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**ANALYTICAL AND ECONOMIC SKILLS OF ATHLETES IN THE  
CONDITIONS OF DIGITALIZATION**

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**Abstract**

In the conditions of digitalization of modern society, the problem of forming analytical skills of students, which consist in the ability to receive, process, analyze and present information using information technologies, becomes urgent. In the context of the development of the information society, every person, regardless of the sphere of their professional activity, is faced with the need to search, receive, process, analyze, and evaluate information, and therefore teachers are faced with the task of developing analytical skills in students studying in various fields of training. The purpose of the research is to substantiate the need to use a virtual educational environment to increase the effectiveness of forming analytical skills of students in the conditions of digitalization of the educational environment. The research material was obtained on the basis of theoretical analysis and generalization of data presented in special literature (textbooks, manuals, dissertations, online resources, etc.). The results of diagnostics of analytical skills formation indicate the predominance of a low level of development of these skills among students. In this regard, we proposed the use of a virtual educational environment as a means of their formation. The study found that analytical skills are the most important type of individual skills in the information society. However, in the process of secondary general education, the skills of obtaining, processing and analyzing information are not sufficiently developed.

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## 1. Introduction

The complexity of the parameters and dynamics of changes in the modern world, the formation of a global information infrastructure, continentalization and globalization, information "explosion" - all these factors in the system unity make it necessary to make qualitative innovation-oriented changes in the paradigm of education implementation, in particular professional education of teachers. Significant changes affecting absolutely all spheres of life are so intense and rapid that the systems of secondary and higher professional education are no longer able to solve the problem of training a specialist in any field to such an extent that in the course of their professional activity they do not experience a crisis of competence associated with lagging behind these changes. This applies not least to employees in the field of General education, especially to teachers. Teachers no longer just have to keep up with the progress of science, technology, and information: the imperative of improving the quality of education means that they need to stay ahead of this progress in their professional development. These circumstances, first of all, determine the relevance and significance of the study of the potential of the virtual educational environment in preparing teachers for innovation. The relevance of the research is also related to the fact that the professional development of teachers should be rethought in the context of the new educational environment. Virtual educational environment: - includes information content and communication capabilities of local, corporate and global computer networks formed and used for educational purposes by all participants in the educational process; - it is created and developed for effective communication of all participants in the educational process; - it differs from the traditional method of receiving (providing) education in the nature of educational communication, carried out both indirectly-at a distance, and traditionally - "face to face". Virtual educational environment, parameters: - availability of feedback (level of interactivity); - a large number of opportunities for various types of responses; - linguistic diversity (means of expression); - personal orientation. A virtual educational environment (from a technological point of view) is an information space of interaction between participants in the educational process generated by information and communication technologies, which includes a set of computer tools and technologies that allow managing the content of the educational environment and communication of participants. Virtual learning environment (in the organizational and organizational aspect) - a complex PNP (involves changing the behavior and actions of participants in the communication process in relation to a changing situation) and training (involves the gradual establishment of effective relationships, improvement as more complex types of relationships are mastered) communication system that provides direct communication and feedback between trainers, trainees and other participants in the educational process. Virtual educational environment is a dynamically developing, multi-level and multifunctional system that combines: 1) innovative and traditional technologies that are specific to the interaction of participants in the educational process within the open model of asynchronous individual learning; 2) information resources: databases and knowledge, libraries, e-learning materials, etc.; 3) modern software tools: software shells, electronic communication tools. In accordance with the Strategy for the development of the information society in the Russian Federation for 2017-2030, approved by decree of the President of the Russian Federation dated 09.05.2017 No. 203, an information society is a society in which information and the level of its application and availability dramatically affect the economic and socio - cultural living conditions of citizens (Decree of the President of the Russian Federation dated 09.05.2017).

The "Strategy for the development of the information society in the Russian Federation for 2017-2030" defines the information space as a set of information resources created by the subjects of the information sphere, the means of interaction of such subjects, their information systems and the necessary information infrastructure (Decree of the President of the Russian Federation dated 09.05.2017). To organize the educational process in order to form educational and analytical skills, we suggest using a virtual educational environment, which we will understand as an information space through which the content of the educational environment and the interaction of participants in the educational process with each other and with individual components of the environment are managed.

