.

I.P. Podlasy "Pedagogical diagnostics is a research procedure aimed at "clarifying” the conditions and circumstances in which the pedagogical process will take place" [17]. The main purpose of pedagogical diagnostics is to identify and get an idea of what phenomena help or hinder the achievement of the required results in the educational process. The collection of information about the

![Figure 1. Classification of the types of deviant behaviour in the field of ICT](image-url)
capabilities of students, their level of training, the conditions of the process and much more, which will allow the teacher understanding the causes of deviant behavior in the field of ICT.

N.I. Semago and M.M. Semago distinguishes the following types of diagnosis [18]:

- Diagnosis, which is carried out with a group of children or even with the whole class and is aimed at highlighting children with certain properties (group characteristics), evaluating the constancy of certain psychological properties in this group of children.
- In-depth psychological diagnosis, which is carried out after the selection of children with any particular development and in need of additional developmental or remedial work, that is, in special psychological assistance.
- Dynamic examination with the help of which the dynamics of development, the effectiveness of training, developmental and/or remedial measures are traced.
- Final diagnosis, with its help assess the condition of the child "at the exit", at the end of a certain stage of his training or cycle of correctional work.

We have developed a methodology for diagnosing students deviant behaviour in the field of ICT, which includes a number of techniques, adapted for secondary school students and their parents, and carried out according to the following scheme (fig. 2) [21].

The purpose of the methodology for diagnosing students' deviant behaviour in the field of ICT is to identify the likely deviant behaviour of students in the field of ICT (or prerequisites for its occurrence). The use of the proposed method will help teachers and parents:

- Timely identification of students with behaviour al disorders in ICT.
- Timely track the prerequisites for the emergence of deviant behaviour in the field of ICT.
- Build an individual line of work with each student, which will improve the educational process as a whole.
- Start timely work with schoolchildren to prevent possible (identified) deviant behaviour in the field of ICT.

The methodology is in the nature of a longitudinal study. The data obtained as a result of the application of diagnostic techniques must necessarily accumulate. Accumulation of data is necessary to ensure that in the future it was possible to track the changes in the behaviour of the student, because the earlier observed manifestations of deviant behaviour, the easier to carry out their prevention. We recommend to apply the developed methodology at least at the beginning of each school year, the elements of the methodology can (and should) be used throughout the school year. This is necessary to replenish or update information about each student, collect information about new students. Due to the timeliness of surveys given in the methodology, it is possible to make a fairly complete picture of each student, the nature of his behaviour in the field of ICT.

The first stage is a group survey, during which students fill out:

- Questionnaire to collect basic information about the student, including questions about the interaction with communication tools (computer, smartphone, tablet), time, methods, objectives of interaction, the attitude of other family members to ICT, etc.
- Developed by E.V. Chernova (Zerkina) questionnaire for the diagnosis of deviant behaviour, based on the questionnaire "Perception of the Internet" (author E.V. Shchepilina), taking into account the factors of dependence, especially the perception of the Internet and the consequences of dependence.
- Adapted for the middle level test for Internet addiction K. Yang (translation V.A. Loskutova (Burovay)).
The second stage—an individual survey, conducted only with those students who have identified signs of likely deviant behaviour in the field of ICT. The main work should be carried out by a social educator or school psychologist, however, the teacher can also use these methods to determine the problem in a teenager and adjust the line of work with him. For specification of a type of deviant behaviour a number of special questionnaires and tests, supervision, conversation is used:

- The scale of social psychological adaptation (Spa scale) was developed by K. Rogers and R. Dimond and adapted by T.V. Snegireva.
- The method of assessment of the level of development of moral consciousness, author L. Kolberg.
- The technique of diagnostics of tendency to deviant behaviour, by A.N. Eagle.
- Study of anxiety (Spielberger questionnaire).
- Diagnostics of a condition of aggressiveness: Bass-Durk questionnaire.
- The questionnaire for the early detection of computer addicted teenager’s parents.

The third stage is the development of an individual line of work with each student, especially those who have identified the prerequisites or deviant behaviour in the field of ICT.

To analyze the results, we used the scheme of deviating behaviour analysis developed by E.V. Zmanovskaya [23].

**Figure 2. Schematic representation of the concept "diagnosis of the students' deviant behaviour in the field of ICT"**
4. The results of the work with schoolchildren 11-14 years

Historically, "the rules established a norm, violators showed deviations from this norm" [10]. The new human environment has also created new forms of deviating behavior, driven by new opportunities and tools offered by the virtual information environment.

The base for the application of the methodology for diagnosing the deviant behavior of schoolchildren in the field of ICT was the average educational school at the secondary school, 98 people. The work continued from 2015 to 2018 and was conducted in the form of a longitudinal study. The survey of schoolchildren was conducted in accordance with the methodology 2 times a year, as well as working with parents at parent-teacher meetings (questionnaires, surveys, interviews).

The aim of the study is to identify students with deviant behaviour in the field of ICT or having prerequisites for the formation of such.

The first phase, we conducted 2 times a year in September and January, and then worked together with the psychologist Chinjuchina Alina Ravilievna, and social teacher Shugurova Ella Galeevna for the correction of identified behaviour problems (second and third stage). The work was carried out under the guidance of Ph.D. Dokolin A.S.

The working group consisted of 98 students in 2015, 95 students in 2016 and 97 students in 2017. Table 1 presents the results of the study of the group of children at the beginning of each year.

