

## ORIGINAL SCIENTIFIC PAPER

# Modern Approaches to the Preparation System of Masters in eSports

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## Abstract

The preconditions of the development of eSports are investigated and the content of Masters' preparation in eSports is substantiated. Analysis of scientific and methodological literature, Internet data and methods of mathematical statistics were used as research methods. The study involved 15 experts: eSports specialists, representatives of the Ukrainian eSports Federation. The research was conducted during of the 2019-2020. The analysis of the curriculums of the second level of post-graduate studies of 6 higher educational institutions of foreign countries was carried out. The analysis allowed identifying promising areas of eSports development in the educational environment. The main preconditions for its development with the projected benefits of eSports have been identified, potential threats have been identified, including problems with the locomotor system, decreased visual acuity, and deteriorating health due to irrational work schedule. The necessity of master's programs introduction for preparation of specialists in eSports is justified. It is established that along with the special practical skills of the player, eSports specialists must clearly understand the aspects of team building and organization of the eSports training process, as well as have theoretical knowledge, practical skills and abilities aimed at maintaining and improving their health. The terminology for ensuring the development of eSports science is clarified. The educational program of the second level of post-graduate studies of higher education specialty 017 "Physical Culture and Sports", specialization eSports was developed. According to the results of the expert evaluations method the content of the specialization cycle of the educational program was determined.

**Keywords:** *eSports, master, development, formation, prerequisites, education, maintenance, programs*

## Introduction

We are currently witnessing the informatization of show business when the merger of modern culture components the perspective phenomenon emerges such as eSports which becomes increasingly popular among youth. The origin of eSports in Ukraine tracks back to the beginning of 2000th and since then is just accelerating. Competitions by eSports athletes has become increasingly exciting and spectacular, causing the rapid commercialization of eSports and its development from a hobby into a full-fledged business in the IT entertainment

and gaming industry (Shynkaruk et al., 2019). Thus, the target audience for the eSports segment reaches 190 million people, primarily men between the ages of 18 and 24, who are able to spend more than \$20 million monthly on quality tournaments thanks to the crowd-funding system (Horova et al., 2016).

Among the countries that take the advanced positions in the world concerning distribution and assistance to development of eSports experts, call South Korea, China, the USA and countries of Western Europe (Lazneva et al., 2018). And the greatest distribution was received by next games:



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Counter-Strike (Counter-Strike: 1.6; Counter-Strike: Source; Counter-Strike: Global Offensive); Dota (DotA; Dota 2); Warcraft (Warcraft 3: The Frozen Throne); FIFA; World of Tanks; League of Legends; Heartstone; Overwatch (Buyanova, & Kozilina, 2017).

In spite of the fact that the eSports industry in Ukraine is in the formation stage today, it has considerable financial support from investors and, according to forecasts of analysts, big financial prospects (Bajkovskij et al., 2019; Shynkaruk et al., 2019).

However, rapid development of eSports is followed by emergence of new problems. International community faced an issue concerning the need of its legal settlement, the issue of development of educational programs for referee's and trainer's preparation structure of this sports discipline was in the focus as well as the issue of defining the list of the substances forbidden for eSports athletes became aggravated (Buyanova, & Kozilina, 2017).

The demands for a large part of the society for spectacular events are satisfied through eSports tournaments, which is reflected in the unprecedented growth in the number of fans, which has an audience of over 134 million viewers and can compete with hockey or American football of fans today (Shtanko, 2017).

At the same time, there is an increasing investments in eSports: the famous businessmen from the Forbes list, in particular Warren Buffett, Jeff Bezos, Jack Ma, Alisher Usmanov invest in eSports; its potential was estimated by the leading producers of gaming equipment and TV companies (Smolyar, 2017; Chaika, 2018). The eSports sector becomes increasingly attractive economically not only for investors: the leading players receive huge bonuses, and the opportunity to gain financial independence is growing too, and for gamers who do not have enough experience.

However, professional eSports carries certain risks and threats for the athlete. It is known the spread of information and communication technologies in the entertainment sphere entailed the disorder of the static-dynamic mode of a large part of the youth, leading to the decline of their physical and mental health and increasing the level of diseases of the locomotor system (Byshevets, 2018; Imas et al., 2018; Tretiak et al., 2020).

