Mikhailova, O. B. (2019). High school students involved and not involved in mmorpg: creativity and innovativeness, *International Journal of Cognitive Research in Science, Engineering and Education (IJCRSEE), 7(2),* 29-39

HIGH SCHOOL STUDENTS INVOLVED AND NOT INVOLVED IN MMORPG: CREATIVITY AND INNOVATIVENESS

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ARTICLE INFO

Original Research
Received: March, 18.2019.
Revised: May, 30.2019.
Accepted: August, 02.2019.
doi:10.5937/IJCRSEE1902029M

UDK
316.472.43-053.6:004.946(470)
159.923.2.075-053.6(470)

Keywords:
massively multiplayer online role-playing games,
innovativeness,
creativity,
virtual world.

ABSTRACT

The paper presents a theoretical and empirical analysis of involvement phenomenon in massively multiplayer online role-playing games among high school students. The characteristics of the virtual world are analyzed; its role in the life and activity of modern people is substantiated. The main features of the games that make them the most attractive to users and contribute to their active involvement in the game process are highlighted. The advantages of mass multiplayer online role-playing games are substantiated. On the basis of the theoretical analysis was formulated the aim of the study: to identify differences in the manifestations of innovativeness and creativity in high school students involved and not involved in MMORPG. Hypotheses about the existence of significant connections and differences in the manifestations of innovativeness and creativity in those involved and not involved in this type of games are formulated. The study involved 120 students of 10-11th forms and was based on the following methods: 1) questionnaire to assess the degree of enthusiasm in role-playing computer games; 2) questionnaire for the study of gaming activity, experience and gaming genre preferences of the individual; 3) self-assessment scale of personal innovative traits; 4) a multidimensional questionnaire "Innovativeness of a personality" - MQIP; 5) "Creativity" test. As a result of the study those involved in computer games are characterized by higher originality, imagination and creative thinking than their peers not playing massive multiplayer online role-playing games. The article presents a number of recommendations on the use of the plot potential of multiplayer online role-playing games for the development of high school students' personality in modern teaching practice.

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1. INTRODUCTION

Production of computer and game technologies firmly occupies a significant niche in the life of people in the XXI century and is of particular interest for the modern psychology of personality and psychology of gaming. Virtual world is becoming an integral part of reality, and its potential in influence the human psyche cannot be underestimated. It is important for modern researchers to study psychological, psychotherapeutic and developing possibilities of virtual space. The virtual world is an intangible environment that has a set of properties which allows considering the virtual world as an alternative to the physical world in psychological, social and economic sense (Belozerov, 2015).

Studies have shown that massive multiplayer online role-playing games or MMORPG (a genre of online computer role-playing games) are very popular among computer games fans (Luzakov and Omelchenko, 2012). The importance of studying both the content of the game and the psychological characteristics of MMORPG participants is due to the fact that the dynamics of changes in the level of involvement and the degree of this type of media influence intensity on a personality development can be best traced by the example

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of this type of games.

Any product of modernity is inextricably linked with the concepts of creativity and innovation, as the level of their development at each stage, from the idea generation to ending with the finished product's promotion on the market, determines the success of the idea. Computer games are no exception, on the contrary, a unique, memorable product in this area, able to attract a large audience and maintain its interest for many years, must meet the high level of requirements, be creative, permeated with novelty and be competently advanced in the market, i.e. be innovative.

Those users of the media product, who have an adequate level of involvement, can fully use the acquired knowledge for their own purposes, i.e. to be more creative by studying a huge amount of new, interesting material and ideas obtained through the gameplay and integrated into the personality as a new experience, as well as to have a higher level of innovation, because the world of computer games is inextricably linked with the world of computer technology, which requires its users to constantly adjust to the endless stream of innovative changes.

Computer games, especially massive multiplayer online role-playing ones, have a number of advantages over any other product of the media which is the active inclusion into the process, the impact of decisions on the game outcome, the ability to live and act in the virtual world. Participants are attracted primarily by the opportunity to influence the processes taking place in the game world by making a certain set of decisions chosen from a variety of options provided by the game. Thus, the player is actively influenced by the program, which is able to form certain skills, behavior and social interaction stereotypes (Luzakov and Omelchenko, 2012; Pozharov, 2014). Features of creativity and innovation among MMORPG participants of senior school age are a relevant and widespread problem, the study of which will use the potential of computer games as a resource for personal development.

Over the past decade, there have been many studies that have described both the destructive and constructive impact of online multiplayer games on their participants (Van der Aa et al., 2009; Young and De Adreu, 2010; Graham, 2013; Koles and Nagy 2014; Kuss, Griffiths and Binder, 2013; Nasyrova and Petrova 2014; Voiskunskii, 2015; Kim, 2015; Sergeeva, Tsareva and Zinov'eva, 2017; Mikhailova, 2018). The virtual world can significantly improve the quality of people's lives and destroy the adequate development of the psyche. A number of modern researchers (Frank, I., Sanbou, N. and Terashima, K., 2006; Voiskunskiy, 2015; Belozerov, S. A., 2015; Pozharov, A. I., 2004; Sublette, V. A. and Mullan, B., 2012) believe that mediated activities in virtual worlds can satisfy the basic human psychological needs. For disabled people with mobility problems, who are in a state of physical or social isolation, communication in the virtual world can be an effective means of social self-rehabilitation (Frank, I., Sanbou, N. and Terashima, K., 2006; Sublette, V. A. and Mullan, B., 2012; Dong, Wang, Yang and Zhou, 2013; Graham, 2013; Koles and Nagy 2014; Pozharov, A. I., 2004; Vilca and Vallejos, 2015; Voiskunskii, 2015; Belozerov, S. A., 2015).

