Original Article

Theoretical aspects of design and development of information and educational environment in the system of training of masters in physical culture and sport

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Abstract:
Theoretical aspects of design and development of information and educational environment in the system of
training of masters in physical culture and sport. *The purpose of the article* is specification of the notions and
analysis of theoretical aspects of elaboration and functioning of informational and educational environment
(IEE) in the system of training of future masters in physical education and sports (PE and Sports) under
conditions of a developed informational society on the example of IEE of National University of Physical
Education and Sport of Ukraine (NUPESU). *Results.* Essence and specific features of IEE in the system of
training of future masters in PE and Sports have been revealed and described. IEE of a higher educational
establishment oriented on physical culture defines informational flow of educational orientation, in which there
is circulation of specific information of a pedagogical character, producers and consumers of which are subjects
of the system of training of future masters in PE and Sports united with the help of network, remote, and cloud
technologies with purpose of masters' complete realization of their potential and selection of individual
educational trajectory. It has been revealed that IEE of a higher educational establishment has informational,
educational, and research levels. Content, organizational, and technological components have been distinguished
in the structure of IEE. Content and technological component of IEE of a higher educational establishment has
been shown in the system of training of future masters in PE and Sports based on IEE of NUPESU.
Key words: environment, informational and educational, structure, component, constituent, notion, content,
technologies, interaction.

Introduction.
        The state has set its course, approved by the Cabinet of Ministers of Ukraine in the Decree "On Approval
of the Concept of Development of Digital Economy and Society of Ukraine for 2018-2020" January 17, 2018 №
67, on the development of scientific digital infrastructure of scientific and educational establishments, provision
of open access to scientific data and knowledge for all layers of society.
        Under conditions of a developed informational society, a priority area of training of future specialists to
live in digital society is formation and implementation of informational and educational environament of a
higher educational establishment (Lyubarets V.V., 2019).
        The introduction of information technologies "into education as a set of methods, tools and techniques
used to collect, systematize, store, process, transmit, present all kinds of messages and data, resulted in the
formation of the term information-educational environment" (IEE) (Moiseienko N., Moiseienko M., 2016).
        IEE is viewed as a platform for realization of a combined education in a higher educational
establishment (Kobysya, 2019) while its creation is considered to be a basis for providing participants of
educational process with content and other informational and educational resources with the aim to efficiently
manage educational and cognitive activity of its participants (Topuzov, 2017).
        Informatization of higher educational establishments gives more opportunities for realization of
educational aims in the system of training of future masters in PE and Sports (Byshevets, 2017). Nowadays, the
system of training of masters in physical culture has tendencies for individualization and personalization of
educational process via provision with actual information, engagement in research activity, implementation of
innovation educational technologies, in which there is an option of remote access to educational resources as a

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supplement to traditional educational (Denysova, 2017, Shynkaruk, 2019). Effective conditions for communication and cooperation between a teacher and student are being created. That is, subjects of educational activity interact within IEE of a higher educational establishment (Myhovych, S.M., Tverezovska. N.T., 2012).

However, up until present day, science methodology has not had a fixed number of notions, namely the notion of "informational and educational environment in the system of training of future masters in PE and Sports"; theoretical aspects of projecting the aforementioned environment in a higher educational establishment oriented on physical culture. Moreover, a need to define its structure, principles, on which it is based, totality of methods and mans of functioning under conditions of a developed informational society arises.

The aim of the research is to specify the notions and analyze theoretical aspects of elaboration and functioning of IEE in the system of training of future masters in physical education and sports, namely masters in PE and Sports, under conditions of a developed informational society on the example IEE of National University of Physical Education and Sport of Ukraine.

Material and methods.

Used methods include analysis of scientific and methodical references, Internet data, and systematization and generalization of leading pedagogical experience.

Results.

IEE in a higher educational; establishment focuses on information. Thus, its peculiar features are connection with physical culture and sports activity, and orientation on revealing aspects of development of physical culture and sport.

With the aim to spcify the conceptual apparatus regarding design and operation of the information and educational environment of higher educational establishment, the essence and specificity of the basic terms used in the course of the study of educational systems under conditions of progressive development of techniques and technology have been studied; theoretical aspects of the e-learning culture for training of future masters in PE and Sports have been studied and systematized.

