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Organizational and methodological support for training technical university students using web platforms

Soporte institucional y metodológico para estudiantes de universidades técnicas a través de plataformas web

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Contents

ABSTRACT:

The article analyzes educational activity in the electronic environment, using systemic and structural-functional approaches. The didactic materials are developed using philosophical, psychological, pedagogical, and methodological literature, and advanced universities' experience. The effectiveness of web quest, online crossword puzzle, network project, electronic simulator, virtual museum, virtual library, virtual cafe, and virtual laboratory is tested. Application of results in the education increased motivation for learning activities and student-teacher communication effectiveness; developed students' skills of planning and organizing studying and research activities.

Keywords: learning environment, information technologies, blended learning, Moodle

RESUMEN:

El artículo analiza las actividades educativas en el entorno electrónico utilizando enfoques sistémicos y estructurales funcionales. Los materiales didácticos se desarrollan utilizando literatura filosófica, psicológica, pedagógica y metódica y las mejores prácticas de las universidades. Se comprueba la efectividad de la búsqueda web, el cruce de palabras en línea, el proyecto de red, el simulador electrónico, el museo virtual, la biblioteca virtual, el café virtual y el laboratorio virtual. La aplicación de la tecnología de la información en la educación ha aumentado la motivación para las actividades de aprendizaje y la eficacia de la comunicación entre estudiantes y profesores; asimismo desarrolla habilidades de planificación y organización de las actividades de aprendizaje e investigación.

Palabras clave: Ambiente electrónico de enseñanza, tecnologías de información, enseñanza mixta, Moodle

1. Introduction

The processes of networking and digitalization of society are in the center of attention of the

world community. Thus, for example, it was noted at the Cancún Ministerial, in which the representatives of 43 countries participated, that "The way to a better future, growth, and prosperity is linked to wide implementation of new technologies" (OECD, 2017, p. 22).

The networks in the new online format create a new communicative environment for a modern person (Shchenina, 2018). In this regard, in the scientific literature the idea of creating educational environments with open content and free access to the achievements of mankind is expressed (Jhangiani & Biswas-Diener, 2017, p. 7; McGreal et al., 2012, p. 748).

Today, it is not at all sufficient for a teacher to master computer skills and be able to access the Internet; serious methods and technologies for using information resources in the learning process are required (MacKinnon & Bacon, 2015, p. 190), as well as estimation of each e-textbook, a networked resource, and university choices (Rennie, 2016, p. 20; Hilton, 2016, p. 573). Moreover, information and communication resources are currently not just a system of technical tools and means. In the authors' opinion, they are today "theoretically loaded". Therefore, they are often interpreted in the scientific literature as a paradigm, that is, a kind of initial conceptual scheme, a model for posing and solving problems, and their adoption is still rather slow (Mishra, 2017, p. 369).

E-education is successful when adapts "to a continuously changing environment and shifting community needs" (Petrides & Jimes, 2008), Free and Open Source Software (FOSS) (Gupta & Surbhi, 2018, p. 54), proper decision making (Yuan and Powell, 2013), and the openness of educational practices (Santos & Okazaki, 2013, p. 363; Warden, 2016, p. 224, Chiappe & Adame, 2018, p. 213).

Analysis of the scientific literature allows making a conclusion that the main aspects of the specifics of teaching social and humanitarian disciplines in a technical university using the innovative electronic environment are not fully described in these works (Jackson, 2002, p. 65).

The purpose of this study is to develop and conduct theoretical analysis and experimental verification of the most effective forms of students' learning activities in an electronic environment based on the practical experience of the Ryazan Polytechnic Institute and international universities.

The hypothesis of the study: the study of social and humanitarian disciplines in a technical college will be more effective if learning and research activities of various forms are organized in an electronic learning environment; the necessary conditions for this are developing electronic courses in philosophy, sociology, law, a foreign language, and the history of Russia, and compiling sets of didactic materials.

The questions of the study: how does the motivation to study social sciences and humanities change as the e-learning is involved in the process? What forms of students' activities in the e-learning environment contribute to the effectiveness of the educational process at the university? What is the subjective attitude of students to the forms of individual and collective activity in the electronic learning environment?