The virtual space is considered by A. S. Belozerov as an environment alternative to the social and psychological problems of the real world. The researcher identifies several advantages that virtual space offers to a modern person: 1) subjective well - being; 2) friendly communities and strengthening of interpersonal relationships; 3) romantic relationships and positive emotions; 4) the state of group insight; 5) psycho- and self-therapy; 6) improvement of social conditions for disabled and physically/socially isolated people. According to the author, it is some "virtual reality analgesia" for traumas and problems of the real world (Belozerov, S. A., 2015, p. 75).

In the course of research, it was found that the satisfaction of social interaction, friendship and communication becomes as significant for the game participants as the game excitement (Frank, I., Sanbou, N. and Terashima, K., 2006; Belovol and Petrova, 2011). In addition, scientific sources claim that multiplayer online games are now played by families and friendly companies, thus maintaining common interests (Sergeeva, Tsareva and Zinovyeva, 2017). Multiplayer games form the skills to overcome difficulties, work in a team, and develop the social intelligence of participants (Yee, 2006). At present, the MMORPG plots are considered to be resources of personal identity formation (Shyrokanova, 2014), as a new kind of cultural communication (Pozharov, A. I., 2004), as the methods of active social interaction, which develop punctuality, leadership qualities, social interaction, time planning and decision-making (Shirokanova, 2014; Pozharov, A. I., 2004).

Russian authors' works demonstrate a

positive impact of computer games, including MMORPG, on the socio-psychological, personal characteristics of the involved players, as well as on the level of their self-consciousness (Kuss, Griffiths and Binder, 2013; Vilca and Vallejos, 2015; Hamade, 2018). This influence is determined by the player's need to enter a process in which there is a need to control the actions taken and to think over the consequences of such control, to analyze what is happening, to be focused, concentrated on the process of the game, to reflect, noticing changes in oneself, to participate in social interaction, through which the absence of such interaction in real life is compensated. Thus, the game is a source of rich experience for the individual, in which development is necessary to analyze one's achievements and failures, which leads to a change in personal structures, "self"- image and locus of control.

In his works, A. E. Voiskunskiy distinguishes psychotherapeutic effect from the gameplay: "convergence" of real "self" and ideal "self"; the importance of the experience of positive emotional experiences of a game situation; recreational functions of the computer game" (Voiskunskii, 2015, p. 6).

O. A. Nasyrova and O. A. Petrova emphasize the importance of computer games in learning, as they contribute to the development of perseverance, the formation of attention and persistance, and also help to organize the activities. It is also important to note that the computer game contributes to the development of hand coordination, visual perception and memory, organizational skills, develops the decision-making process. MMORPG can contribute to the development of communication skills, entry into social groups and overcoming shyness (Nasyrova and Petrova 2014).

In addition to works on the positive impact of computer games, there are a large number of studies aimed at studying their negative impact. There are such negative consequences of computer games as: changing the range of interests, its narrowing, the most active transformation of the motivational sphere in adolescence, their impact on cognitive abilities, escapism and autism, an increase in the level of aggressiveness and anxiety (Hamade, 2018; Widyanto and McMurren, 2004; Van der Aa et al., 2009; Young and De Adreu, 2010; Vilca and Vallejos, 2015).

The negative consequences of involvement in computer games include the formation of addictive behavior on the background of excessive abuse of time spent in the game. However, when describing the dependence on mass multiplayer online role-playing games, it is important to note that their users are not only dependent on computer games, but also dependent on the Internet, as MMORPG is an integral part of the global network. Thus, those dependent on multiplayer online role-playing games will have psychological characteristics of both Internet-dependent people and people with gaming addiction: the emotional sphere instability, low level of self - control, low self-esteem, subordination to others, a tendency to be guided by feelings, sensitivity, high level of anxiety and tension, introversion as the internal orientation of the person, hostility, aggression, low stress resistance and low level of spontaneity.

However, for many users, this type of game acts as a hobby, a hobby that does not carry such disastrous consequences as gaming and Internet addiction, they can be described as involved in MMORPG. In foreign and Russian scientific literature, the terms "involvement" and "dependence" are used as synonymous concepts, so we see it necessary to separate them and describe the difference between involvement and dependence.

There are fundamental differences between addiction and involvement in the world of computer games. An addict experiences a pathological attraction to a dependency object and being distracted from it, experiences a growing desire to return. The inability to satisfy this urge for some time entails negative feelings — depression, anxiety, irritability, aggressiveness. The involved person does not have such strong negative consequences of distraction from the object of interest. The person can safely switch to other activities without discomfort if it is impossible to return to the object of involvement for a long time (Dong et al., 2013; Kuss, Griffiths and Binder, 2013; Graham, 2013; Vilca and Vallejos, 2015).