It is well known that the information and educational environment of higher educational establishment integrates all sub-structures and units of its activity, including personnel accounting, planning of the educational process, monitoring of educational achievements etc. Keeping in mind the administrative and management orientation of a higher educational establishment informatization, which involves solving the problem of increasing the efficiency of teaching staff and administration, let us dwell in the problem of improving the quality of education, which focuses on student's personality. From this point of view, information and educational environment of a higher educational establishment oriented on physical culture is an information stream of educational orientation, in which there is circulation of specific information of sports and pedagogical character, producers and consumers of which are the subjects of the system of training of future masters in PE and Sports, united by network, remote, and cloud technologies in order to completely realize their potential and select individual educational trajectory.

Higher educational establishments provide for the inseparability of studies and research, for a possibility to acquire knowledge, academic education and professional skills, academic degrees and professional qualifications. They work in the field and on the development of sciences

The main goal of creating an information and educational environment of a higher educational establishment oriented on physical culture is to improve the quality of education of future masters in PE and Sports via modernization of their training system in accordance with the requirements of the times and taking into account existing trends in education and achievements of scientific and technological progress.

A priority task is to meet information and educational needs of the academic and student staff in the system of training of future masters in PE and Sports. Therefore, local tasks should be considered via combination of information resources of a higher educational establishment by establishing a local network with a distinguished server, forming a library and implementing local network educational programs, creating a single information base, as well as providing users with regulated access to information (Kizim, 2017).

Information and educational environment of a higher educational establishment in the system of training of future masters in PE and Sports has the following levels:

- information;
- educational;
- research.

It should be noted that the given division is rather conditional while these levels intertwine to certain extent, interpenetrate, and interchange.

Information and educational environment of a higher educational establishment oriented on physical culture, as well as of any higher educational establishment, includes content, organizational and technological components. It has been determined that the content component includes informational, educational and scientific-methodical part and is provided with information resources, electronic educational and methodical materials. The organizational component, consisting of the information support system, the information

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marketing system, and units that ensure functioning of the information and educational environment of a higher educational establishment, is tasked with ensuring management of the environment and its content. The technological component is divided into apparatus subsystem, service system and communication, and contains software and technical means of interaction of participants of the educational process. Thus, it can be assured that the peculiarity of information and educational environment of a higher educational establishment oriented on physical culture primarily determines its content, which is directly related to professional training of future masters. The basis of designing information and educational environment of a higher educational establishment oriented on physical education includes generally-accepted in different countries of the world and thoroughly described principles, namely "Social – Mobile – Access – Regulated – Technology" , i.e. social orientation, mobility, accessibility, regulation, and technology (Topuzov, 2017, Sokurenko, 2018).

From the point of view of subjects of educational activity, it is information and educational part of content, as well as technological means that provide access to information and educational resources that attract the biggest interest. Constituents of content and technological component of an information and educational environment of a higher educational establishment at the "teacher-student" level are shown on the figure.

Let us analyze the levels of functioning of IEE in the system of training of future masters on the example of information and educational environment of NUPESU, which is provided with a broad arsenal of information and communication means and resources via Internet.

Analyzing information level of the environment, it should be noted that its leading subsystem is the university's web site - a large information resource, which is primarily focused on the one hand, on representation of NUPESU on the Internet, as a leading higher educational establishment with its high level of education and science in the field of physical culture and sports, on the other on granting educational subjects and other interested persons access to actual information of the organizational plan, basic and auxiliary educational, scientific and teaching materials. Content units, user-friendliness, dynamics, design and technical indicators that characterize the higher education establishment's web site (Pereguda, 2018) are addressed by the relevant units. It should be noted that some of its components, including the library and repository, carry out an educational function, and academic staff are involved in the continuous supplementing of the repository with published results of their own scientific activity. Thus, the web site meets information needs of participants in the educational process, teachers and students using this information most often. It should be added that access to the content can be obtained from any technical device connected to the Internet (Fig. 1).

Application of network, remote, cloud and smart technologies, social networks of the Internet, mobile access in education that open up wide opportunities for receiving any information according to the user's request through special real-time communication programs, ICT networks and social networks, automated search engines, e-mail, educational e-publications and educational sites (Pichugina, 2015), has been shown at the research level of information and educational environment of NUPESU. We have defined the following main development areas of the research component of information and educational environment of NUPESU: holding scientific web conferences and webinars, creating a system of electronic publications, presented by periodicals of NUPESU, development of Internet servers of scientific schools of NUPESU.

