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TÍTULO: El trabajo individual de los estudiantes en entornos de aprendizaje electrónico contemporáneos.

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RESUMEN: El estudio es relevante, ya que el papel y la importancia del trabajo individual de los estudiantes aumentan a medida que los modelos modernos de aprendizaje y las tecnologías de la información y la comunicación en red se introducen en la educación professional; por lo tanto, existe la necesidad de evaluar el grado en que los estudiantes son independientes y se motivan a sí mismos, y son capaces de trabajar de manera autónoma y eficiente en el contexto de la mayoría de los modelos actuales y el desarrollo de mecanismos para controlar el trabajo individual en estas condiciones. Se presentan los resultados obtenidos indican que la mayoría de los estudiantes no son lo suficientemente independientes, así como que no están automotivados adecuadamente y no se autogestionan en el aprendizaje.

PALABRAS CLAVES: trabajo individual, e-learning, entorno de red, cogestión, tecnologías de la información y la comunicación.

TITLE: Individual work of students in contemporary e-learning environments.

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ABSTRACT: The study is relevant since the role and importance of the individual work of the students increase as modern models of learning and information technologies and networked communication are introduced in professional education; therefore, there is a need to assess the extent to which students are independent and self-motivated, and are able to work autonomously and efficiently in the context of most current models and the development of mechanisms for control individual work in these conditions. The results obtained show that the majority of students are not independent enough, as well as that they are not self-motivated and not self-manage in learning.

KEY WORDS: individual work, e-learning, network environment, co-management, information and communication technologies.

INTRODUCTION.

Analysis of tendencies typical of Russian education over the past decade might reveal the two basic ones: multi-level step-wise informatization of educational process, and the entire education, and an increasing importance of individual work and its contribution into mastering educational programs of different levels.

Introduction of information technologies (IT) into pedagogic science and practice actually initiates a new stage in developing higher school didactics, being an important factor of integrating Russia into international educational space, and depends upon transition of the present-day society into

information stage of development, stimulating interest in students' autonomy level. In its turn, recommendations and direct requirements for improving and providing conditions for effective individual work (IW), developing independence and personal responsibility for learning outcomes are contained in the Concept of the Russian education modernization, National Doctrine of the Russian Federation education, the Sorbonne Declaration of European Countries, Federal State Educational Standards (FSES), and are fixed in professional standards.

Individual work, as an important form of the present-day learning process, is currently an essential tool for implementing new educational paradigm and a factor for improving efficiency of the entire educational process, and the most important basis for further informatization of education sector that is shown by the quality of students' learning results. Basically, these two tendencies are interconnected: IT tools may substantially affect learning process only when the students using them have proper IW level; in its turn, development of autonomy and new forms and methods of students' IW is based on the effects and results of the process carried out for complex informatization of education. Thus, the study is relevant since the role and importance of students' IW increase in the context of modern models of learning and network information and communication technologies in the professional education. The study is aimed at assessing the degree to which students are autonomous and self-motivated, and capable to work independently and efficiently within the present-day conditions, and developing mechanisms of managing individual work.

There is almost constant attention paid by analysts to the quality of students' individual work (SIW) and conditions required to ensure its high efficiency that is associated with further introduction of informatization tools into higher education institutions (Prokhorova & Nikitina, 2008; Solostina, 2014; Nikolaeva; 2011), potential didactic and technical capabilities of information and education environments (IEE), information and communication (ICT) and distance learning technologies (DLT) (Bozhenov & Damrin, 2014; Kolesova, 2013; Kozlova, 2001; Kuvshinova, 2016), with their role in

organizing SIW and improving efficiency of its management (Zakharova, 2017; Strekalova, 2016; Eluzarov, 2005; Zaiceva, 2002; Beloborodova, 2010; Kevlov et al, 2012; Kulikova, 2010).

Stepwise shift of learning process (and the entire education, in some cases) towards network environment in the context of developing not only traditional, but also creating innovative theories of learning, brings new momentum towards analyzing individual work and principles of its management in particular. The role and position of students' independence and their IW skills in contemporary theories shall be considered.

DEVELOPMENT.

Materials and methods.

To cope with such massive task, a complex study was needed through the major methods that involved pedagogic experiment, inter disciplinary analysis and synthesis of scientific sources related to the problem, generalization and extrapolation of the results, modelling, observations and interrogations aimed at attaining a desirable goal.

