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ЦИФРОВАЯ ОБРАЗОВАТЕЛЬНАЯ СРЕДА

Research article / Научная статья

Peculiarities of application of the resources of the Moscow Electronic School platform for the formation of language competence of the students of non-linguistic specialties

Tatyana V. Masharova[1][ID]**, Ekaterina K. Starkova[2]**[ID]✉**,**
Ivan V. Shunin[1][ID]**, Anna S. Pastukhova[3]**[ID]

[1]*Moscow City University, Moscow, Russian Federation*
[2]*Pavel A. Ovchinnikov Polytechnic College, Moscow, Russian Federation*
[3]*Russian Academy of Education, Moscow, Russian Federation*
✉starkova.kate@mail.ru

Abstract. *Problem statement.* The modernization of current foreign language training of students necessitates the active usage of digital technologies that simultaneously ensure the development of lexical, grammatical and phonetic skills. However, many informatization tools (for example, Lingvist, Memrise, Quizlet, etc.) are used by teachers only for the development of individual components of students' language competence (structural or subject-procedural). The article presents a study aimed at identifying the features of using the Moscow Electronic School information educational platform (hereinafter referred to as MES) in order to effectively form the language competence of students of non-linguistic specialties. *Methodology.* The MES platform is considered as an informational and educational resource that supports the solution of the tasks of individualizing foreign language education and increasing the availability of high-quality education. The central component is an electronic library (a database of multimedia materials). The study involved 174 students (in four training areas) of P.A. Ovchinnikov Polytechnic College. The materials of the author's testing were used to assess the level of formation of language competence. The χ^2 (chi-square) Pearson's criterion was applied for statistical processing. *Results*. The MES platform has developed multimedia thematic modules (texts, video and audio clips, illustrations and animations); interactive tasks and exercises for developing language skills; communicative simulators and role-playing games for applying learned language tools in simulated situations of intercultural and professional communication; linguistic and cultural quests and projects that stimulate students to search and creatively

process information; interactive dictionaries, glossaries, thesauri. The didactic potential of the MES platform for the formation of linguistic competence of students of non-linguistic specialties has been clarified: the availability of tools to support the development of all components of foreign language communicative competence in the classroom, online, and in individual training; adaptation of developed multimedia materials to different levels and courses of study; integration of previously developed digital resources. *Conclusion*. The peculiarities of the formation of linguistic competence of students of non-linguistic specialties by means of MES include the following: the development of competence proceeds through the search and resolution of problematic situations supported by texts on special topics and posted on the platform; foreign language activities are aimed at solving tasks designed to assimilate the content of linguistic competence at algorithmic and heuristic levels; for the management of educational and speech skills of self-monitoring and self-assessment activities sets of tasks and tests that require systematic work with the resources of the database of materials are used.

Особенности применения ресурсов платформы «Московская электронная школа» для формирования языковой компетенции студентов неязыковых специальностей

Т.В. Машарова[1], **Е.К. Старкова**[2]✉, **И.В. Шунин**[1], **А.С. Пастухова**[3]

[1]*Московский городской педагогический университет, Москва, Российская Федерация*
[2]*Политехнический колледж им. П.А. Овчинникова, Москва, Российская Федерация*
[3]*Российская академия образования, Москва, Российская Федерация*
✉starkovaek@mgpu.ru

Аннотация. *Постановка проблемы*. Модернизация современной иноязычной подготовки обучающихся обуславливает необходимость активного использования цифровых технологий, обеспечивающих одновременно отработку лексических, грамматических и фонетических навыков. Однако, многие средства информатизации (например, Lingvist, Memrise, Quizlet и т. д.) применяются педагогами только для развития отдельных компо-