Considering the above, over the past four years, a portal of distance education support based on the Moodle system has been created at the Ryazan Polytechnic Institute. This allows for the transfer and acquisition of knowledge in electronic form using files, archives, and web pages. In fact, today this e-learning environment is an integral part of the educational space of the university. Here it is essential to clarify the content of the concept of "electronic learning environment", as it is often used or mixed with the following concepts in scientific and philosophical discourse: "digital educational space", "electronic educational space", "digital educational environment", "information-educational environment", and "electronic-digital educational space".

The electronic learning environment (ELS) provides quick access and work of users with electronic educational resources (external and internal) through the use of information and communication technologies. All participants in the educational process interact in it, which makes it possible to implement various possibilities of distance education technology (DET) and e-learning. This new type of reality in the field of education is, in its essence, an open set of information systems designed to support various tasks of the educational process.

"Open" means the ability and the right to use various information systems as part of the ELS, replace them or add new ones at one's own discretion.

What does this environment consist of? It includes e-courses on studied subjects with text documents for lectures and seminars, as well as independent work of students (IWS); in digital form, photographs, video clips, virtual reality and interactive modeling objects, cartographic materials, sound recordings, symbolic objects and business graphics, as well as other educational materials necessary for organizing the educational process.

The task of this study is to consider the main forms of work in this environment to study the following social and humanitarian subjects: philosophy, foreign (English) language, law, history, and sociology.

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2. Methodology

The study was conducted on the basis of the following methods: a systematic approach, analysis of philosophical, psychological and pedagogical literature on the topic, observation, questioning, comparison, and best practices.

The methodological basis of the study is as follows: a systematic approach (Bespalko, 1971); activity approach in education (Vygotsky, 2008; Leontiev, 2010; Rubinstein, 2003); and the theory of the gradual formation of mental actions (Talyzina, 1984; Galperin, 2002).

The survey was carried out from 2015 to 2018. At the *first stage* (2015-2016), philosophical, pedagogical and psychological literature was analyzed, the purpose and tasks of the study were stated, the working hypothesis was formulated, and the program of the survey was compiled.

At the *second stage* (2016-2017), a set of electronic tools and didactic materials was created, and students' learning and research activities were organized on the distance education support portal.

The final *third stage* (2017-2018) was devoted to summarizing the experience of students and teachers' work in the electronic learning environment, conducting a survey in the form of a questionnaire, and analyzing the obtained data.

In October-November 2018, a group polling of the students of the specialties "Construction of unique buildings and structures" (200 people), "Land transport and technological means" (24 people) and fields of undergraduate training in "Industrial and Civil Engineering" (96 people), "Design and technological support of machine-building production" (63 people) was conducted. A total of 383 first to fifth year students of 8 mural and extramural training groups were interviewed (Table 1).

Table 1
Contingent of respondents

Areas of preparation	**Number of participants**
08.05.01 "Construction of unique buildings and structures"	200
23.05.01 "Ground transport and technological means"	24
08.03.01 "Industrial and civil engineering"	96
15.03.05 "Design and technological support of machine-building industries"	63
Total	383

Source: authors' development

The questionnaire included the questions related to identification of the motivation for learning activities in an electronic environment, the most popular forms of educational

resources, their evaluation from the point of view of practicality and ease of use in the study of disciplines (Annex 1).

While studying philosophy, law, or sociology, in the classroom and in their free time, students solve various types of learning tasks. Some of them require reproducing activity, according to clearly defined order. For example, control tasks in the form of questions, tests, or definitions of basic concepts of the course of philosophy. The other part of the tasks posted on the distance education support portal (the official website of the university) on the Moodle platform, in an electronic course on philosophy, stimulates the creative thinking of young men and women. They do not just solve educational tasks made up by the teacher but become active accomplices in the learning process (subjects). For example, the fulfillment of such a task in philosophy, as a commentary on judgments, aphorisms, at first glance, is in a completely free form. However, it is not so. In the appropriate guidelines, the teacher prescribes the sequence of student's mental actions:

1. identify the era (century) in which the author lived, the sphere of his or her professional activity;

2. provide the essence of the statement in your own words;

3. provide your attitude to the statement – agree, disagree, partially agree;

4. give justifications in favor of your point of view, or at least illustrate it with examples (from life, the field of science, technology, art).