Table 1. At the beginning of the year.

| Year | The focus of work with ICT | Motivation of the behaviour | "Departure" from the reality | Deviations in the behaviour | Games | Game genre |
|------|-----------------------------|----------------------------|-----------------------------|-----------------------------|-------|------------|
| 2015 | Has a clear purpose – 39 people. Easily distracted from the goal - 59 people | Life - 49 people. Entertainment - 28 people. Training, work with information - 21 people | Sometimes - 14 people Often - 10 people Rarely - 74 people | Violations of the rules and norms of behaviour in ICT environment – 20 people. Sometimes violate -25 people The behaviour is similar to the real life – 53 people | Every day – 28 people 3-5 times a week – 50 people At least 3 times a week – 20 persons | Logical – 10 people. Simulators - 15 people. Shooters- 36 people. Strategies - 25 people. Table - 12 people |
| 2016 | Has a clear purpose – 42 people. Easily distracted from the goal - 53 people | Life - 53 people. Entertainment - 18 people. Training, work with information - 24 people | Sometimes - 11 people Often - 7 people Rarely - 77 people | Violations of the rules and norms of behaviour in ICT environment – 19 people. Sometimes violate - 25 people The behaviour is similar to the real life – 51 people | Every day – 25 people 3-5 times a week – 50 people At least 3 times a week – 20 persons | Logical – 12 people. Simulators - 12 people. Shooters- 31 people. Strategies - 26 people. Table - 14 people |
| 2017 | Has a clear purpose – 50 people. Easily distracted from the goal - 47 people | Life - 55 people. Entertainment - 16 people. Training, work with information - 26 people | Sometimes - 9 people Often - 8 people Rarely - 80 people | Violations of the rules and norms of behaviour in ICT environment – 15 people. Sometimes violate - 23 people The behaviour is similar to the real life – 59 people | Every day – 20 people 3-5 times a week – 46 people At least 3 times a week – 31 persons | Logical – 13 people. Simulators - 12 people. Shooters- 28 people. Strategies - 24 people. Table - 20 people |
Thus, at the beginning of the experiment 59 (60%) respondents had problems with targeted work with ICT; 28 (29%) respondents considered entertainment as a motivating factor of their activities; 24 (24%) respondents often/sometimes "leave" reality with the help of computer games; 28 (29%) respondents have gaming dependence, and 50 (51%) are at risk.

To work with these students was attracted by the school psychologist and social worker, which revealed adolescents have different problems, behavioural and socio-cultural nature. A number of recommendations were developed for parents to reduce the manifestations of deviance behaviour in the field of ICT in adolescents.

Table 2 presents the results of the year-end diagnostics of the school population of adolescents, including the results of children demonstrating the deviation of behaviour in the ICT environment.

**Table 2. At the end of the year.**

| Year | The focus of work with ICT | Motivation of the behaviour | “Departure” from the reality | Deviations in the behaviour | Games | Game genre |
|------|---------------------------|----------------------------|----------------------------|----------------------------|-------|------------|
| 2015 | Has a clear purpose – 44 people. | Life - 54 people. Entertainment – 20 people. | Sometimes - 11 people Often - 8 people | Violations of the rules and norms of behaviour in ICT environment – 19 people. Sometimes violate - 26 people. The behaviour is similar to the real life – 53 people. | Every day – 25 people. 3-5 times a week – 52 people. At least 3 times a week – 21 people. | Logical – 12 people. Simulators - 13 people. Shooters- 32 people. Strategies - 27 people. Table - 14 people. |
| 2016 | Has a clear purpose – 49 people. | Life - 55 people. Entertainment – 15 people. Training, work with information - 25 people | Sometimes - 8 people Often - 7 people Rarely - 80 people | Violations of the rules and norms of behaviour in ICT environment – 15 people. Sometimes violate - 22 people. The behaviour is similar to the real life – 58 people. | Every day – 20 people. 3-5 times a week – 45 people. At least 3 times a week – 30 people. | Logical – 13 people. Simulators - 12 people. Shooters- 26 people. Strategies - 24 people. Table - 20 people. |
| 2017 | Has a clear purpose – 65 people. | Life - 58 people. Entertainment – 5 people. Training, work with information - 34 people | Sometimes - 10 people Often - 5 people Rarely - 82 people | Violations of the rules and norms of behaviour in ICT environment – 8 people. Sometimes violate - 25 people. The behaviour is similar to the real life – 66 people. | Every day – 15 people. 3-5 times a week – 40 people. At least 3 times a week – 42 people. | Logical – 12 people. Simulators - 13 people. Shooters- 22 people. Strategies - 20 people. Table - 25 people. |

At the end of the experiment were obtained the following results: 32 (32%) of respondents had problems with purposeful work with ICTs; 5 (5%) of the respondents believed the motivating factor of their activities – entertainment; 15 (15%) respondents often/sometimes "go away" from reality with computer games; 15 (15%) of the respondents have a gambling problem.

The results showed the effectiveness of working with such students. According to some criteria, the indicator significantly decreased: the focus of work with ICT from 60% to 32%; entertainment as a motivating factor, from 29% to 5%.
Based on the received data, it is possible to draw a conclusion about positive effect of the technique developed by us on work with such trained.

5. Summary and conclusions
It should be noted that despite the active work of the teaching staff, the number of children with deviant behaviour in the field of ICT has been constantly detected. This is due to the peculiarities of the psychophysiological period of adolescent development, as well as the weak readiness of parents to prevent the emergence of deviance behaviour in the field of ICT, or the inability to monitor the activities of the child in the network. In the course of the work, some parents were surprised by the results of the first stage of the survey, as the answers of children do not coincide with their ideas about what and how their child is engaged in the ICT environment.

In general, the study showed that early diagnosis of adolescent deviance behaviour in the ICT environment allows the correct contact of teachers, psychologists and parents to prevent their further development. Based on the results of the first stage of diagnosis, we have developed a number of extracurricular activities on identified deviations and threats to personal cybersecurity for adolescents.

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