The interests and motives of the behavior of a person dependent on the game are subordinated to the main motive — to return to the object of dependence as soon as possible. All other activities fall into the focus of his attention only because they can serve as a means to achieve this goal. An addict finds it very difficult to concentrate, to remember, to bring to an end what turned out to be outside the dependency object. A person, who is free from dependence, even though he is involved, does not have such a prominent gap in the scale of priorities. The person involved keeps in touch with reality, does not avoid it (Yee,

2006; Kim, 2015; Hamade, 2018).

The factors that stimulate engagement in MMORPGs include: 1) initiation, immersion, interactivity, the game genre features' impact (the scale of the game world, its details, clarity and renewal); 2) the possibility of contact not only with the game, computer characters, but also with real people; virtual relationship between them can spill over into real communication; 3) the presence of social groups, guilds, clans, communities, associations of people; 4) the possibility of development of several characters in the game, with different skills, characteristics, abilities, conduct in the game; 5) an ability to personalize, individualize one's character.

On the basis of the conducted theoretical analysis it should be assumed that there are significant differences and specificity of relationships in the manifestations of innovation and creativity in groups of high school students involved and not involved in MMORPG. By innovation we mean an integrative combination of personality traits that provide perception, evaluation, refinement, operational and practical implementation of new, also original, ideas (Mikhailova and Kaminskaja, 2016). Creativity is defined in this paper as a cognitive component of the individual's innovative potential. Creativity, expressed by intellectual activity, is an integral part of the individual's innovative potential. If creativity is considered as a set of qualities that create an idea, then innovativeness is a set of personal qualities that allow to transform a creative idea into reality (Mikhailova, 2016; 2018; Tsai, 2018).

2. MATERIALS AND METHODS

Data was collected using the following research methods: 1) a questionnaire to assess role-playing games engagement levels (Belovol and Petrova, 2011); 2) a questionnaire for the study of gaming activity, experience and gaming genre preferences of the individual (the author - N. Omelchenko (Luzakov and Omelchenko, 2012); 3) a self-assessment scale of innovative personality traits (Lebedeva, Bushina and Cherkasova, 2013); 4) a multidimensional questionnaire "Innovativeness of a personality " - MQPI (Mikhailova, 2016).; 5) "Creativity" test (N. Vishnyakova) (Kaptsov and Kolesnikova, 2011). To interpret and evaluate the data, comparative evaluation and correlation methods of statistical analysis were used: a nonparametric Mann-Whitney U-test, Spearman's rank correlation coefficient.

The following students took part in the research: 10-11 form students of the municipal budget educational institution "Khot'kovskaya secondary school № 5" (Khot'kovo, Sergiyev-Posad municipal district, Moscow oblast) – 58 students in total (27 boys and 31 girls aged 16-17 years old) and pupils of Moscow general education institution, secondary school № 48, 62 students in total (31 boys and 31 girls). The final sample consisted of two groups: the first group — involved high school students (22 girls, 38 boys) and the second group — not involved high school students (30 girls, 30 boys).

3. RESULTS

The separation of adolescents into groups was carried out through a questionnaire and survey; a questionnaire by N. V. Omelchenko for the study of the individual's gaming activity, experience and gaming genre preferences and a questionnaire to assess role-playing computer games engagement levels by E. V. Belovol and I. V. Petrova were used as methods (Belovol and Petrova, 2011; Luzakov and Omelchenko, 2012). The questionnaire included questions about whether the respondent has ever played computer games, his/her gaming preferences, time spent on the game, the features of game behavior, motivation of the subjects: with the help of the questionnaire the level of MMORPG involvement in the first group was studied. To statistically check differences in psychological characteristics of innovativeness and creativity of high school students involved and not involved in MMORPG, a nonparametric Mann-Whitney's U-test was applied.

Table 1. Results of comparative analysis of differences in all methods in the two groups (n=120)

The scale of methods		U emp.
Scale of self-assessment of innovative personality	Creativity	**640****
	Risk for success	**456****
	Orientation towards future	**881.5****
	Innovativeness index	**445.5****
The multidimensional questionnaire of individual innovativeness	Risk for the sake of new achievements	**352.5****
	Adaptability to change	**464****
	Persistence	**263.5****
	Independence	**933***
	Positive attitude	**971.5***
	Openness to something new	1229
	Intuition	1038.5
	Creative focus	1158.5
	Constructive leadership	**139****
	Common indicator	**276****
Creativity	Creative thinking	**534.5****
	Curiosity	1176
	Originality	**363.5****
	Imagination	**893.5****
	Intuition	1119
	Emotional empathy	1111.5
	Sense of humor	**264****
	Creative attitude to the profession	1117.5

Note: * - significance level $p < .05$; ** - significance level $p < .01$

Analysis of data using "Scale of self-assessment of the person's innovative traits" method by N. M. Lebedeva and A. N. Tatarko revealed differences in groups of high school students on all scales both in comparison of average values, and as a result of the non-parametric Mann-Whitney's U-criterion use. A group of high school students involved in computer games showed better results on all the scales of the methodology (Table 1, Figure 1). Statistically significant differences were obtained at 0.01 level ($p < .01$).