Therefore, the eSports industry has an urgent need for specialists in physical education and sports. A highly skilled eSports team coach is not only passionate about the game himself and is a skilled player motivated enough to achieve team success, but is also responsible for the health of the team members.

Currently, there is practically no information about the organization of the training process in eSports. Moreover, it is not established what theoretical knowledge and practical skills a highly qualified eSports specialist has to have.

The aim of the research was to determine the importance of educational disciplines in the eSports specialization of the second level of post-graduate studies and to form the content of the curriculum for them.

We planned to receive the research results by analyzing the curriculums of 6 higher educational institutions of foreign countries to identify teaching disciplines, and by means of an expert assessment of the importance of these teaching disciplines for eSports professionals: teachers, representatives of federations, coaches.

## Methods

Methods used include the analysis of scientific and methodical literature, Internet resources and statistics.

### Participants

Fifteen (15) experts: 9 representatives of Ukrainian eSports Federation, Ukrainian Cyber Football Association, Ukrainian Professional eSports Association, 3 eSports trainers, 3 university professors have taken part in the research, particularly in the expert survey.

### Study Organization

Studies were conducted during the preparatory period of the seasons 2019-2020 using the methods described below. The special literature and Internet data analysis and synthesis was used for the theoretical study eSports problem. The analysis of educational programs of the second level of post-graduate studies of 6 institutions of higher education of foreign countries was carried out. 6 foreign eSports sites were analyzed. The analysis allowed to identify promising areas of eSports development in the educational environment.

The aim of the expertise was to determine the importance of educational disciplines in the eSports specialization of the second level of post-graduate studies for the subsequent formation of the content of the curriculum for them. The evaluation was conducted on a 5-point scale.

Method of expert evaluations was used, when experts can evaluate different disciplines with the same number of points (Kostyukevich, & Shynkaruk, 2019). The place of each subject was determined by the number of points it received: the higher the sum of points, the more significant this subject is. The consistency of the experts' opinions was checked by Kendall's concordance coefficient.

The methodology of the group expertise included: formulating the tasks, selecting and composing the group of experts, creating the expertise plan, interviewing the experts, analyzing and processing the obtained information (Kostyukevych, & Shynkaruk, 2019).

There was a selection of specialists in curriculum development at the stage of the expert group's formation. Analysis of curriculums of higher educational institutions in foreign countries allowed us to form a list of 25 educational disciplines, which were offered to the experts to determine the significance (Table 1).

Concordance of experts' opinions was checked by means of Kendall's concordance coefficient calculation under the condition of non-strict sequence of ranking according to the formula:

$$W = \frac{2S}{m^2(n^3 - n) - m \sum_j (t_j^3 - t_j)}, \quad (1)$$

where, m – number of experts; n – sample size;  $t_j$  – number of identical ranks assigned to different alternatives by the j-th expert, S – sum of squares deviation from the mean, which was calculated according to the formula:

$$S = \sum_{i=1}^n \left( \sum_{j=1}^m x_{ij} - \bar{s} \right)^2, \quad \text{where } \bar{s} = \sum_{i=1}^n \frac{S_i}{n}, \quad s_i = \sum_{j=1}^m x_{ij} \quad (2)$$

To verify the concordance coefficient, which describes the average level of the consistency of the experts' opinions, the relevance was checked using Pearson's consistency criteria —  $\chi^2$ - criteria. The necessity of such evaluation arises because we use the sampling data (not all experts are involved, but only a group of experts, that is why the obtained result can be accidental).

