

Signs of adaptability of cybersportsmen to the virtual environment

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Abstract

Objective of the study was to determine the dominant features that affect the adaptability of cybersportsmen aged 18-25 to the virtual environment.

Methods and structure of the study. As a result of the theoretical analysis, 125 features (characteristics) of e-sportsmen have been identified that affect the adaptability to the virtual environment. An online survey of 55 experts in the field of computer sports was conducted on the basis of the Yandex Forms service, where respondents evaluated each of the 125 features. To reduce the number of variables and determine the structure of relationships between variables, the data obtained were subjected to factor analysis, which made it possible to identify seven factors, including from three to 14 features.

Results and conclusions. The dominant features that affect the adaptability of a cybersportsman in the digital environment are determined: the ability to synthesize, concentration of attention, switching of attention, quickness of thinking, competition, strength of the nervous system, working capacity, emotional biorhythms, lack of need for acquiring knowledge. The results of the study can be used in the development of training programs for those involved in various disciplines of computer sports.

Keywords: computer sports, e-sportsmen, signs of adaptability, virtual environment, meta.

Introduction. One of the areas of scientific and technological development of educational activities in educational institutions is the direction associated with the development of computer sports. In connection with the ever-increasing interest in computer games among children and youth, the opening of eSports sections, increasing competition in the All-Russian and international arena, there is a need for appropriate training of professional personnel capable of solving such a large-scale problem. Coaches are limited by the number and quality of benchmarks that allow evaluating and predicting the performance of e-sports players. Some foreign sources indicate a strong correlation between the early pace of learning and the gaming efficiency of cybersportsmen in the future [2].

Based on this, it should be suggested that the level of adaptability to the new virtual environment can act as one of the criteria for evaluating the effectiveness of cybersportsmen in the future. A distinctive feature of computer sports from other sports, where the rules of competitive activity have not changed for decades, is the frequent updating of computer games used as

sports equipment and sometimes the replacement of some video games with others.

In computer sports, the concept of “meta” is used. “Meta” is the features of game mechanics, characters, skills, properties of game items, game balance, in a given period of time [1]. Often the “meta” changes during the release of major updates, at the request of the game manufacturer. The game producer has the ability to make changes to the game at any time and this will always be a problem for eSports competitors. The more global the update, the more time players need to adapt to it.

Objective of the study was to determine the dominant features that affect the adaptability of cybersportsmen aged 18-25 to the virtual environment.

Methods and structure of the study. As a result of the theoretical analysis [1], 125 features (characteristics) of cybersportsmen have been identified that affect the adaptability to the virtual environment. At the first stage of the study, an online survey of 55 experts in the field of computer sports was conducted. The contingent of respondents were: coaches,



teachers, teachers of additional education, managers, sports psychologists, video game developers. The survey was conducted on the basis of the Yandex Forms service, the respondents evaluated each of the 125 features on a scale from 1 to 10 (by the degree of influence on the player's adaptation to the new virtual environment), where 1 is a weak influence, 10 is the maximum influence.

In order to reduce the number of variables and determine the structure of relationships between variables, the data obtained were subjected to factor analysis using the factor extraction method (principal component extraction method). This method was intended to combine features into groups of factors. As a result, seven factors were identified (according to the "scree criterion"), including from three to 14 signs (43 signs).

At the next stage, to participate in the experiment, the subjects were asked to play the metroidvania "Ori and the Will of the Wisps" on a personal computer. The study group consisted of participants who had no previous experience of playing "Ori and the Will of the Wisps" or "Ori and the Blind Forest" (the first part of the game). All subjects played at a low level of difficulty, the speed of passing the game was estimated using the interface built into the game, which displays the percentage of completion of the game and the time spent on passing. The speed of passing (V) of the game was calculated by the formula:

$$V = \frac{P}{t}$$

where P is the game progress in %, t is the passage time in minutes.

After passing all the tests and filling out the questionnaire, a correlation analysis was made between

the speed of the game and the variables of each of the seven previously identified factors in order to identify the variables that affect adaptation to the new virtual environment.

Results of the study and their discussion. As a result of the correlation analysis between the speed of passing the game and the indicators of each of the seven factors, only nine indicators were identified that most affect the speed of passing the game (see table).