нент языковой компетенции студентов (структурной или предметно-процессуальной). В статье представлено исследование, направленное на выявление особенностей использования информационной образовательной платформы «Московская электронная школа» (далее – МЭШ) в целях эффективного формирования языковой компетенции студентов неязыковых специальностей. *Методология.* Платформа МЭШ рассматривается как информационный образовательный ресурс, поддерживающий решение задач индивидуализации иноязычного обучения и повышения доступности качественного образования. Центральный компонент – электронная библиотека (база мультимедийных материалов). В исследовании задействовано 174 студента (по четырем направлениям подготовки) Политехнического колледжа имени П.А. Овчинникова. При оценке уровня сформированности языковой компетенции использованы материалы авторского тестирования. Для статистической обработки применен критерий χ^2 (хи-квадрат) Пирсона. *Результаты.* Средствами платформы МЭШ разработаны мультимедийные тематические модули (тексты, видео- и аудиофрагменты, иллюстрации и анимации); интерактивные задания и упражнения на отработку языковых навыков; коммуникативные симуляторы и ролевые игры для применения изученных языковых средств в моделируемых ситуациях межкультурного и профессионального общения; лингвострановедческие квесты и проекты, стимулирующие учащихся к поиску и творческой переработке информации; интерактивные словари, глоссарии, тезаурусы. Уточнен дидактический потенциал платформы МЭШ для формирования языковой компетенции студентов неязыковых специальностей: наличие инструментов для поддержки развития всех составляющих иноязычной коммуникативной компетенции и в аудитории, и в онлайн-режиме, и при индивидуальном обучении; адаптация разработанных мультимедийных материалов под разный уровень и курс обучения; интеграция ранее разработанных цифровых ресурсов. *Заключение.* Формирование языковой компетенции студентов неязыковых специальностей средствами МЭШ имеет следующие особенности: освоение компетенции протекает через поиск и разрешение проблемных ситуаций, поддержанных текстами специальной тематики и размещенных на платформе; иноязычная деятельность направлена на решение задач по усвоению содержания языковой компетенции на алгоритмическом и эвристическом уровнях; для управления учебно-речевыми действиями самоконтроля и самооценки используются комплексы заданий и тестов, требующих системной работы с ресурсами базы материалов.

Ключевые слова: иноязычная коммуникативная компетенция, обучение студентов технических специальностей, интерактивное приложение, учебно-речевое действие, профессиональное общение, цифровая технология, платформа МЭШ

Problem statement. UNESCO's materials, which provide an analytical sample on the usage of informatization tools in order to stimulate structural changes in modern digital society, define the following. The active penetration of computer

technology and telecommunications supports and intensifies foreign language communication activities, including professionally oriented ones[1]. The corresponding trend, as noted by M. Tamur, V.M. Kurnila, E. Jehadus, S. Ndiung, J. Pereira, and S. Syaharuddin, determines the necessity to orient the education vector so that students acquire knowledge and competencies that will help them become successful and sought-after in the multilingual space [1]. Moreover, A. Kakembo substantiates the strategic importance of the participation of scientific communities, teaching teams, and their collaborations in the practice of developing and incorporating special digital tools to preserve linguistic diversity [2].

According to the conclusions of D. Gillespie, S. Gural, M. Korneeva, in the course of professionally oriented training of students of non-linguistic specialties, the teacher should rely on a communicative approach [3]. Its essence, according to S.V. Sleptsova and I.B. Akinshina, supports bringing speech activity in a foreign language as close to natural communication in informational educational interaction as possible [4].

J. Immanuel and A. Mohamed substantiate that teaching a foreign language on the basis of online services defines a new quality of educational services, which is advisable for mentors to fill with specific methodical materials [5].

L. Yan, K. Joseph, F. Hamzah, and H. Ismail note that in order to increase the effectiveness of foreign language teaching methods and improve students' digital skills, teachers need to monitor the following points by themselves: 1) trends in the field of educational technologies; 2) technical innovations on a variety of resources, educational websites [6].

N.G. Kizrina and O.R. Eliseeva make a reasonable assumption about the need to encourage mentors to be creative when developing educational electronic resources [7]. These conclusions correlate with the conclusions of S. Bećirović, A. Brdarević-Čeljo, and H. Delić by stating that the inclusion of digital online services in foreign language teaching optimizes the process of mastering foreign language speech activity and forms students' sought-after competencies [8].

E.V. Soboleva, N.N. Vekua, S.Yu. Novoselova, and G. Yang propose to develop comprehensive informatization tools that support all components of foreign-language communicative professionally oriented activities [9]. The authors describe the logic of interactive, gamified tasks designed in the format of a web quest, i. e. solving puzzles on certain educational topics.

J. Dong and S. Liu consider the issues of determining the content and structure of professional foreign language competence of college students [10]. The authors show that teachers can use modeling tools in practice to create high-quality educational resources to support foreign language teaching methods.