The share of independent work with such an organization of students' cognitive activity increases sharply. The focus is shifted from the teacher's identity to the e-learning environment.

Another form of students' learning activity that stimulates thinking processes in them is working with the Glossary tool. This is an integral part of the electronic learning space. According to the teacher's instructions, students compare the content and volume (of two or more) of the basic categories of philosophy; illustrate the results of their analytical work with examples from life, from the field of science, technology or art. As a result, the program learning material is absorbed more deeply and thoroughly.

Structural-logical schemes for individual educational topics and sections have previously been actively used by the authors in lectures and seminars. For example, young men and women who study philosophy, sociology, or law, were asked to complete the scheme by entering the missing links. The experience of working with the schemes integrated into the electronic course is rather interesting. However, it is worth noting that the task – "Explain the structure of the scheme, the place of each element, functional relationships with other elements" does not commensurate with abilities of all the students.

Games are placed in the electronic courses of such disciplines as "Philosophy" or "Sociology". Positive ratings for successful participation are given on a five-point scale of assessments involved in the system. For example, a user can solve online Moodle crossword continuously in time, save his/her intermediate results, send partial solutions for verification, and, as the result, get a grade for it.

Webquest in pedagogy is a problem task with elements of a role-playing game, to fulfill which one uses information resources of the Internet. It is aimed at developing students' skills of analytical and creative thinking. Solving web quests in philosophy and sociology contributes to the development of the following skills: information retrieval, its analysis and selection of the main information, assessment of the information content of the material and interpersonal communication based on the information received; searching for several ways out of the problem situation, determining the most rational option, justifying one's choice. It is necessary to emphasize that research activity (as it is stipulated by the educational standard) that is one of the components of the activity of a civil engineer who constructs high-rise and unique buildings which is impossible without the above-mentioned abilities.

Examples of the quest aimed at determining the philosophical direction according to a typical judgment:

- “Nothing is in the intellect that was not first in the senses” is … (*Sensualism*).

- “Matter is the source of being” is … (*Materialism*).

After all, it is no secret that a rather large part of students “trust the Internet” more than textbooks and teachers, and even themselves. It is necessary to convince the students that the Internet itself is neither good nor bad. This powerful tool allows establishing new connections in human communities of various sizes and transmit information with unprecedented speed.

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3. Results

In practice, teachers face a reducing number of classroom hours in the social and humanitarian disciplines. The peculiarity of the subject “Foreign Language” in a non-linguistic university is the mastery of students’ communicative competence, that is, the ability to communicate in a foreign language on professionally oriented topics. An important component of modern education is the combination of traditional teaching methods with the use of modern information technologies.

Foreign specialists define this type of study as blended learning: “a combination of technology and traditional classroom learning based on a flexible approach to learning that takes into account the benefits of training and monitoring tasks in the network, but also uses other methods that can improve students’ results and save costs learning” (Banados, 2006); a combination of learning through personal communication (F2F) and programmed learning (CAL) in a single educational space (Stracke, 2010, p. 62).

When developing a foreign language course in a non-linguistic university as a part of blended learning, when, according to the curriculum, students have 2 lessons per week, a combination of Face-to-Face and Rotation models is used. At the same time, an equal ratio of traditional learning and e-learning is provided: one lesson is held in the classroom with a teacher, and the second is transferred to the electronic environment based on the Moodle system.

Learning is based on a parallel study of topics, both in the classroom and in the Moodle system. A student can find blocks of all those topics that are planned in the course work program.

The electronic course contains additional textbooks (student’s books), workbooks, and audio materials. As a rule, these are foreign textbooks that cannot be provided for students due to their high cost. For example: “Technical English: Vocabulary and Grammar”, “Technical English 1, 2, 3, 4” (student’s workbooks with audio files) for students majoring in technology, “English for the Automobile Industry” for students majoring in motor transport, and “Cambridge English for Engineering”, “Professional English in Use Engineering”, “Essential Business Vocabulary” for students majoring in engineering and construction. It should be noted that in the university’s e-learning environment, training materials are constantly updated and new courses are created, which allows making the learning process as effective as possible. In addition, the university e-course may contain a variety of types of work that cannot be implemented in the classroom, for example, asynchronous forums, chat rooms, wikis, video and audio conferences, and some others.