Modern technologies, such as webinars and web conferences provide an opportunity for academic staff to participate in discussions, conferences, symposia, etc .; invitations are sent via e-mail to publish the results of scientific researches, collections of research papers and materials of the results of conference work. Moreover, teachers and students actively interact through social network tools, which simplifies the process of information exchange between participants in the educational process. Services such as Facebook social network, which is considered as a tool for students' collaboration with the research supervisor of the group, consultants and research participants, united "Student Scientific Group of the Department of Innovation and Information Technologies" group. At the same time, information about the planned student scientific conferences, debates, projects, etc. is disseminated through social networks, which facilitates communication and integration between interested individuals from among the representatives of other higher educational establishments. At the same time, application of special programs in the research environment gives opportunity to communicate in real-time mode, hold audio and video conferences, convey texts, images, files. Thus, with the help of special messengers, Viber in particular, students are able to quickly get advice on urgent issues. Therefore, at the research level, teachers and students are the initiators and active participants of information exchange.

Development of educational component of information and educational environment in the system of training of future masters in PE and Sports of NUPESU was viewed by us in active spread of network, remote, cloud, and smart technologies. Thus, university provides access to open educational resources. We consider open educational resources to be educational means that are freely accessible due to free license, and establishing access to such resources with the help of information and communication technologies.

One of the main tasks of the system of training of future masters is to create a system of combined learning with the possibility of continuous learning of students under conditions of competitive training process. At the educational level, part of information and educational environment is distance-learning courses, which integrates web resources of a discipline with a single pedagogical scenario. Taking into account the advantages of the Moodle platform, which is a modular object-oriented dynamic learning environment and is a free and open system for managing the educational process (Chernihiv 2019), NUPESU has started to develop and implement

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distance e-learning courses. In order to ensure combined learning, the university's teaching staff is focused on creating an open network of educational resources. In fact, assurance of free access to e-educational resources for future specialists in physical education and sports, many of whom are actively engaged in sports, will help to eliminate the problem of students missing classes during the training and competitive period and to ensure systematic and continuous learning.
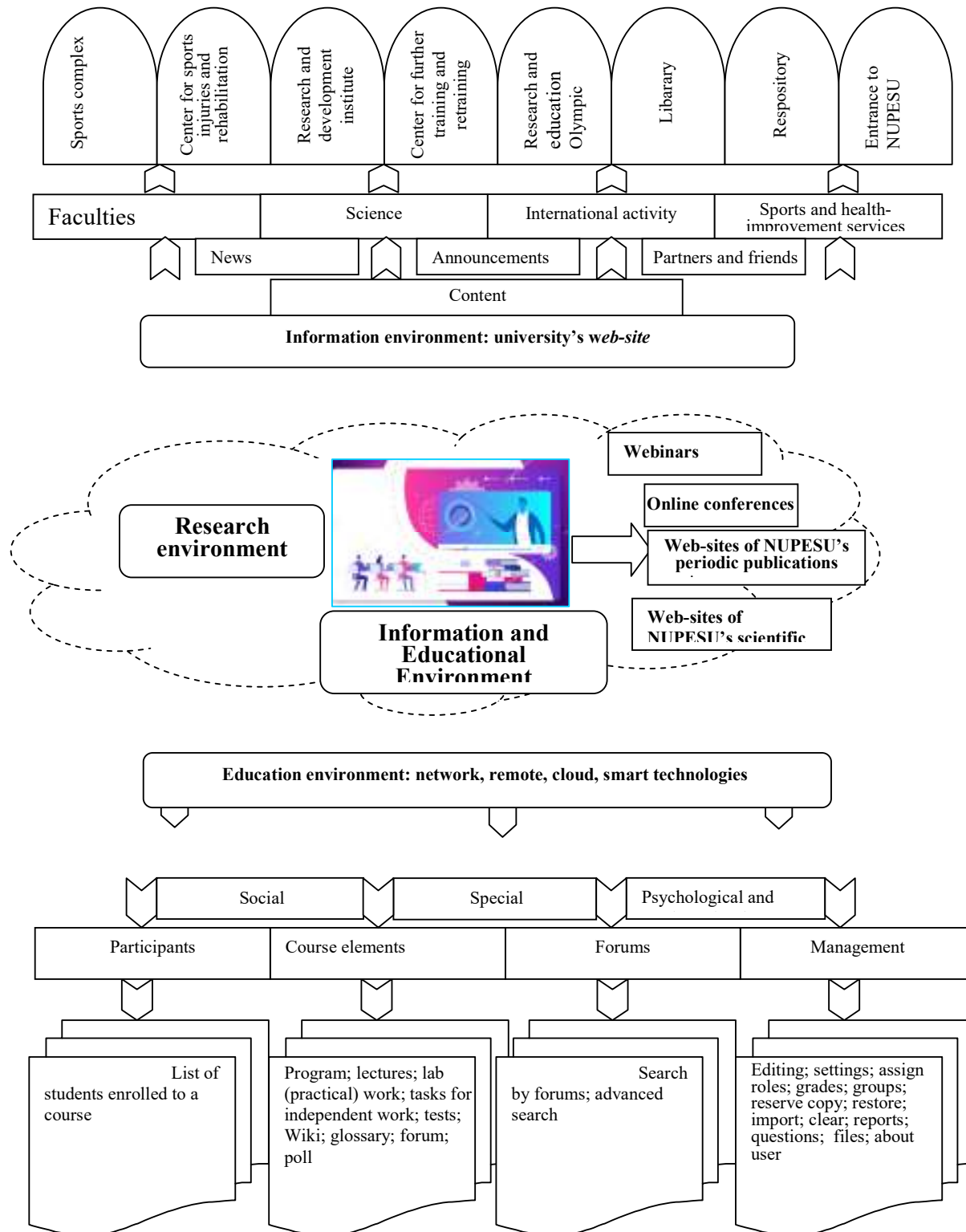
Fig. 1. Constituents of content and technological component of information and educational environment of NUPESU in the system of training of masters in physical education and sports at "teacher-student" level