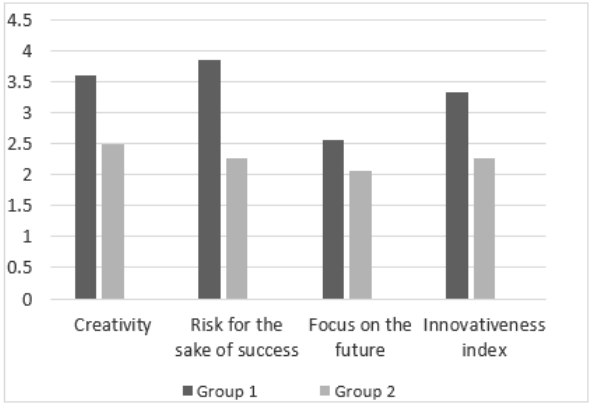

Figure 1. Results of differences (average values) on "Scale of self-assessment of the person's innovative qualities " scales methodology (N. M. Lebedeva, A. N. Tatarko) (Group 1 – involved, Group 2 – not involved).

The results of research on MQPI method showed that there are statistically significant

differences at 0.01 level ($p < .01$) on such indicators of innovativeness as *risk for the sake of new achievements, adaptability to changes, persistence, constructive leadership*, as well as statistically significant differences by 0.05 ($p < .05$) level on such characteristics as *independence and positivity* (Table 1, Figure 2).

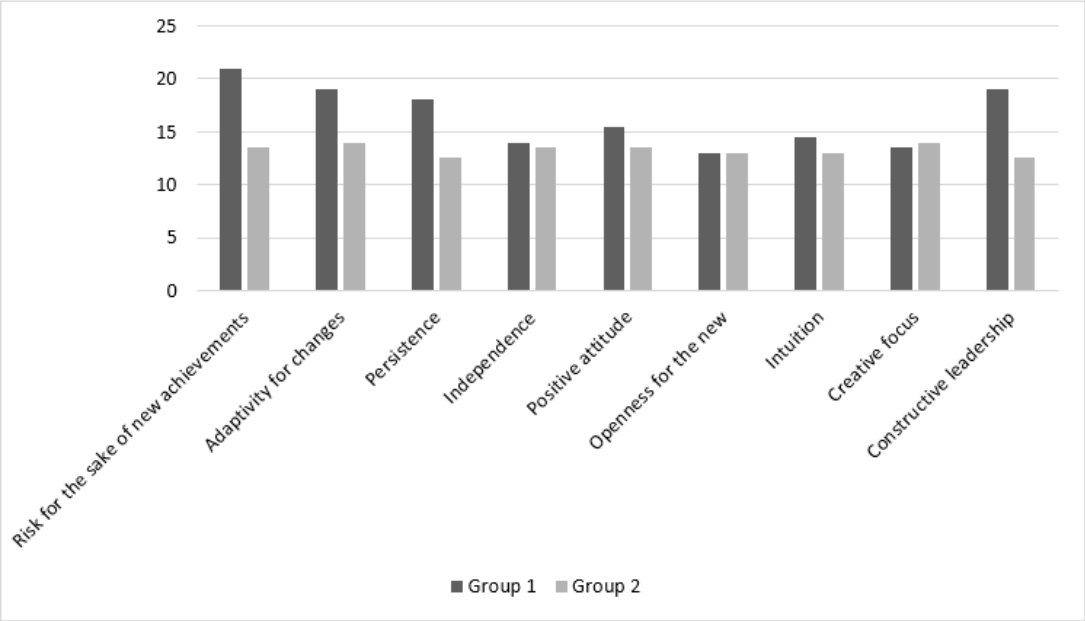

Figure 2. Results of differences (average values) on MQPI methodology scales (Group 1 —involved, Group 2 — not involved).

High school students who are passionate about MMORPG are characterized by greater adaptability to changes, ability to take risks, perseverance in comparison to their peers who are not involved in massively multiplayer online role-playing games.

The results of the study of differences by N. Vishnyakova's method "Creativity" showed that there are statistically significant differences in the involved and non-involved sample by 0.01% ($p < .01$) levels on such scales as *creative thinking, originality, imagination and sense of humor*, as the obtained empirical criterion indexes on them exceed the critical ones for a given number of subjects (Table 1 and Figure 3).