It is worth noting that, despite the continuous improvement of information and communication technologies, or virtual information-educational environment in high schools, for the most part, confined to the storage of teaching materials in various forms, application systems testing, as well as distance lectures and seminars in the form of video conferencing (Asaro, 2000; Bliznevsky & Filippov, 2017). It is obvious that the use of these technologies alone is insufficient for conducting practical and laboratory classes in non-humanitarian disciplines, which will primarily contribute to the formation of information and analytical skills of students (Pritchina, 2018; Zaitsev et al., 2009). In addition, in our opinion, the virtual educational environment should be used not only as a means of distance learning technologies or organizing independent work, but also in the context of regular classroom classes, that is, it should contain software modules as components that contribute to more effective organization of various types of classes.

## 2. Problem Statement

This study examines the problems of using a virtual educational environment in order to improve the effectiveness of the formation of analytical skills of students. For this purpose, practical and laboratory work was carried out entirely in the software environment. In the course of these works, the analysis and processing of information presented in various forms was carried out. These types include: text, table, and graphic. Most of the work performed by the students involved performing measurements and calculations, the correctness of which was checked by the software module. Examples of the form are shown in Figures 1 and 2. We performed diagnostics of the formation of information and analytical skills of 56 first-year students of the University of Economics. The diagnosis was based on working with a scientific text. In the process of working with a scientific text, it was necessary to make a mental map and draw certain conclusions. The mental map is a means of structuring information, in which the main concept is located in the center of the scheme. The definitions associated with the main concept are arranged around it in the form of a "tree". Thus, mental maps can act as a means of analyzing and presenting information. The diagnostic results are shown in Table 1.

**Table 1.** Results of diagnostics of formation of information and analytical skills of students

The level of completeness	number of students, people	percentage of students, %
High	7	12,5%
Average	16	28,6%
Low	33	58,9%

Source: authors.

### **3. Research Questions**

In the context of the development of the information society, every person, regardless the sphere of their professional activity, is faced with the need to search, receive, process, analyze, process and evaluate information, and therefore teachers are faced with the task of developing information and analytical skills of students studying in various fields of training. In the course of this study, the following questions were solved:

- Conducting theoretical analysis and generalization of data presented in special literature;
- studying archival documents on the research problem;
- analyzing students' skills in obtaining, processing, analyzing and presenting the studied material using students' skills using information technologies;
- conducting diagnostics of students' analytical skills;
- developing examples of calculation forms for practical and laboratory work;
- students have developed analytical skills that they need in their professional activities in the information space.

### **4. Purpose of the Study**

The concept of "information and analytical skills" in the scientific literature is considered in various aspects and is associated with such concepts as "information skills", "information literacy", "information culture", "information competence", "analytical skills", etc. We define information and analytical skills as the possession of methods of searching, analytical and synthetic processing of information and obtaining new knowledge using information and communication technologies. Thus, the formation of information and analytical skills is possible only in the information space. The purpose of the research is to substantiate they need to use a virtual educational environment to increase the effectiveness of forming students' information and analytical skills. To achieve this goal, we have designed and implemented a number of software products (Kolenko, 2016). They were embedded in a virtual educational environment. Software products were used for practical and laboratory training. It is worth noting that such software products can also be used in various disciplines. These include natural science, mathematics, psychology and education, and a number of other profiles. We have developed, created and tested software modules in the following disciplines: "Mathematics", "Age-related anatomy and physiology", "Psychology", "Technical mechanics", etc. (Korchemkina, 2016; Korchemkina et al., 2018).

### **5. Research Methods**

The main method of this research was chosen as the method of theoretical analysis and generalization of data from special literature. In total, more than 50 literary sources of domestic and foreign authors were studied. The main ones are given in the list of references. In addition, archival documents were studied, namely: orders and resolutions of the government of the Russian Federation related to the research problem. Identification of the formation of analytical skills and abilities of students was carried out on the basis of a survey of students. The results of the study were processed using mathematical statistics. When developing a calculation and reference form for practical and laboratory work, it was

performed using the modeling method. Despite improvements in the educational environment and information and communication technologies in universities, all are reduced to the storage of teaching materials in various forms, distance lectures and seminars, the use of test systems, and video conferencing.