**Table 1.** Expert evaluation of the content of Masters' preparation in eSports (n=15)

№	Educational discipline	Indicators; point		
		W=0.82; $\chi^2 = 295,05$ ; p=0.0000<0.01		
		$\bar{r}$	$\bar{x}$	SD
1	Information Technologies in eSports*	21.07	4.93	0.26
2	The Fundamentals of Ergonomics in eSports*	20.03	4.80	0.41
3	Sports Law, Management and Marketing in eSports*	20.07	4.80	0.41
4	The Fundamentals of Programming, Software Design and Construction of Computer Systems *	19.50	4.73	0.46
5	The Strategy and Tactics of Professional Gaming *	20.13	4.80	0.41
6	The Theory of Computer Gaming *	20.50	4.87	0.35
7	Training and Competitions System in eSports*	20.53	4.87	0.35
8	Psychological Support of Sports Activities in eSports*	19.03	4.67	0.49
9	The Scientific Research Methodology and Analytics in eSports*	20.03	4.80	0.41
10	Control and Management System of the eSports Athletes Training	14.43	4.13	0.35
11	Functional Systems and Their Adaptation in the Sports Training Process	12.97	3.93	0.46
12	Muscle Memory and Motion Area in the Technical Training of eSports Athletes	4.00	2.67	0.49
13	Preparation and Competitions in Extreme Environmental Conditions	4.83	2.87	0.35
14	Motion Skills and Physical Training of eSports Athletes	10.13	3.60	0.51
15	Modern Research Methods in eSports	10.80	3.67	0.49
16	Information Technologies in Scientific Activities in Physical Training, Sports and eSports	10.40	3.60	0.51
17	Scientific and Methodological Support for the Athletes Training	12.53	3.87	0.52
18	Current Trends in eSports Development	11.90	3.80	0.41
19	Project Activity in eSports	4.60	2.80	0.41
20	Current Problems of Enterprises in Physical Culture, Sports and eSports	4.30	2.67	0.49
21	Management of Civil Protection and Labor Protection	3.90	2.60	0.51
22	Management of Human Resources in Physical Culture, Sports and eSports	5.23	2.93	0.26
23	Current Problems of Global Communications in eSports	14.60	4.13	0.52
24	Physiology of Physical Activity	12.30	3.87	0.35
25	Professional Activity of eSports Specialists	7.17	3.20	0.41

Note: \* - academic disciplines formed the content  $\bar{r}$  - average rank;  $\bar{x}$  - average point; SD - standard deviation

Statistical analysis. The obtained data were processed by mathematical statistics using Statistica, MS Excel software. Expert assessment was carried out by the method of preference (Byshevets et al., 2019; Byshevets et al., 2019).

## Results

The rapid development of eSports is accompanied by a number of prerequisites. One of the most important factors in the eSports promotion is the development and worldwide diffusion of technology. This led to the emergence of new, more advanced computer games, and gave the impetus to the mass youth fascination with them. It is necessary to note that eSports is a platform where Ukrainian athletes have all chances to take leading positions. Thus, the government pays great attention to eSports during recent years as a means of increasing the country's prestige in the international arena.

Due to the above, it is clear that higher education institutions in sports are able to prepare highly qualified specialists, who deeply understand the theory and methods of athletes training, according to the specifics of eSports as a social phenomenon (Figure 1).

Directing resources to e-sports specialists preparation was the

higher education institutions' response to the public's appeals.

We reviewed eSports professional preparation areas in the world (Tokyo Anime School, UC Irwin, Chung-Ang University in Seoul, Robert Morris University in Chicago, and Chongqing University in Chongqing, China), which could serve the be examples of professional education (Official website: Chongqing University, 2020; Chung-Ang University, 2020; Robert Morris University, 2020; Tokyo Anime School, 2020; University of California, Irvine, 2020; Russian Cyber Sports, 2020).

The lead higher educational institutions of Ukraine that train specialists in physical education and sports began to implement the new direction (Denisova et al., 2018, 2020). The significant role of the coach is recognized, in particular, in team-tactical games. Therefore, it is possible to extend their long-term experience in training coaches in various sports to expand the accumulated theoretical knowledge and practical skills to solve the problem of preparing highly qualified coaches in eSports. In the National University of Ukraine in Physical Education and Sports by the order from 21.05.2019 № 132 (according to the decision of the Academic Council from May 21, 2019, the protocol № 10) was approved the educational and professional program "Esports" of the second level of postgrad-