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Gradually, the ideas of SMART and STEAM education penetrate the system of training of future specialists in PE and Sports. It should be noted that in the course of SMART-education, implementation of educational activities takes place in an interactive information and educational environment with use of free electronic information resources (Gurevich, 2016), while STEAM-education envisages construction of educational and cognitive process on a multidisciplinary basis of real-life problem situations (Andriyevska, 2017). Therefore, open educational electronic resources are used as an information basis for ensuring effective management of cognitive activity of students from NUPESU (Kashina, 2018). Thus, both during class work and in the course of self-development, students have an opportunity to use open educational resources, which provides access to international scientific and educational resources. In the classroom, access to educational materials is carried out due to using a SMART board, which allows application of tested methods and techniques of working with a regular board and combine them with a set of interactive and multimedia opportunities (Tverdokhlib, 2017). Instead, the use of multimedia interactive content for modeling and visual presentation of complex processes, in particular, the biomechanics of the movements that make up the content of the training of future masters in physical education and sport, greatly simplifies students' perception and understanding. However, BYOD technologies are used in educational process, i.e. the use of the arsenal of a modern undergraduate student (tablet, smartphone) as an additional source of information when performing various tasks, including classroom work, which stimulates students' curiosity and motivates them to expand their knowledge independently.

The following online services have a significant potential for improvement of the system of training of future masters in physical culture and sport: Google Docs, Office Online, Zoho Docs, Teamlab Office, QuickOffice, iWork, ThinkFree, Gliffy, Documents to Go, DocMe, Dropbox, Google Drive, Microsoft OneDrive (Denisova, 2018; Shelestova, 2018). At present, within the framework of solving the issue of improving the quality of education of students from NUPESU, experimental implementation of "Cloud Technologies in the System of Training of Future Masters in Physical Culture and Sport" course is ongoing (Vyshnevetska, 2017).

Therefore, summing up, it should be noted that at the educational level, subjects of education are active participants in the process of creating an information and educational environment of a higher educational establishment.

Discussion.

Tackling of the issue of setting the level of and quality of educational potential in accordance with requirements to Ukraine's innovation development staff is to be done via formation and implementation of information and educational environment in the system of training of future specialists (Lyubarets V.V., 2019).

Noting that under conditions of a developed information society, the main strategic resource is information; H.S. Kashina (2018) points out such advantages of open educational systems as improvement of the quality of educational process as a result of development of activity and learning forms of learning, and notes that the use of electronic educational resources in teaching practice opens up prospects for improvement of forms of classroom and independent learning.