## 6. Findings

In the course of the study, the level of formation of students' analytical skills was determined. A high level of formation of these analytical skills was noted in 12.5% of respondents. The majority of students (58.9%) rate the level of formation of these skills as low. 28.6% of respondents rate this indicator as average. The general characteristics of these software products are as follows:

1. The practical or lab work is completely carried out in software environment.

2. In the course of work, the analysis and processing of information presented in various forms: text, table, graphic. Most of the work involves performing measurements and calculations, the correctness of which is checked by the software module. Examples of the form are shown in Figures 02 and 03.

3. The result of the work is a report made according to a certain template. In this case, the results of calculations or passed tests are automatically placed in the report template, and the student's task is to formulate conclusions based on these results. The finished text report is exported to MS Word format.

Task 2. Building a physical development profile. Assessment of the harmony of physical development using standards method. Based on the obtained individual (X) indicators of physical development, calculate individual deviations from the norm in Sigma.

Thus, in the process of performing the work, the student receives, processes, analyzes and presents information, that is, the formation of information and analytical skills takes place.

The individual value of the indicator (X)	Age norm (M±o)	Individual deviation of the indicator from the norm (X-M)	Individual deviation of the indicator from the norm (X-M) in Sigma (X-	
			Women	
Body length, 166	cm162±5,12			
Body weight, 57	kg59,6±6,82			
Chest circumference, 86	33,8±5,03			
Power of the leading hand, kg 35	kg80,41±10,06			
Back strength, 75				
Lung capacity, 13,4±0,54				

**Figure 1.** An example of calculated form for laboratory work

Source: authors.

<b>Standards method</b>
<p>Assessment of physical development of children and adolescents is made by comparing anthropometric and physiometric characteristics of the subject with the average indicators of the age and sex group of this population, using the method of standards.</p> <p>The essence of the latter is to compare individual anthropometric values with standard ones obtained as a result of mass surveys of representatives of a specific age and gender group.</p> <p>To do this, you must:</p> <ol style="list-style-type: none"><li>1) determine the age of the subject in years;</li><li>2) find the difference between the individual values of the studied indicators and their tabular (standard) values; 3) find the quotient of the difference obtained above by the average square deviation of each indicator. The obtained data of a specific population are processed by the variational-statistical method, as a result, the average value of each indicator (M) and the mean square deviation - Sigma (<math>\sigma</math>), reflecting the value of fluctuations from the average value, are obtained. By the size of the Sigma deviation, one can judge the level and harmony of physical development. <i>There are the following levels of physical development:</i></li></ol> <ul style="list-style-type: none"><li>- high if the indicator is in the range of <math>+2.0\sigma</math> or more;</li><li>- above average if the indicator is in the range from <math>+1.0\sigma</math> to <math>+2.0\sigma</math>;</li><li>- average-individual indicator is in the range <math>=1.0\sigma</math> (i.e. MK); - no average if the indicator is in the range from <math>-1.0\sigma</math> to <math>-2.0\sigma</math>; - low if the indicator is in the range of <math>-2.0\sigma</math> or less.</li></ul>

**Figure 2.** An example of reference form for laboratory work

Source: authors.

## 7. Conclusion

The formation of information and analytical skills of students consists in the ability to receive, process, analyze and present information using information technologies. The use of a virtual educational environment increases the effectiveness of the formation of information and analytical skills of students in the conditions of digitalization of the educational environment. The conducted research allows us to conclude: 1) information and analytical skills are the most important type of student skills in the information society. 2) diagnostics of the formation of these skills in first-year students of economic higher education indicates that in the process of secondary general education, the skills of obtaining, processing and analyzing information are formed to an insufficient extent. 3) the contradiction between the low level of formation of analytical skills in students and the urgent need to form these skills in future specialists indicates the need to find effective means of forming these analytical skills. Such a tool can be a virtual educational environment that allows, among other things, to conduct practical and laboratory classes using special software modules. This research will help students develop the skills they need in their future professional activities.

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