An average significant relationship was found between the speed of passing the game and the ability to synthesize 0.500 ($p < 0.05$). Synthetic abilities allow you to identify the leading links in a continuous flow of information, assess the situation and make the right decision. During competitive activity in the disciplines of computer sports, especially team sports, the athlete constantly has to demonstrate the ability to synthesize, on the basis of a previously formulated task - in the form of a tangible result, evaluate the components of the current situation, simulate various options for the development of the game situation, evaluate the likelihood of its occurrence and make decisions. There is a high negative significant ($p < 0.001$) relationship between the speed of passing the game by one of the indicators of concentration of attention - the number of errors, that is, the number of rings missed in the Landolt test in 10 minutes.

In the course of the correlation analysis between the variables of the second factor and the speed of the game, a significant ($p < 0.05$) negative relationship with the time of switching attention was revealed. The higher the rate of attention switching, the higher the rate of adaptation to a new virtual environment. The high switching of attention in an athlete indicates a high speed of information processing, and the accuracy of

A fragment of the correlation matrix between the speed of the game and the most significant indicators

Indicators	The speed of passing the game, % per minute
Ability to synthesize	0,500*
Concentration of attention	-0,829***
Switching attention	-0,747***
Speed of thought	0,632**
Competition	0,638**
Emotional biorhythms	0,519*
Strength of the nervous system	0,719**
Monotony	-0,795**
The need to acquire knowledge	-0,536*

Notes: from 0.900 to 1 - very high connection; from 0.7 to 0.9 - high connection; from 0.5 to 0.7 - average connection; *** - differences are significant, at the significance level $p < 0.001$; ** - differences are significant, at the significance level $p < 0.01$; * - differences are significant, at the $p < 0.05$ significance level.



switching attention has a direct relationship with the strength of nervous processes.

An average significant ($p < 0.01$) positive relationship between the speed of thinking and the speed of passing the game was revealed. In computer sports, the speed of thinking is manifested in the optimization of the speed of decision-making and the formation of an effective response to the opponent's actions.

An average, positive, significant ($p < 0.05$) relationship between the speed of passing the game and the presence of competition (rivalry) was revealed. In the course of the study, in the situation of simultaneous completion of the game by two players, the subjects showed higher results compared to the players who completed the task one at a time, despite the fact that the task of completing the task better than the second participant was not set before the subjects. The revealed relationships indicate that the presence of rivalry helps to reduce monotony, one of the determining factors of emotional stability. A negative significant ($p < 0.01$) relationship between the speed of passing the game and monotony, one of the performance indicators, was revealed.

The results obtained during the study indicate that players with a strong and medium strength of the nervous system, in accordance with the test of Ilyin E.P., show a higher speed of passing the game than players with a medium-weak and weak nervous system ($p < 0.05$).

A positive, significant ($p < 0.05$), average relationship between the speed of passing the game and emotional biorhythms was revealed. In classical sports, the control of athletes' biorhythms is one of the ways to increase the performance of those involved. A proven fact is the impact of biorhythms on the psycho-emotional state and, as a result, on human performance. As a rule, in classical sports, athletes show the highest results when the 2nd or 3rd type of biorhythm is in a positive phase. A positive,

significant ($p < 0.05$), average relationship between emotional biorhythms and emotionality of an athlete was revealed. Based on the identified relationships, practical recommendations can be developed to solve the problems of increasing the emotional state of cybersportsmen before the start of a lesson or competitive activity.

A negative significant relationship ($p < 0.01$) was found between the results in the need to acquire knowledge and the speed of the game. The best results in passing the game were demonstrated by athletes with the least need to acquire knowledge.

Conclusion. The dominant features that affect the adaptability of an e-sportsman in the digital environment have been identified: the ability to synthesize, concentration, attention switching, quickness of thinking, competition, strength of the nervous system, performance, emotional biorhythms, lack of need to acquire knowledge. A multi-stage analysis of the factors influencing the speed of the game, caused by the reasonable need to reduce the number of parameters that affect the athlete's playing efficiency, made it possible to determine the accounting parameters when compiling training programs.

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