D. Mymrina, M. Abdrashitova, and E. Zakharova raise the question of relevance of solving the issue of ways to form foreign-language communicative competence in a technical university, which is reasonably considered by the authors to be one of the most important skills of a modern sought-after specialist [11].

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[1] UNESCO. *Digital learning and transformation of education.* https://www.unesco.org/en/digital-education (accessed: 10.12.2024)

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N. Almazova, N. Popova, and T. Evtushenko describe the organizational and methodical aspects of the development of professionally oriented didactic resources in English. By the latter the authors mean textbooks or teaching aids for students of technical specialties, aimed at improving their professional competencies [12].

V.V. Grinshkun notes that among all the complex informatization tools with powerful didactic potential for online learning at all levels of education, the Moscow Electronic School information portal (hereinafter referred to as MES) holds a solid position in terms of a set of tools and methodological solutions [13].

A.D. Zykova points out the necessity to design special methodical materials for teaching a foreign language. This includes the importance of game forms for the development of language skills and the formation of socio-cultural competence; a high proportion of visibility and interactivity; multiple references to materials from different topics (sections) of the course [14].

A.S. Anisimova emphasizes that a foreign language teacher needs to be trained in designing an appropriate effective digital educational environment that takes the features of the MES platform in linguodidactics into account [15].

L.A. Bukalerova and M.A. Simonova emphasize the need to improve educational technologies in connection with the digital transformation of social relations [16].

Thus, the experience of foreign and domestic practice shows that attempts to transform the possibilities of MES into teaching a foreign language to students have been made, but there are still not enough examples of the implementation of comprehensive support for students of technical specialties.

The analysis of the above-mentioned scientific works makes it possible to identify a problem related to the need for additional study of the issues of formation of linguistic competence of students of non-linguistic specialties by means of the MES information educational platform.

The article presents a study aimed at identifying the features of the usage of the information educational environment of the MES in order to effectively form the linguistic competence of students of non-linguistic specialties.

Methodology. A comparative analysis of the means of creating a subject-based digital educational environment (Lingvist, Memrise, Busuu, online generators, mobile applications (Quizlet, Anki), MASH platforms) was performed, which made it possible to identify and substantiate the possibilities of using MES to form the linguistic competence of students of non-linguistic specialties.

The MES Library, i. e. a structured catalog of electronic educational materials (hereinafter referred to as EEM), was designed and filled by Moscow teachers. All EEMs are undergoing a moderation stage. Available resources are lesson scenarios, tests and simulators, videos, virtual labs, 3D models, augmented reality applications, etc.

The experimental search work was carried out on the basis of the P.A. Ovchinnikov Polytechnic College. Training programs for students involved in the experiment are the following:

— 09.02.07 "Information systems and programming" (42 people);
— 11.01.01 "Installer of radio electronic equipment and devices" (42 people);

− 15.01.32 "Operator of software-controlled machines" (44 people);

− 46.02.01 "Documentation management and archival science" (46 people).

There are 174 people in total. Two groups (experimental and control) of 87 respondents each were formed.

The usage of materials supported by the work in the MES Library should be optimally carried out within the framework of studying the topics "Problems of modern civilization", "Industrial technologies", and "Technological progress: prospects and consequences. Modern means of communication". The main reason for the choice is the opportunity to use students' existing knowledge of vocabulary, grammar, and experience with didactic information resources for foreign language communication on professional topics. In addition, by this time, the work of the college staff with the resources of the MES had already been carried out. Author's interactive materials for the MES began to be developed.

Topic no. 2.3 "Problems of modern civilization" (4 hours). The Vocabulary Section studies natural phenomena, physical phenomena, and ecology. In the Grammar Section, grammatical structures typical of popular science texts are studied. Within the framework of practical exercises (4 hours), the topics "Natural and physical phenomena", "Environmental problems", and "Economic and social problems" are worked out.

Topic no. 2.4 "Industrial technologies" (6 hours). The Vocabulary Section studies machines and mechanisms; industrial equipment. In the Grammar Section, grammatical structures typical of popular science texts are studied. As a part of practical training (6 hours), the topics "Machines and mechanisms", "Industrial equipment", "Work in production", and "World Skills professional skills competition" are worked out.

Topic no. 2.5 "Technological progress: prospects and consequences. Modern means of communication" (12 hours). The Vocabulary Section studies types of sciences, names of technical and computer tools. In the Grammar Section, the passive voice and grammatical sentence structures typical of the popular science style are studied. As a part of practical training (6 hours), the topics "Scientific achievements", "Modern information technologies", and "ICT in professional activity" are worked out.