As follows from the analysis, a theory of learning in digital era (otherwise speaking, a theory of connectivism) suggested by G. Siemens and S. Downes is currently one of the modern theories of learning. Connectivism is actually a basis to understand a new approach towards learning, rather than a theory of teaching (Gureeva & Kozmina, 2014). Educational community in connectivist model, with its origins going back to constructivism of L.S.Vygotsky, is described as a node that is always a part of the larger network. Nodes are formed of those connection points that are inside the network. The network consists of the two or more nodes connected to share the resources (Downes, 2007). Hence, G. Siemens suggests that learning should be considered as a process occurring in an "uncertain, changing, and dynamically developing environment".

In describing the theory, S. Downes notes that learning implies incorporation of network into it (Siemens, 2018; The Knowledge Hunters by Stephen Downes, 2018). Students independently

progress in their learning, interacting with the practices, starting from copying the models. This process of "copying the activity" is supported by reflection and corrected by the other members of community. Interestingly, a community is primarily a basis of the network, and resources (being usually of value) are secondary. Only personal knowledge forms network facilitating development of community that in its turn facilitates development of network and, through its developing, a learning process of the other members (students).

Learning shows up as a process of transforming knowledge into sense and action through interaction with the other persons involving a teacher as well. As is obvious, the authors of the theory give a principal focus on the capability of students to independently find the required data and organize their own individual work with these data bearing personal goal-setting in mind.

In practice, ideas of connectivism imply introduction of e-learning technology that is based on the concept of large-scale cooperation, ideology of open educational resources (OR), coupled with network organization of independent interaction between the members (students). In its turn, e-learning is based upon ideas of "horizontal" learning activity and collaborative learning (i.e. learning and teaching according to "peer-to-peer" model) as opposed to traditional pedagogy and andragogy.

A concept of "peer-to-peer" model is currently deemed a perspective direction in the higher education. E-learning uses this model through ICT, i.e. students interact in the mode of learning community, contributing (to the extent possible) to addressing common problems. Here, this refers to "controllable" communication to master educational programs. However, it should be noted that implementation of a "peer-to-peer" model in question requires active interaction between its members (students), self-motivated and capable of working independently, setting themselves goals, and developing measures to attain them. Thus, there are two learning models in e-learning with ICT capabilities used to the maximum: individual and personal (Nagaeva, 2013).

An individual model of organizing learning process is based upon personal interaction of a teacher with only one student. Within the process, psychological and pedagogical conditions for teaching and developing such student are created bearing his personality traits in mind. This model implies management on the part of a teacher-curator who is charting a student's learning path (learner, student), and, hence, ICT means (learning environments, training programs, network resources) play the role of a tool to enact a pedagogic scenario. This model takes into account that not all students have critical thinking and are capable for filtering off the scope of information that might be available on the Internet, learning resource data storages, or that particular information (teaching) community (a network made of communication nodes), which was formed under connectivist concept (model), hence, actions of a teacher play the required leading role.

At the same time, this model of learning is advantageous since there is an opportunity to adapt content, methods, and paces of learning activity of a student taking into account his personal traits. Finally, it will enable to achieve high results in mastering educational program. Here, it should be noted that, when using such model, e-learning and ICT means will enable a teacher to fulfill functions of a controlling educational interaction with a broad audience (students). However, it should be pointed out that despite a substantial role of a teacher as an organizer of a student's individual work, further on it will be a student (learner, pupil) who will be involved on his own in cognitive activity according to the suggested learning path.

The model of personal learning is even more independence-driven since it is based upon the attitude of a student himself towards his education, i.e. on its personal understanding that there is a need for studying according to a certain educational program, obtaining a specific information for himself. Advantages of this model pointed out by analysts involve independence in managing own learning process; autonomous procedure when determining and formulating learning goals; organization of learning at a self-defined pace depending on surrounding conditions; development of a personal work

plan, within which a student chooses only unknown items for learning; possibility to individually communicate with a teacher; potential enrolment into a study group with students of various learning levels; constant control over internalized knowledge.

Results.