The proficiency examination is carried out using tests and assignments. Moreover, tasks can include not only “multiple choice”, but also such exercises where students formulate the answers independently, without any possible options provided. Such form of control helps to save time and focus on verbal communication.

A survey among students of the Ryazan Polytechnic University showed that an individual approach motivates students to further acquire knowledge. Working in comfort conditions on the basis of the Moodle system, students can regulate the process of learning a foreign language themselves.

The structure of the e-course contains theoretical material on English grammar. Any student can re-learn or repeat this or that topic. Ryazan Polytechnic University has developed several foreign language courses: “English grammar (basic course)”, “English for economists and

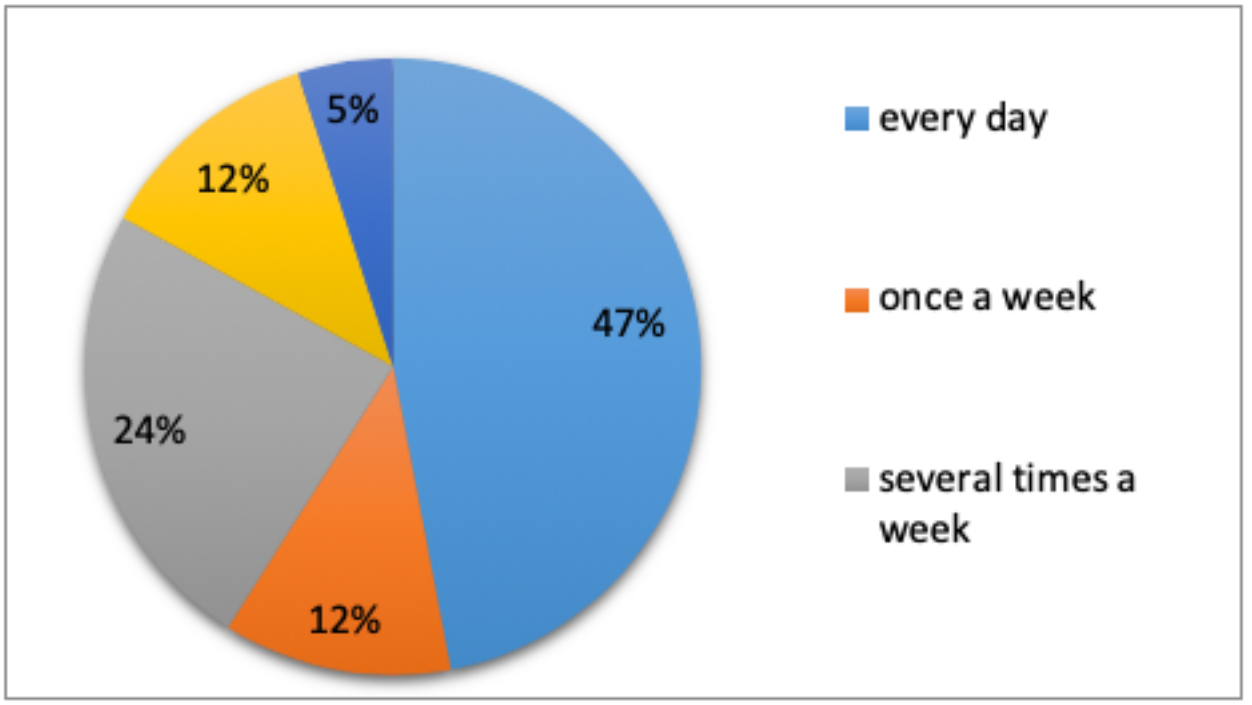
managers", "English for engineering builders", and "Technical English". Each course consists of four sections – "Reading", "Vocabulary", "Listening", and "Video". The "Reading" section contains texts on the specialty, articles from the foreign press, as well as various tasks for them. The "Listening" section contains many professional-oriented audio files. The component "Video" contains various videos, such as "at the interview", "at the construction site", "features of the work of the lathe" and others.