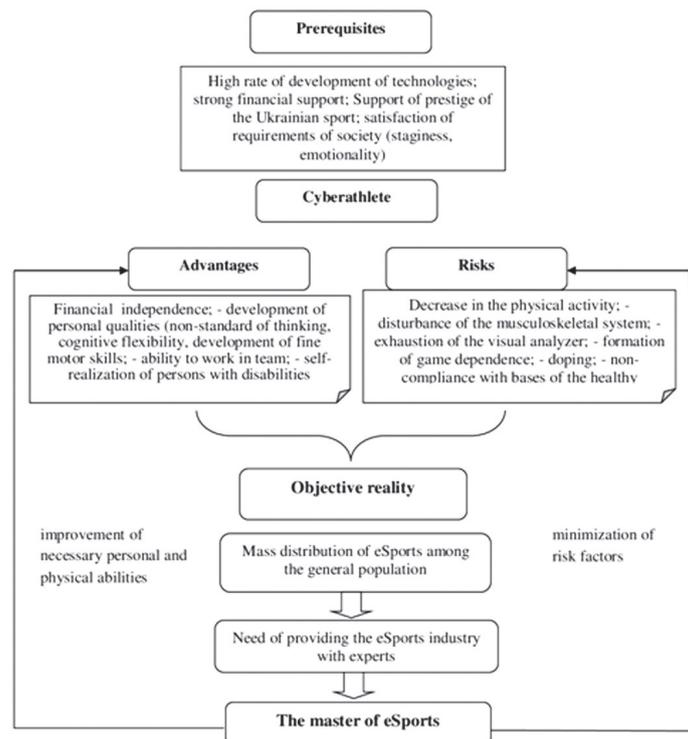


FIGURE 1. Prerequisites and consequences of the cyber industry development

uate studies for the specialty 017 "Physical Culture and Sports".

Developing the curriculum for eSports Masters, we supposed the future specialist has a positive experience as a gamer and has a passion for the game when entering the second level of postgraduate studies.

The developed curriculum includes both general (specialty cycle, specialization cycle) and elective components. The specialty cycle consists of academic disciplines, master's practice and qualification work designated by the specialty code 017 Physical Education and Sports. To determine the list of educational disciplines of the specialty cycle a survey of experts was conducted. As a result of the survey, the content of the special Master's preparation was worked out, and the competences of the specialty "eSports" were established. Development of the curriculum forming the specialization cycle was carried out by studying and analyzing the curriculums for the second level of postgraduate studies of the specialty 017 Physical Education and Sports of other Specializations, in particular, "Sports and Coaching in Olympic Sports", "Sport", "Olympic Sports and Education", etc. The expert evaluation of the importance of the proposed educational disciplines of eSports specialization is presented in Table 1.

The experts' opinion was concordant ( $W=0,82$ ;  $p=0,0001$ ). The major educational disciplines are "Information Technology in eSports", "Strategy and Tactics of Professional Games" and "Training and Competition System in eSports". The specialization cycle included academic disciplines, which were evaluated by the experts with more than 4 points. 5 points ("Information Technology in eSports", "Training and Competition System in eSports", "The Theory of Computer Gaming", "The Fundamentals of Programming, Software Design and Construction of Computer Systems", "The Strategy and Tactics of Professional Gaming", "Sports Law, Management and Marketing in eSports", "The Fundamentals of Ergonomics in eSports", "Psychological Support of Sports Activities in eSports" and "The Scientific Re-

search Methodology and Analytics in eSports"). The program includes a 32-credit course in eSports specialization cycle.

The study and analysis of international and native pedagogical experience (Korobchinsky et al., 2017; Briskin et al., 2015; Korchenaya, 2017; Denisova & Shynkaruk, 2020), and also the results of the expert survey, allowed to determine the main content of the Master's preparation in eSports.

Experts have identified educational competencies for masters in e-sports ( $W=0,79$ ;  $p=0,0001$ ), they took into account the Guidelines for the development of profiles of degree programs (Rashkevich, 2016):

- to be aware of information support related to physical education and sport;
- to know the formation history and the development stages of eSports in the world and, in Ukraine particularly;
- to have knowledge about the laws and provisions defining the modern understanding of computer games, their variations and features, and the evolution of views on their improvement;
- to know about modern methods and technologies of predicting the eSports -competitions results;
- to be able to estimate the efficiency of eSports athletes actions;
- to understand the specifics of organizing competitions, tournaments and championships at different levels in eSports;
- to have the knowledge, organization skills, planning and direct control of the training and competitive process of eSports athletes;
- to have a clear understanding of the team building and team management aspects by resolving internal conflicts timely;
- be able to create the prerequisites for the formation of the team and the management of the team; to be able to create the prerequisites for eSports athletes to develop resistance skills against external influences;
- factors in the aspiration to achieve the goal.

Except the knowledge and skills, directly related with eS-

ports, as the specialist in physical education and sport, future highly qualified specialist in eSports has to have enough knowledge and skills to prevent risks of occupational diseases and to maintain good health of eSports athletes, namely:

- to know about potential threat which occupations by eSports have;
- to be able to provide operating and current control of the physical and psychoemotional condition, and also biogeometrical position of the working pose of eSports athletes;
- to plan and carry out measures of prevention of occupational diseases of eSports athletes;
- to develop the measures directed to health maintenance and promotion of health of eSports athletes;
- to carry out the measures directed to prevention of over fatigue and psychoemotional burning out.