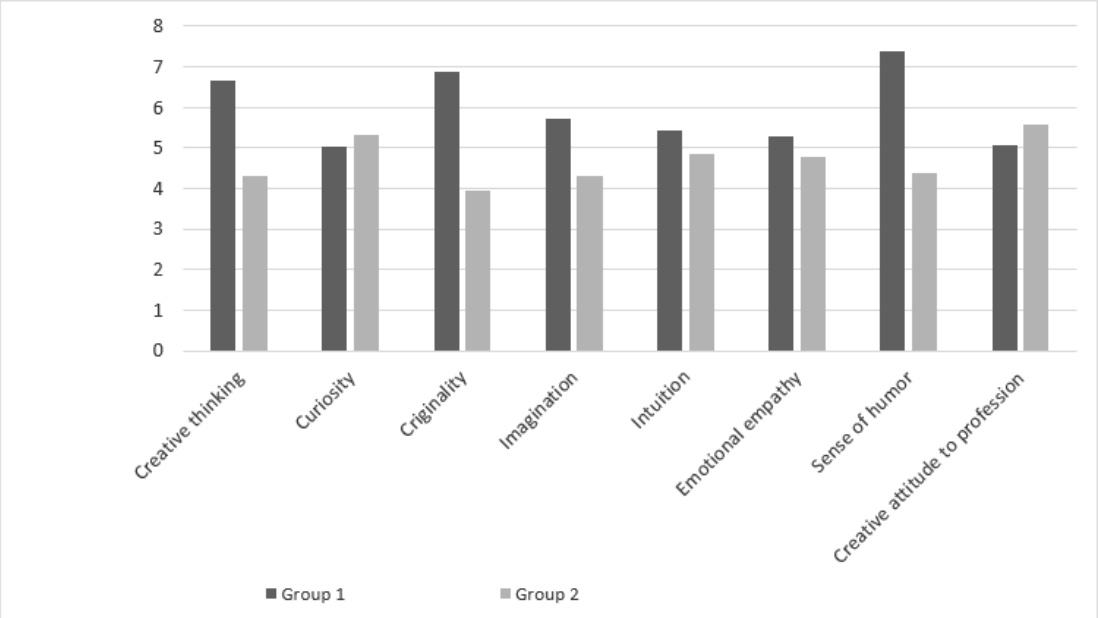

Figure 3. Comparative results of differences (average values) by the method of N. Vishnyakova "Creativity" (Group 1 – involved, Group 2 – not involved).

High school students involved in MMORPG at a statistically significant level ($p < .01$) are characterized by higher rates on the scales of *originality, imagination and creative thinking* in comparison with the second group representatives (Table 1 and Figure 3). High school students involved in MMORPG have higher rates of sense of humor than students not involved in massive multiplayer online role-playing games. However, involvement in MMORPG is not a marker that determines the high school students' manifestation of such components of creativity as *curiosity, intuition, emotional empathy and creative attitude to the profession*.

The results of the correlation analysis revealed a number of specific links in the manifestations of innovativeness and creativity in the representatives of both groups.

Table 2. The results of correlation analysis by the methods of MQPI and "Creativity" by N. Vishnyakova in groups with different levels of involvement (n=120)

Scales of the Multifactorial questionnaire of personality innovativeness	Groups 1 and 2	"Creativity" methodic scales							
		Creative thinking	Curiosity	Originality	Imagination	Intuition	Emotional empathy	Sense of humor	Creative attitude to profession
Risk for the sake of new achievements	Group 1	-.053	.111	.040	-.067	**.279***	.056	.031	.046
	Group 2	.076	-.194	.103	-.020	.065	-.033	.133	.087
Independence	Group 1	.009	.071	.215	-.191	.038	.020	.016	.140
	Group 2	.075	-.002	.133	-.121	.095	-.017	**-.265***	.055
Positive attitude	Group 1	-.007	**-.301***	-.139	.154	-.058	.009	-.052	**.276***
	Group 2	.074	-.107	.222	.129	.081	.062	-.191	.210
Openness to something new	Group 1	**.240***	.060	.061	.046	.052	-.007	.179	.046
	Group 2	-.161	.191	-.095	.152	.120	-.131	-.028	.018
Intuition	Group 1	.028	.066	.078	-.207	.018	-.122	.028	**-.249***
	Group 2	-.011	-.089	-.079	.019	.189	**.320***	.065	.081
Creative focus	Group 1	.209	-.061	-.067	.109	**.283***	.147	.041	-.146
	Group 2	-.026	.044	-.065	-.091	.025	.096	.187	.123
Constructive leadership	Group 1	.045	-.119	.111	.024	.004	**.312***	.140	.016
	Group 2	.081	-.148	.091	-.092	-.119	.052	.138	.220

Note: * - significance level $p < .05$. Group 1— involved, Group 2 — not involved.

The analysis of correlations between the scales of test methods of MQPI and "Creativity" revealed positive and negative significant relationships (Table 2).

The group of those involved is characterized by significant correlations between *risk for the sake of new achievements and intuition*. Perhaps these results are due to the specifics of the game plot, when the player needs to trust his feelings to make the right choice to achieve this goal. The second group of high school students showed a negative significant correlation between the scales of *independence and a sense of humor*. Independence of this group is perceived as a serious quality that does not cause positivity.

Let us consider the results between the "MQPI" method of innovation and the method of self-assessment of innovative personality by N. M. Lebedeva and A. N. Tatarko, presented in Table 3.

Table 3. The results of the correlation analysis by the MQPI methods and the Scale of personality innovativeness self-assessment (N. M. Lebedeva, A. N. Tatarko) in groups with different levels of involvement (n=120)

MQPI method scales	Groups	« Scale of personality innovativeness self-assessment » (N. M. Lebedeva, A. N. Tatarko)		
		Creativity	Risk for the sale of success	Focus on the future
Risk for the sake of new achievements	Group 1	-.016	**-.311***	-.054
	Group 2	.011	-.215	-.156
Persistence	Group 1	-.092	**-.423****	**-.243***
	Group 2	-.071	**-.240***	-.190
Openness to everything new	Group 1	**-.392****	-.084	-.111
	Group 2	-.171	.038	-.101

Note: * - significance level p < .05; ** – significance level p < .01. Group 1 – involved students, Group 2 – not involved.