The practical section contains test tasks for all major sections. Each test has several levels of difficulty; the students choose the level available to them independently (Elementary, Pre-Intermediate, Intermediate, Upper-Intermediate). Of particular importance is the section "Vocabulary" as it contains basic professional terms.

E-courses on philosophy, sociology, law, and foreign languages include Internet links, guidelines for carrying out research projects, materials for independent study, types of creative tasks, including tasks for online academic competitions, and reference materials.

However, it is necessary to touch on the teacher's role in this type of work. In modern publications on pedagogy, such a notion as "joint work" is often found. In the historical network project, it allows a teacher to carry out continuous monitoring of the competencies generated by the students, creating the possibility of applying an interdisciplinary approach (Figure 1).

Figure 1
The frequency of students' use of electronic educational resources while studying social and humanitarian disciplines



One form of collaboration is a network project, for which each teacher can find a suitable online platform. To host network projects, various Web platforms are used, such as Netboard, DesignDrop, Ziteboard, MindSky, or Wiki. Let us show the didactic possibilities of some of these systems by the example of studying the discipline "History of Russia". Topic: "The operations of state mortgage banks in the Ryazan Province at the end of the 19th century – early 20th century".

"Personal Pinterest" – this is the name of the Netboard platform, an account that turns into any platform needed by the teacher. For students, it can be both a historical site filled with informative content and a scientific blog. The platform is intended for systematization and generalization of various information. One of its forms is the Virtual Historical Museum. In contrast to the similar "paper" medium, the search system is facilitated for visitors, and there is also the possibility of instantly saving information of interest (Kirton & Warren, 2018). Netboard allows implementing this project in the form of an album-catalog, as well as a three-dimensional model – a virtual tour of the halls.

Within the framework of studying mortgage lending at the end of the 19th century – early 20th century, the Virtual Historical Library was created. A set of documents is provided: annual reports of the Ryazan branch of the Peasants' Land and State Nobles' Land Banks,

final reports of mortgage institutions by periods of activity, Decrees and Orders of the Ministry of Finance and the emperor, accompanying statistical compilations (economic reports of the Ryazan Province by year and minute books of the Ryazan Province Zemstvo Assembly). (RSHA (Russian State Historical Archive); SARR (State Archives of the Ryazan Region)).

MindSky is used to summarize the text content. With it, it is possible to make a selection of feature articles, create a list of current tasks, reminders, sketches or notes. If a teacher needs to get feedback from students, *DesignDrop* service can be used. "Virtual Cafe", a web page for sharing research results, is a competent addition to the "Virtual Library" project. The DesignDrop platform provides research participants with access to comments from the submitted material and "drawing directly on the loaded picture". The ability to edit content makes DesignDrop the most appropriate portal for collaborative historical work in the field of cartography.

The results of the students' educational and research activities are placed in a scientific online newspaper. In this case, *Ziteboard* is the optimal service as it operates on the principle of a common online board. Its specific feature is the recognition of forms that a user wants to create. Using Ziteboard, students create thematic charts. One of the most relevant ones is the diagram "Fluctuation in the volume of operation of mortgage institutions in the Ryazan Province" and the table "Comparison of the volume of activity of the local branch with the Russian trend" (Plutenko, Leyfa, Kozyr & Haletskaya, 2018).