Generalization and extrapolation of the obtained results enabled to note that, when presenting independence as a major advantage of this model, there should be a clear understanding of students' having enough and adequate level of their independence developed (as a personal trait) to use this model in their learning process (self-learning). An undertaken pilot study has shown that when a group of students starts to use personal model of learning, their activity in studying decreases by 22-24%, and a share of assignments made decreases from 87 to 57,5%, especially, within the two first months.

When analyzing organizational component for personal education model, it is noted that a personal learning environment (PLE) is needed to implement it, that involves tools, communities, services, and the whole complex of resources needed for deploying and functioning of individual educational platforms intended to be used by students. Thus, typical personal learning environment (Personal Learning Environment, PLE) may involve learning blogs, video web hostings (of YouTube type), information agencies news feeds, approaches to social networks and resources; i.e. such PLE creates conditions for a student to individually manage the process of its learning and set learning goals.

A special approach to learning is pursued here as well. According to I.Illich, an ideal educational system may be presented as a "learning web" that assures access to available resources at any given time irrespective of their age (actually, an existing system of education management, by LMS Moodle type); providing an opportunity to all those who want to share their knowledge and skills, find those who want to acquire their knowledge; enabling to submit its learning outcomes for consideration (Illich, 2006).

In developing ideas of personal learning, C. Freinet goes further, suggesting to present learning as a solution to specific problems, analysis and expertise of situations, replacing assignments by questions, students ask; using personal suggestions instead off grade marks, and considering mistakes as “misunderstandings”. At the same time, such freedom of actions in learning network with no plans, teachers, and organized group of students, suggested by Freinet, shall in any case be based upon “individual and group planning”, availability of a curator (teacher) sharing in the “common cause”, solving “common problems” in the context of community, to be governed, as per Freinet, by community life rules accepted by students themselves (Frene, 1990). Perhaps, such an approach may be implemented in the context of a school correspondent network as a network for exchanging learning and social information between educational organizations, however, it is too soon to regard it as an integral learning system.

Too many components in such a learning model depend directly on the level of a student’s autonomy and awareness, his motivation, understanding those goals, he plans to attain, and capability to individually set such goals. Unfortunately, our study shows that only 31.6% of students are consciously independent when mastering modules of learning program in the mode of e-learning. The level of teachers’ autonomy also remains low, of 47,1% (according to the results of teaching staff continuing education using distant learning technologies). At the same time, as per the results of interrogation, 83% of students made it clear that they are ready and want to study using DLT, and 67,3% among them indicated their high degree of autonomy (teachers – 88,2% and 77,1% respectively).

One more model based on ICT tools and a student’s autonomy, is a so called “horizontal model of collaborative learning” (P2P-learning, peer-to-peer), practically implemented in the context of Peer 2 Peer University (P2PU) Project. Actually, P2PU is a model of open education based upon organizing extramural learning process out of traditional higher education institutions, that enables

students to assess their accomplishments on their own.

It is further noted that development of open online courses (massive open online courses, MOOC) of diverse topics, with a certain government support received (On priority projects in the area of education, 2016), and introduction them into professional education are currently among the modern trends. Hence, MOOC are implied as a tool for expanding capabilities of e-learning (EL), taking open access to the suggested content into account, furthermore, they provide opportunities for implementing new Learning-models, which involve components of open education. The presented P2PU model is based upon using such open educational resources. To this effect, an open group network community shall be created to study modest-sized online courses. Coursera, edX, Udacity, Courseware, OpenCulture, «Universarium», «Lectorium», «Intuit», «National Platform of open education» may be regarded as examples of such platforms, each of which has its certain behavior pattern. Despite an apparent "openness" and stated autonomy, learning using P2PU model needs management: thus, prior to lessons, a preliminary plan of learning is prepared; students may create groups and jointly search, learn educational resources, discuss and do assignments on selected subjects and courses; final assignments shall be verified and assessed by an external expert (Dochkin, 2017).

Previously analyzed models, technologies, and approaches to organizing e-learning impose no restrictions on its capabilities. Thus, for personalized learning such new direction as rhizomatic learning is recommended, according to which a cognitive learning path constitutes a "growing branch" with no beginning, center, and end. Here, a student's activity principle is as follows: "learn only information of interest and importance for him right now" (and identify what is important right now, the most important and complex items). Except for rhizomatic learning, a new "mobile campus" concept appeared in e-learning. It is a set of tools, network services, and pedagogic technologies as part of mobile learning, that enables to combine non-formal and social types of learning activity with

formal studies in a conventional higher education institution (Travkin, 2012).