Analysis of the results showed that the first group of respondents, in their manifestations of risk for the sake of success, does not associate success with new achievements, does not show perseverance, and is not focused on the future (Table 3). High school students involved in MMORPG show their potential abilities in the present time, in the process of gaming activities implementation. In the manifestations of creativity, they are not open to new things. It can be assumed that the specificity of gaming activity develops innovativeness, but does not focus on the implementation of potential opportunities in real life.

Let us consider the characteristics of creativity and self-assessment of the individual's innovativeness, obtained as a result of correlation analysis of data.

Table 4. The results of correlation analysis by the "Creativity" method by N. Vishnyakova and "Scale of personality innovativeness self-assessment" (N. M. Lebedeva, A. N. Tatarko) in groups with different levels of involvement (n=120)

"Creativity" method scales	Groups	"Scale of personality innovativeness self-assessment" method scales		
		Creativity	Risk for the sake of success	Focus on the future
Curiosity	Group 1	**.360****	**.289***	-.043
	Group 2	-.037	.083	.149
Intuition	Group 1	-.132	-.06	-.234
	Group 2	-.154	-.123	**-.309***

Note: * - significance level p < .05;
** – significance level p < .01

The analysis of the correlations between the scales of the two methods allowed to reveal positive and negative significant results on several scales. The first group representatives, in their manifestations of innovation and creativity, are quite inquisitive and willing to risk for the sake of success (Table 4), while the

second group representatives are not focused on the future in their intuition manifestations.

4. DISCUSSION

The study showed that adolescents involved in MMORPG have a significant negative correlation between *positivity and curiosity*, as well as a significant positive correlation between *positivity and creative attitude to the profession*. Perhaps a group of high school students involved does not show positive emotions in the interest in the world, but this group is characterized by an optimistic attitude to the future of professional creativity. In addition, for the representatives of the first group, a positive correlation on the scales of *openness to new things and creative thinking is significant*. Perhaps this is due to the need for in-game research activities that develop creative thinking through quests, but it requires the player to be open to new information, knowledge and experience. Both groups of respondents expressed a manifestation of links with the scale of intuition. However, among those respondents involved in MMORPG intuition is aimed at creative attitude to the profession and creativity, while the representatives of the second group associate it with the emotional empathy manifestation. *Intuition* of the first group representatives is more focused on creativity and professional activity manifestation.

In addition, the first group of high school students demonstrates a significant positive correlation between the scales of *constructive leadership and emotional empathy*. Empathy expression is characteristic of both groups, but in the first group, empathy is associated with the characteristics of leadership, and for the representatives of the other group, empathy is intuitive and not purposeful.

For the participants of the game activity, the manifestations of success and creativity are important here and now, and they are not ready to realize their potential in the future. It should be noted that the second group of representatives also do not show persistence in risks for the sake of success. This tendency of passivity in the sample is probably due to a general reluctance to risk for success in the future.

The study showed that adolescents with a high level of involvement in massive multiplayer online role-playing games are characterized by the presence of statistically significant links between risk for the sake of new achievements and intuition, positivity and curiosity, positivity and creative attitude to the profession, openness to new and creative thinking, intuition and creative attitude to the profession, creative orientation and intuition, constructive leadership and emotional empathy, risk for the sake of new achievements and risk for success, perseverance and risk for success, perseverance and focus on the future, openness to the new and creativity, curiosity and creativity, curiosity and risk for success.

High school students not involved in MMORPG are characterized by connections between independence and sense of humor, intuition and emotional empathy level, persistence and risk for success, intuition and focus on the future.

The results of the study revealed the following characteristics in the groups of respondents:

1. The group of high school students involved in MMORPG demonstrates higher rates of independence and positivity;
2. Involvement in MMORPG does not affect the high school students' formation of such indicators as innovativeness, openness to the new, intuition, creative orientation;
3. Representatives of the group involved in MMORPG are characterized by a more developed ability for constructive leadership and a higher level of innovation than their peers not involved in the massive multiplayer online role-playing games.
4. Those involved in computer games are characterized by higher originality, imagination and creative thinking than their peers from the second group, not playing massive multiplayer online role-playing games;
5. High school students involved in MMORPG have higher rates of sense of humor than the students not involved in massive multiplayer online role-playing games.

The gamers' subculture, like many other subcultures that arise and die according to the scenarios of new generations, is an artificial environment that forms social well-being in response to the lack of well-being in real life and activities. The saddest thing is that many new ideas born in virtual spaces and their ways of implementation remain not implemented in the real world. The most dangerous thing for humanity is that, lost in virtual worlds, homo sapiens may disappear as a species.

5. CONCLUSION

The virtual world, absorbing human resources, challenges the modern man. Currently, it is important to use MMORPG stories

and technology as resources for the development of personal potential of modern generations. The activity of the subject acts as one of the criteria and regulatory mechanisms by which the activity is carried out. Preconditions of innovative activity and real expression of the person's innovative potential are different types of activity, including the virtual one (Mikhailova, 2016). Therefore, modern teachers, psychologists and game developers need to work together to find new stories for the use of virtual space for the benefit of personal development.