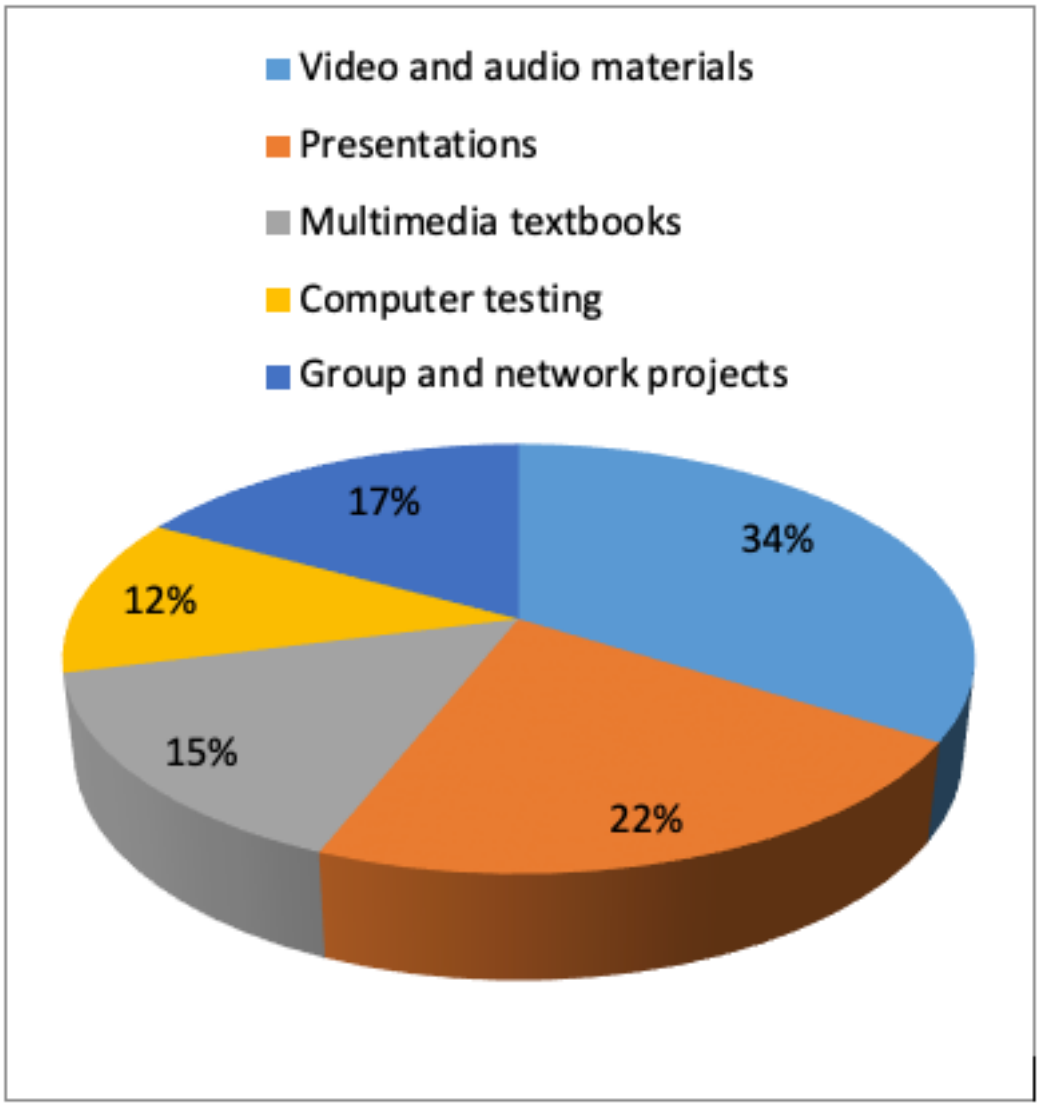
The toolbox of the Wiki platform allows teachers to change its structure and fullness, depending on the specifics of the discipline being studied. Students' research activity in the discipline "History of Russia" takes place in three stages: the analysis of archival documents, the fixation of the results obtained, and their presentation as the final scientific work. Let us consider them by the example of the stated financial and economic topics.

At the first stage, students have to work with the Report of the Ryazan Branch of the Peasants' Land Bank in the initial period of its operation (1882–1895). The Wiki platform service allows a teacher to make regular changes to the text through the functions of the system itself, and changes will appear immediately after they are made public. Wiki markup allows including necessary elements, links, and resources in a document. This may be a glossary, audio-video explanations, or links to additional sources. These opportunities are especially relevant at the final stage of teaching and research activities.

Due to the possibilities of the Wiki page, students can generate a common methodology for solving the tasks, accumulating the results of their own and joint development. Thus, analyzing the operations of the Peasants' Bank in the Ryazan Province requires processing a large amount of statistical data. In order to make work more productive, it is advisable to divide the year-by-year tables illustrating the number of loans issued by the institution among all participants of the research work.