It should be emphasized that almost all studies using distant learning technologies (DLT), and they are the focus of the present-day e-learning, are pursued in an open communicative space through interactive lessons that creates both extra opportunities for analyzing learning outcomes, and challenges in organizing efficient learning. It stands to reason that the created "friendly environment" facilitates free communication between students, teachers, other persons taking part in learning process, interacting to attain learning goals; however, imposes requirements for activity, its users are involved in.

As is clear from the study conducted, all innovation e-learning models are highly dependent on the effectiveness of a student's individual work and efficiency in his using ICT tools. This dependence shall be defined by a need for making an independent search of information in networks, network libraries, banks, and databases and process the information found (according to an individually identified goal); properly transform IW, discuss revealed problem situations on thematic forums, and exchange learning materials taking an active part in the process.

At first glance, it positively affects the formed tendency for students' classroom hours to decrease and share of students' IW to increase that is currently defined by changes in learning goals, pursuant to which a student instead of passive internalization of knowledge shall learn to independently "acquire" them, that will further facilitate development of professional mobility and self-learning/self-improvement. Indeed, all analyzed models suggest that open learning environments that provide information and aimed at students' creating their own individual knowledge should be used. Such environments involve open ER, and network technologies and Internet services as technical training aids. And, thus, IW of students, who use self-study, network cooperation, and co-creation methods as the key learning methods, became the main and almost the only organizational form of learning in such conditions. There are changes in a teacher's activity as well.

Now, his basic function involves designing, creating, and presenting educational resources in network environment that are in compliance with learning subjects. A teacher's second function shall involve coordination activity to select and offer various learning paths to students. Here, the level of a student's self-organization provides for effectiveness of his work in an open learning network environment (OLNE).

When analyzing network models of learning deployed in the form of educational environments, it can be said that it is students' individual work that is a system-forming factor in presenting them as a pedagogic system. Moreover, there is an integration of basic viewpoints to a student individual work that implies both a student's activity with no teacher's taking part in it, and a specific form of organizing learning process. For example, N.B. Strekalova suggests that IW of students in network environment should be regarded as a special type of exploratory activity and a specific form of learning that requires supervision and management (Strekalova, 2016).

Discussion.

An analysis of studies and results achieved after having practical experience of using ICT when forming open network educational environments in pedagogic theory and practice allowed to find out not only advantages and strengths of learning process in network environment, but also a number of serious risks that may lead to uncontrollability of the entire learning process, development of dependence on information and information overloading of students, shaping "mosaic thinking" in them, decreasing level of their analytical abilities, and, finally, to moving away from the desirable educational goals.

Such risks involved the following: potential deviation of the obtained learning outcomes from the planned ones; not self-maintained and/or not complete execution of works, delayed submission of works to be verified; probable simplification of assessment criteria that leads to reducing quality of fulfilling assignments; technical failures when delivering works and messages, distortion of

information therein; probable deviation from planned goals of learning and acquisition of unplanned knowledge and competencies to the detriment of the planned ones (required), reduction of possibility to systemize knowledge and develop capabilities of students; acquisition of insufficient and/or inadequate information; occurrence of interpersonal misunderstanding, uncoordinated actions of students and teachers (tutors, curators). It is worthwhile to say that one of the reasons for appearance (sources) of most risks lies in lack of a student's readiness to work individually and efficiently, and lack of indirect management of his activity. Occurrence and manifestation of these risks or their part may finally result in incorrect execution of the entire work, distortion of initial requirements, growing dissatisfaction of students over the entire organization of IW, dissatisfaction of teachers over IW quality, and eventually to failure in obtaining educational results of the desirable quality.

An increase in share of students' IW in learning process and a shift of studying towards network results not only in raising the level of the required autonomy of those using educational services and increasing freedom of choice and activity, but also in a need for accounting and controlling spontaneity in actions. A spontaneous nature of students' activity in internalizing education materials is defined by possible sudden change in a pace and a sequence of learning activity, impact of surrounding conditions and life situations where a student is in, his personal traits, available experience of solving arising problems and overcoming difficulties (Drobyshevsky & Zhelezovskaya, 2001).