The author consider the personality potential as an integrative combination of inclinations, abilities, individual characteristics and personal qualities that provide the basis (foundations) for the implementation of human capabilities in various activities (Mikhailova and Kaminskaja, 2016; Mikhailova, 2018). Therefore, while providing psychological and pedagogical support of personal potential formation and development, it is important to use the virtual world game scenarios for the formation and implementation of personal opportunities in the creative objective reality (Stošić and Stošić, 2013; Stošić, 2015).

To solve these problems, we highlight several topical areas of psychological support for the personality development using MMORPG resources: 1) the introduction of virtual technologies into the practice of modern education, using the potential of MMORPG not as entertainment, but as a means of learning; 2) psycho-prophylaxis and psychohygiene of Internet addiction formation at the earliest stages of personality development; 3) the development of more realistic and creative game plots, strengthening the semantic moral value of the plot; 4) development of the practice of virtual and real group interaction in optimal combination; 5) implementation of jointly achieved results of active virtual activity in the creative environment of objective reality.

Cyberspace, created by man, was, is and will be an additional environment for society. If humanity does not learn to manage the virtual world, the virtual world will absorb human potential and make it work against the interests of the individual and in the interests of cyberspace. In order to avoid this, it is important to develop new technologies to support the formation of personal potential, to look for new ways of development of the modern personality activity, including the use of MMORPG plots and technologies, developing creative humans, not destroying themselves and the real world of harmony between wildlife and natural human relations.

ACKNOWLEDGMENTS

The article is made in the framework of the initiative of "Internet-space as an Innovative Environment for Personal Self-realisation in Contemporary Society", performed on the basis of social and differential psychology department of Peoples' Friendship University of Russia (RUDN University).

Conflict of interests

The author declare no conflict of interest.

REFERENCES

Belovol, E. V., & Petrova I. V. (2011). Elaboration of questionnaire for the level of adolescent's computer role-playing games infatuation evaluation. *Психологический журнал, 6(32)*, 49-58. (In Russ.) https://elibrary.ru/item.asp?id=18033285

Belozerov, S.A. (2015). Virtual Worlds of MMORPG: Part II. Definition, Description, Classification (in Russian). *Psychology. Journal of Higher School of Economics, 1(12)*, 71-89. (in Russ.) https://elibrary.ru/item.asp?id=25280698

Dong, G., Wang, J., Yang, X., & Zhou, H. (2013). Risk personality traits of Internet addiction: A longitudinal study of Internet-addicted Chinese university students. *Asia-Pacific Psychiatry, 5(4),* 316-321. https://doi.org/10.1111/j.1758-5872.2012.00185.x

Frank, I., Sanbou, N., & Terashima, K. (2006, June). Some positive effects of online gaming. In *Proceedings of the 2006 ACM SIGCHI international conference on Advances in computer entertainment technology (p. 73). ACM*. http://doi.acm.org/10.1145/ 1178823.1178909

Graham, M. (2013). Geography/internet: ethereal alternate dimensions of cyberspace or grounded augmented realities?. *The Geographical Journal, 179(2)*, 177-182. https://doi.org/10.1111/geoj.12009

Hamade, S. N. (2018). Internet Addiction in Kuwait and Efforts to Control It. In *Information Technology-New Generations* (pp. 883-886). Springer, Cham. https://doi.org/10.1007/978-3-319-54978-1_110

Ivanov, M. S. (2004). Psikhologicheskie aspekty negativnogo vliyaniya igrovoy komp'yuternoy zavisimosti na lichnost'cheloveka [Psychological aspects of negative influence of computer virtual reality on identity of person]. *Psikhologiya zavisimosti: khrestomatiya*, 223-230.

Kaptsov, A. V., & Kolesnikova, E. I. (2011). The methodical aspects of use of psychometric tests in degree designing. Vestnik of Samara humanitarian Academy. *A Series Of "Psychology", 2(10),* 107-119. https://elibrary.ru/item.asp?id=16860285

Kim, N. Y. (2015). The Influence of Stress of Chil-

dren on Game Addiction-Focused on Moderating Effect of Family Support. *Journal of the Korea Society of Computer and Information, 20(2),* 209-219. http://dx.doi.org/10.9708/jksci.2015.20.2.209

Koles, B., & Nagy, P. (2014). Virtual worlds as digital workplaces: Conceptualizing the affordances of virtual worlds to expand the social and professional spheres in organizations. *Organizational Psychology Review, 4(2),* 175-195. https://doi.org/10.1177/2041386613507074

Kuss, D. J., Griffiths, M. D., & Binder, J. F. (2013). Internet addiction in students: Prevalence and risk factors. *Computers in Human Behavior, 29(3)*, 959-966. https://doi.org/10.1016/j.chb.2012.12.024

Lebedeva, N. M., Bushina, E. V., & Cherkasova, L. L. (2013). Tsennosti, sotsial'nyy kapital i otnoshenie k innovatsiyam [Values, social capital and attitude to innovations]. *Obshchestvennye nauki i sovremennost*, *4*, 28-41. https://elibrary.ru/item.asp?id=20166164

Luzakov, A. A, & Omelchenko, N. V. (2012). Semanticheskoe prostranstvo komp'yuternyh igr: opyt rekonstrukcii [Semantic space of computer games: the attemp of reconstruction]. *Politematicheskij setevoj zhurnal kubanskogo gosudarstvennogo universiteta, 78,* 1377-1411 https://elibrary.ru/item.asp?id=17714688