Thus, within the framework of the "History of Russia" discipline, the functionality of Netboard, DesignDrop, Ziteboard, MindSky, and Wiki Web-platforms allows solving virtually any task. Here are just a few of them: creating a virtual historical museum, a thematic catalog of electronic archival sources and documents, own version of regionalization on a historical map, a thematic diagram, sketch or graphic; the implementation of the historical project makes relevant the problem of students' research access to the comments of the presented educational material, which is impossible without creating associative maps (Figure 2).

Figure 2
E-learning resources that are of
the greatest interest among students



Getting “feedback” from students on these platforms is possible through the development of a series of feature articles, a list of current tasks, reminders, sketches, notes, a virtual cafe, an Internet testing portal, or a web newspaper. The survey results indicated the following dependencies (Table 2).

Table 2
Students’ attitude to the use of e-learning (EL) elements in the educational process (in areas of preparation, %)

The attitude of students to the use of e-learning elements in the educational process	**08.05.01 “Construction of unique buildings and structures”**	**23.05.01 “Ground transport and technological means”**	**08.03.01 “Industrial and civil engineering”**	**15.03.05 “Design and technological support of machine-building industries”**
New opportunities for more effective organization of learning	82.5	67.3	73.7	72.4
Increased interest in the studied subjects	65	47.6	51	48.7
Using modern learning resources	44.2	52.8	66	48.3
Individual mode and pace of learning the material	89	91.2	87.6	78.7
Readiness to e-learning	87.8	66.4	82.5	71.2

Lack of skills in the electronic educational environment	12.2	33.6	17.5	28.8
Inefficiency of using e-learning elements	16.3	21.4	14.3	17.2

The pedagogical potential of the electronic environment ensures the improvement of social and humanitarian training of engineering and technical personnel at the university through the use of subject, integrative, and managerial components.

- The subject component provides students with the right to independently choose the learning trajectory, takes into account their psycho-physiological features and individual characteristics, creates stimulating situations, increases the interest in the subject, and provides an atmosphere of cooperation and dialogue interaction.
- The integrative component provides interdisciplinary links of social and humanitarian disciplines on the basis of commonality of the studied concepts and topics.
- The managerial component contributes to the implementation of operational "feedback" and provides continuous pedagogical support of the classroom and extracurricular work of students as part of their learning and research activities.

Improving the humanitarian education of engineering and technical personnel is ensured by implementing in the university's electronic environment the author's methodology presented by such types of work as "webquests", "face-to-face", "flex", "rotation", "network project", "virtual museum" and others.

E-learning resources that are of the greatest interest among students

The frequency of students' use of electronic educational resources while studying social and humanitarian disciplines

4. Discussion

Most students are very positive about their activities in the electronic learning environment. This, in particular, is evidenced by the results of a sociological study conducted by the authors in October-November 2018 based on the survey method. The sample consisted of 143 boys and girls, students of first-fourth years in all areas of training and specialties. 73.8% of respondents believe that tasks "revive" their activities, introduce diversity, and even partially "entertain". At the same time, if teachers "adopt" the opinion of students, then the gaming component of electronic courses should be increased. It is not justified methodically and methodologically.

The results of the study make it possible to conclude the following dependencies:

1. The electronic resources are used more actively by extramural students (mural students – 87.7%, extramural students – 98.9%);

2. The activity of use of information resources by students depends rather on the course than on the specialty (84% during the first year of training, 92.7%-99.3% during the next years);

3. The most demanded electronic resources are the textbooks, including the texts of lectures and the study guidelines for the subjects of humanitarian cycle and the tests.

The organization of students' educational and research activities in the electronic learning environment in many ways helps to make social and humanitarian education in a technical university more flexible, productive, and student-oriented. Creating and using the institute's e-learning environment significantly improves the quality of the educational process, combining the best elements of the traditional and innovative forms.

The flexibility of the paradigm makes it possible to choose the structure, the pace of studying the material, and to constantly update the information. Working in the electronic space allows teachers (with the active participation of students) to replenish the course with

new and varied tasks, which increases students' motivation to study social and humanitarian disciplines. The tasks in the Moodle system allow taking into account the individual features of students regarding the speed of learning, repetition of material, or performing review works and tests.