Our studies have shown that when reducing the number of "control" measures and a strict procedure for doing training modules and subjects, a degree of internalizing subjects decreases by: 27-29% when studying special cycle disciplines and 31-33% when studying humanitarian disciplines. Students shift away from recommended learning paths developed in compliance with the requirements of standards and employers-partners, and try to choose less time-consuming and simple in mastering learning components of a course. Correspondingly, here, a need for controlling IW both

on the part of a student, and teachers (authors of the course) as well, ranks first in importance of organizing e-learning IW.

Here, with the special features of network environment in mind, it is self-management of a student's IW as his conscious influence over himself to effectively use his own capabilities, potential, and skills that is a key aspect in the process of organizing individual work. According to T.A. Dvornikova, B.G. Yudina, Y.S. Manuilova, N.B. Strekalova, L.V. Nikolaeva, to ensure proper and effective IW within e-learning concept, it is required to develop students' skills and abilities in self-motivation, self-organization, self-control, and self-assessment (Strekalova, 2016; Manuilov, 2008; Dvornikov, 2007; Nikolaeva, 2011).

Our studies have also shown that a teacher's role when organizing students' IW in network environment shall not be diminished as well. In conditions of e-learning, organization of students' IW suggests that a teacher should handle a number of important management tasks in:

- Planning (statement of learning goals, list of competencies to be learnt, content and type of assignments, development of subject-wise plan-schedule);
- Ensuring methodological support (preparation of methodological materials, technological maps, selection of additional online educational and information resources);
- Ensuring technical support (preparation of methodological materials in network environment-adapted format, development of individual learning paths (ILP) and routes; determination of students' feedback elements; preparation of links to information resources and verification if they are valid);
- Coordinating and interacting (organization of chats, forums, potential interactive dialogue and online-monitoring of work progress; schedule of collaborative actions, work in groups);
- Control over outcomes: determination of quality-quantity criteria for assessing works, types of reporting, control forms and time, development of a system for informing students of their accomplishments and mistakes made.

It was concluded that a shift in students' IW towards network environment enables to consider IW management process differently as a process. Identifying actions of a teacher to organize students' IW in network environment as pedagogic management function fulfilled, it is worthwhile mentioning that its effectiveness considerably increases due to integration with self-control functions carried out by every student. Here, this function of coordinating and interacting collaborative activity is of central importance, being a connecting link to integrate these components [28- 30] (Nikolaeva, 2011; Yasvin, 2001; Setianingsih et al, 2017).

Considering students' IW management processes as a combination of pedagogic management on the part of a teacher and self-management generates new approaches to using and interpreting "collaboration", "co-creation", "co-management" concepts that can create comfortable conditions for creative self-fulfillment of students. Actually, e-learning allows to practically transfer co-management principles to students' IW, thus, ensuring effective network cooperation and co-creation of teachers and students (learners, pupils), coordination of their collaborative network activity, efficient self-organization of cognitive activity to obtain learning outcomes.

Present-day models of managing students' IW in network environment shall involve an integrated complex of components that ensure functions of pedagogic management (on the part of a teacher), self-management (on the part of a student) and co-management (on the part of a teacher and a student). It is the combination that will enable to mitigate arising risks identified previously. In the course of studying the problem in question, students' IW management model was amended by input business processes ensuring preparation of a teacher for IW organizing in network environment, preparation of students for individual work in e-learning mode, determination of the initial level of readiness of those participating in management process to address problems; by output business processes ensuring conducting evaluation procedures, monitoring management process and correcting controlling actions that assure handling management tasks and achieving learning result.

CONCLUSIONS.

The process of shifting student's IW and the entire educational process towards network educational information-intensive environments, typical of the recent conditions, requires changing approaches to individual work, earlier understood to be made with no direct involvement of a teacher in a student's activity. Furthermore, the created conditions typical of e-learning, namely, an increase in the scope of materials suggested to be internalized, and ITE variability as well; possibility for working (studying) anywhere whenever convenient; expansion of the role of channels for communication "students-teacher" interaction; danger of information overloading and manipulating the behavior and perception of students make studies for improving methods of managing IW and ensuring IW quality necessary.

One of the major approaches to improving effectiveness of individual work is to develop and introduce effective models for management of this process, based on interconnecting management activities performed by teachers and students, and to ensure co-management of the process.

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