Mikhailova, O.B. (2016). P*sihologicheskaya diagnostika i realizaciya innovacionnosti lichnosti* [Psychological diagnosis and implementation of innovativeness of the individual], Moscow: RUDN, 152. https://elibrary.ru/item.asp?id=29456669

Mikhailova, O. B. (2018). Features of creativity and innovation development in students at secondary and high school. *International Journal of Cognitive Research in Science, Engineering and Education, 6(2)*, 11-19. https://doi.org/10.5937/ijcrsee1802011M

Mikhailova, O. B., & Kaminskaya, E. A. (2016). Gender Characteristics of the Students' Innovative Behavior. *The Social Sciences (Pakistan), 11(18)*, 4483-4488. https://doi.org/10.3923/sscience.2016.4483.4488

Nasyrova, O. A. & Petrova, O. A. (2014). Social'no-psihologicheskie aspekty komp'yuternyh igr [Socio-psychological aspects of computer games]. *Aktual'nye problemy aviatsii i kosmonavtiki, 2 (10)* (in Rus.). https://elibrary.ru/item.asp?id=22549211

Pozharov, A. I. (2014). Mnogopol'zovatel'skaya rolevaya onlajn-igra kak novyj vid kul'turnoj kommunikacii [Multiplayer Online Role-Playing Games as a New Type of Cultural Communication]. *Historical and Social-Educational Idea, 6(6-2),* 270–273. https://elibrary.ru/item.asp?id=22981447

Sergeeva, O. V., Tsareva, A. V., & Zinovyeva, N. A. (2017). «Let's Meet in Augmented Reality...»: Social Competences of MMORPG-Gamers. *Logos et Praxis, 16(4).* https://doi.org/10.15688/lp.jvolsu.2017.4.6

Shirokanova, A.A. (2014). Formirovanie lichnoj identichnosti v igrovoj povsednevnosti MMORPG [Personal Identity Formation in The Ludic Everyday of MMORPGS]. *Mediafilosofiya, 10,* 167-181. (in Rus.). https://elibrary.ru/item.asp?id=26183514

Sublette, V. A., & Mullan, B. (2012). Consequences of play: A systematic review of the effects of online gaming. *International Journal of Mental Health and Addiction, 10(1),* 3-23. https://doi.org/10.1007/s11469-010-9304-3

Stošić, L., & Stosic, I. (2013). Diffusion of innovation in modern school. *International Journal of Cognitive Research in Science, Engineering and Education:(IJCRSEE), 1(1),* 5-13. Retrieved from http://www.ijcrsee.com/index.php/ijcrsee/article/view/219

Stošić, L. (2015). The importance of educational technology in teaching. *International Journal of Cognitive Research in Science, Engineering and Education:(IJCRSEE), 3(1)*. 111-114. Retrieved from https://www.ijcrsee.com/index.php/ijcrsee/article/view/122

Tsai, K. C. (2018). An empirical examination of the relationships among creativity, the evaluation of creative products, and cognitive style among Chinese undergraduates. *International Journal of Cognitive Research in Science, Engineering and Education:(IJCRSEE), 6(1),* 53-60. https://doi.org/10.5937/IJCRSEE1702129T

Van der Aa, N., Overbeek, G., Engels, R. C., Scholte, R. H., Meerkerk, G. J., & Van den Eijnden, R. J. (2009). Daily and compulsive internet use and well-being in adolescence: a diathesis-stress model based on big five personality traits. *Journal of youth and adolescence, 38(6),* 765–776. https://doi.org/10.1007/s10964-008-9298-3

Vilca, L. W., & Vallejos, M. (2015). Construction of the risk of addiction to social networks scale (Cr. ARS). *Computers in Human Behavior, 48*, 190-198. https://doi.org/10.1016/j.chb.2015.01.049

Voiskunsky, A. E. (2015). On the psychology of computer gaming. *Psychology. Journal of Higher School of Economics, 12(1)*, 5-12 Retrieved from https://psy-journal.hse.ru/en/2015-12-1/147963491.html

Widyanto, L., & McMurran, M. (2004). The psychometric properties of the internet addiction test. *Cyberpsychology & behavior, 7(4),* 443-450. https://doi.org/10.1089/cpb.2004.7.443

Yee, N. (2006). The psychology of MMORPGs: Emotional investment, motivations, relationship formation, and problematic usage. *Avatars at work and play: Collaboration and interaction in shared virtual environments, 34,* 187-207. https://doi.org/10.1007/1-4020-3898-4

Young, K. S., & De Abreu, C. N. (Eds.). (2010). *Internet addiction: A handbook and guide to evaluation and treatment*. John Wiley & Sons. Retrieved from https://books.google.rs/books?hl=en&lr=&id=C_omSZQyfYcC&oi=fnd&pg=PT7&dq=Young,++K.+%26+de+Adreu,+C.+N.+(2011).++Internet+addiction:+A+handbook+and+guide+to+evaluation+and+treatment.+Hoboken:+Wiley.+ISBN+978-0-470-55116-5+&ots=XfeoIGxJ9Y&sig=CEB7IzZyS3FfROOv9AUhvVH60w8&redir_esc=y#v=onepage&q&f=false