In the conditions of an insufficient number of classroom hours devoted to the study of social and humanitarian disciplines in a technical college, the use of its own electronic environment allows some of the topics to be transferred from the audience to the online mode; various tasks help make independent work of students more interesting, exciting, and effective.

Using the fixation system in the electronic environment, a teacher can control students' independent work time and their progress.

During the process of performing tasks, students develop skills for self-education, planning and organizing their learning and research activities; mastering new electronic platforms allows teachers to provide step-by-step help to students in their scientific work, thereby improving the quality of communication between students and teachers. In this process, a teacher constantly coordinates students' activities; in turn, students receive qualified comments on the improvement of their educational activities and, as a result, their level of knowledge and skills on the subject increases.

The study is limited to the bachelor's degree and specialist's degree programs of a technical university. In future research, there is a plan to integrate information systems success theory with e-learning satisfaction theory, as it was done by Cidral et al. (2018).

5. Conclusions

The practical relevance of the study is as follows: sets of didactic tools are developed including electronic notes and presentations of lectures, test tasks of workshops, interactive games, as well as an electronic package of applied programs.

Providing education using traditional forms and own e-learning environment are two elements of a unified system, the interaction of which makes the educational process as efficient as possible. The organization of the educational process on the basis of electronic space is effective because it opens unlimited access to any educational resources, there are various forms of tasks that are not available in the classroom, and there is the possibility of continuous monitoring and correction of students' performance.

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Annexes

Annex 1. QUESTIONNAIRE

for a survey of the students of the Ryazan Polytechnic Institute

on the topic “The use of elements of the electronic educational environment in social and humanitarian disciplines”

To obtain objective data, you are requested to give sincere answers that correspond to reality.

1.Gender

2. Age

3. Main status (university student/organization employee). Underline whatever applicable.

4. Resident of a city/a village. Underline whatever applicable.

5. The course of study at the Institute now

6. Mode of study.

7. For what purpose (goals) have you entered our Institute?

a) to get a profession that is modern and in demand on the labor market;

b) to get a more prestigious status in the society and a well-paid position;

c) to improve the level of knowledge and understanding of the world;

d) other.

8. Are you interested in general in the study of social and humanitarian disciplines — philosophy, sociology, law, a foreign language, and the history of Russia?

a) always;

b) sometimes;

c) never.

9. Do you have the skills to work in an electronic educational environment?

a) yes;

b) sometimes I need help from others;

c) no.

10. What do you use to work in the electronic educational environment on social and humanitarian disciplines:

a) a stationary computer;

b) a mobile device with applications;

c) the first and the second, according to the circumstances.

11. How often do you “visit” the portal of distance support of the educational process of social and humanitarian disciplines?

a) every day;

b) several times a week;

c) once a week;

d) 2-3 times a month;

e) only to complete the assignment of the teacher.

12. Which of the elements of electronic courses in these subjects are the most interesting and exciting for you to apply?

a) lecture notes and presentations;

b) exercises in the form of questions and creative tasks;

c) video and audio materials;

d) tests;

e) multimedia textbooks;

f) group and network projects.

13. Kindly place the characteristics of e-learning environment in order of importance:

a) good layout;

b) convenience;

c) more effective forms of learning;

d) the availability of tips and help in the mode of an online chat;

e) individual mode of work with educational material.

14. Which electronic resources (texts, diagrams, test tasks, etc.) are the most difficult for you to work with and why?

15. Kindly list the advantages of using elements of the electronic educational environment in the educational process.

16. Kindly list the disadvantages of using elements of the electronic educational environment in the educational process.

17. If you were a teacher, what would you change in the content and structure of electronic courses (games, texts, schemes, exercises)?

18. Which parts of electronic courses are the most practical and convenient to use, and which are not?

19. From your point of view, which of the elements of electronic courses need to be changed, processed, or improved?

20. Is the use of resources of the electronic educational environment efficient in the educational process in the modern world?

a) yes;

b) never thought of it;

c) no.

Thank you for participating in the study!

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