## Discussion

The preparation of highly qualified specialists in eSports provides the development of eSports science, and this is impossible without clarifying the conceptual framework with which the phenomenon and processes associated with the eSports industry can be unambiguously interpreted.

To ensure the eSports development in the educational environment, we identified the terms which were established, and the definition and concepts of the limits of eSports science were developed.

Analyzing the modern scientists' representation of the concept of "eSports", we found the lack of its unambiguous interpretation. In particular, in the modern edition of the Law of Ukraine "On Physical Culture and Sports" from 16.07.2019 a definition for eSports is not provided. Usually this concept is interpreted by scientists in terms of the philosophical aspect. Thus, Briskin (2015) considers eSports to forms of socialization, as close as possible to innovation, in which the most effective methods of organizing and conducting competitions are applied. In turn, Lazneva (2018) calls eSport a phenomenon that has become one of the elements of modern digital youth culture.

However, within our study we are most interested in the interpretation of eSports in the measurement of competitive activity. By comparing eSports and the computer game, Vishnevsky (2014) indicates the main difference and proves that in eSports the computer game acts not as a venue for competition, but as a link between man and computer. As Shtanko (2017) defines it, eSports is a progressive modern and innovative method of wrestling. Khasanova (2014) sees eSports as a new sphere of economic relations at the intersection of sports, the media industry, and the Internet. According to the official definition in Russia, eSport is a type of competitive activity and special practice of preparation for competitions based on computer and/or video games, where the game provides an environment of interaction between control objects, providing a level playing field for face-to-face or team-to-team competitions.

To summarize in terms of the eSports component the following definition can be given: eSports is an innovative sport aimed at the organizing and conducting sports competitions

### Acknowledgements

There are no acknowledgements.

### Conflict of Interest

The authors declare that there are no conflicts of interest.

**Received:** 15 October 2020 | **Accepted:** 29 November 2020 | **Published:** 01 September 2021

based on computer games, where eSports athletes are professional gamers, earning through participation in tournaments (Denisova et al., 2019).

Thus, the eSports science is an innovative sphere of human activity, aimed at the development of a system of knowledge associated with the support of the eSports industry, dynamically developing in the contemporary information space.

The eSports industry is an industry of material and intellectual production, providing the eSports functioning. A highly qualified eSports specialist is an expert in the theory and technique of computer sports, who carries out the activities of team organizing, their maintenance during training and competitive activities, and takes measures to maintain and improve the health of each team member.

Highly qualified specialists in eSports will fill a virtually empty niche and will become the leader of the future victories of Ukrainian eSports athletes, as we see it.

## Conclusions

There is an extreme personnel shortage in the native multi-component eSports segment in the eSports industry: managers, broadcast organizers, psychologists and commentators. Highly qualified referees, coaches, organizers of competitions, developers of computer games remain the most demanded specialists nowadays. To be able to perform professional functions at a high level, everyone has to have a clear understanding of the game and the peculiarities of team organization, as well as have a gamer's experience.

Through a long study and analysis of best pedagogical practices, as well as through our own research, it has been established that a highly qualified specialist in eSports has to have the appropriate theoretical knowledge, practical skills and abilities. In addition, in fact, the ability to organize the team and provide the training process, a highly qualified specialist in eSports has to know about the ways to increase the longevity of athletes creative and sports activities, as well as to plan and implement measures for the prevention of occupational diseases.

A conceptual framework is defined to ensure the development of eSports science. The eSports is defined as an innovative sport aimed at organizing and conducting sports competitions based on computer games, and a highly qualified eSports specialist is an expert in the theory and technique of computer sports who carries out activities to organize eSports teams, their maintenance during training and competitive activities, and takes measures to preserve and enhance the health of each team member.

The professional educational program of the higher educational level for the specialty 017 "Physical Education and Sports", specialization "eSports" was developed. Based on the methodology of expert evaluations the content of education and the list of academic disciplines for students of the second level of post-graduate studies (master's degree) were determined and the list of components of the educational program was developed. High concordance of experts' opinions ( $W=0,82$ ;  $p=0,00$ ) allowed to implement the proposed disciplines of eSports specialization in the educational process.

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