However, studying conceptual approaches to the construction of integrated solutions for education under conditions of a developed information society, we paid attention to insufficient level of analysis of the issue of peculiarities of designing and development of information and educational environment of a higher educational establishment oriented on physical culture. At the same time, there are several problems in the system of training of future masters in physical education and sports, tackling of which is to be done via advanced educational technologies. Primarily, through introduction of combined learning, it is possible to solve the problem of organization and support of educational process, improvement of efficiency of students' educational activities through introduction of various telecommunication means (Kobysya, 2017). On the other hand, as professional activity in the field of physical culture and sport involves knowledge of the laws of mechanisms of the development of physical qualities and the formation of motor skills, techniques of exercise, the use of multimedia technologies allows you to visualize and make educational material more understandable. In addition, use of e-learning resources helps to ensure continuous learning during students' training and competition period. Thus, importance and relevance of development and implementation of information and educational environment in the system of training of future masters in physical culture and sport becomes clear.

According to ideas of S.V. Titova (2014), which we totally share and support, a modern higher educational establishment cannot function without a website, which performs many educational, information and communication functions in the society. The growing role of a higher educational establishment's web-site as an information basis that provides educational and methodological support for all types of classroom and extra-curricular student activity has been noted by such researchers as I.S. Pichugin (2017), M.O. Topuzov (2017), I.V. Pereguda (2018). At the same time, as I. Domanetska (2016) notes, in order to solve the problem of successful functioning and development of information and educational environment of a higher educational esatablishment, it is necessary to develop provisions and standards of information and communication technologies, a course of web-resources assessment program, as well as a cyber-security program. These tasks are also relevant for the training system for physical culture and sport. Obtaining composed information on a

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given topic, which is grouped and placed on relevant web sites, preservation and transfer of the main share of the studied material through educational electronic publications open up the prospects for improvement of educational process at a higher educational establishment oriented on physical culture. At present, efforts should be concentrated on standardization of electronic educational resources and assessment of their quality in the training system of future masters in physical education and sport.

According to V.V. Lyubarets V.V. (2019), intensification of international education exchange, increase of openness of educational systems of the world, their interconnections in Internet information space give additional opportunities for a more effective integration of education of Ukraine into the world academic process, which is extremely important for the sphere of physical culture and sport. In fact, access to the world's assets in the given field makes it possible to study and analyze advanced technologies, adapt them to domestic conditions, and implement them in training of highly qualified specialists capable of acting under conditions of a developed information society.

Dynamic development of information and educational environment of a higher educational establishment oriented on physical culture can be ensured by efforts of all structures and units of educational activity (Kizim, 2017). In particular, in the context of our research, subjects of educational process play a decisive role in addressing this issue. On one hand, in order to ensure quality of education in a developed information society, a teacher of a higher educational establishment produces and disseminates socially relevant information and outlines ways to seek information from external sources in the process of accumulation, analysis and rethinking of information, pedagogical experience and personal growth. On the other hand, a student absorbs, realizes and processes information, expands and complements knowledge, which results in professional formation of a master in physical culture and sport. It should be noted that educational goals can be achieved only under condition of combination of resources with motivation of the participants in the educational process.

Conclusions and perspectives of further research.

Solution of the problem of training of future masters to live under conditions of a developed information society has been shown via orientation of a modern higher educational establishment on design, construction and development of information and educational environment with further integration into a single information and educational space.

Due to theoretical analysis of the research issue and its conceptual and categorical apparatus, the author's interpretation of the concept of information and educational environment of a higher educational establishment oriented on physical culture, according to which significant environment is given to information flows of educational orientation in the "teacher-student" subsystem the indicated environment is an information flow. Here, there is circulation of information of sports and pedagogy character, producers and consumers of which are the subjects of the system of training of future masters in physical education and sports, united via network, remote, and cloud technology with the aim to fully implement student's potential and select individual educational trajectory.

When presenting materials of the research, we have shown a functionally designed and implemented information and educational environment in the system of training of future masters in PE and Sports. It should be noted that information and educational environment of a higher educational establishment oriented on physical culture, as well as of any higher educational establishment, includes content, organizational and technological components. It has been determined that the content component includes information resources and electronic educational and methodical materials; the organizational component is to tackle the issue of providing management of information and educational environment; technological one contains software and technical means for interaction of participants of the educational process.

Areas of application of Internet social services, social networks, mobile access, cloud services at the information, educational and research levels of information and educational environment of NUPESU have been outlined. Moreover, key role in tackling the issue of functioning and development of information and educational environment is played by subjects of educational activity, in which both teachers and masters act as initiators and active participants in exchange of information, its production and consumption.

Further on we intend to develop a method of combined education of masters in physical culture and sport under conditions of a developed information society.

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