In total, 38 hours were allocated directly for the participants of the didactic process to work with the MES Library as a means of comprehensive support for the discipline "Foreign Language", which takes into account the specifics of the educational organization and the direction of students' training.

To assess the formation of language competence, the test materials presented in the research results were used. The Pearson's criterion χ^2 was used in statistical data processing[2].

Results and discussion. The analysis carried out earlier made it possible to identify the following:

− didactic potential of digital resources for the formation of students' foreign language competence;

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[2] Online calculator: https://medstatistic.ru/calculators/calchit.html

— special needs of students of non-linguistic specialties, taking into account the specifics of their future specialty;
— possibilities of the MES for the foreign language training of both the students themselves and for the activation of the teacher's work.

Thus, a teacher (when working with technical specialists), oriented to the effective use of digital services, including the tools of the MES environment, should: 1) show students the language functions as a sufficiently flexible system supporting communicative tasks; 2) support students' motivation and positive attitude to study for maximum successful assimilation of information, covering the program of specialization in a foreign language in its entirety, without losing sight of narrowly specialized goals (the need to compose algorithms and develop programs in a virtual environment).

The MES portal can, with appropriate content, become an effective means of information and communication technologies, providing the most favorable conditions for the implementation of the digital educational environment by the following means:
— inclusion of language material in a situation of professionally oriented communication;
— organization of students' learning activities, taking into account the stages of formation of reading, speaking, and listening skills;
— increase of students' motivation, engagement, and autonomy, and develop their communication and meta-subject skills.

All this combined prompted us to use the MES Library to implement the training package we developed aimed at developing language competence among students of the P.A. Ovchinnikov Polytechnic College. Moreover, according to its creators, the program is initially adapted to the role of an instructor, a facilitator and is an effective teacher's assistant.

The quantity and quality of the developed exercises in the MES Library, thanks to multimedia capabilities (sound, graphics), will allow to achieve a higher level in the formation of language competence with minimal time and effort. If students complete all the prescribed exercises in electronic content, then the time for communicative tasks in productive speech activities increases. It is important to note that a situation of success is created, since the learned language units and rules provide a deeper, more accurate and faster understanding of subsequent texts.

In the proposed model, we will develop the following components based on the EEM content of the MES Library:
1. multimedia thematic modules (texts, video and audio clips, illustrations and animations);
2. interactive tasks and exercises for developing language skills;
3. communicative simulators and role-playing games for the application of learned language tools in simulated situations of intercultural and professional communication;
4. linguistic and foreign studies quests and projects that stimulate students to search for and creatively process information;
5. interactive dictionaries, glossaries, thesauri.

Note that adding texts, video and audio clips, illustrations and animations is possible directly through the "Add material" button from the main menu of the MES Library.

Let's perform a step-by-step description of the work on designing interactive applications. As a basis, we take the material studied under Topic no. 2.5 "Technological progress: prospects and consequences. Modern means of communication" (12 hours). Its detailed content was presented earlier. The actual material (questions, assignments) is selected by the teacher from the manual by D.A. Kozhanov "Professional English in the field of information technology" (Part 3: "The Internet and online services: your computer is not alone")[3].

Step 1. Creating a blank in LearningApps.org (for example, a crossword puzzle, a matchmaking game, etc.). Then we download it as an archive and save it to our computer.

Step 2. We enter the MES Library under our teacher profile. And we get to the main window, where we can view the contents of all the materials available to a particular user. Then we can upload a new application / material.

Step 3. Selecting content to add to the library (in our case, the "Application").

Step 4. The design of the cover for working with the application. Here we enter the name of the application, and add an image. For the convenience of the user, all required fields are marked with "*".

Step 5. Uploading the finished application from the disk.

Step 6. Editing the application. If necessary, we can change both the content and design, for example, to change the course or the name.

Similarly (according to the described algorithm), several more interactive applications were created in the library structure on the topic "The Internet and online services: your computer is not alone". The applications being developed are aimed at improving the following skill groups:

— lexical (selection of synonyms, antonyms, definitions, filling in gaps);
— grammatical (choosing the correct verb form, constructing sentences);
— phonetic (recognition and reproduction of sounds, accentuation, intonation).

In general, a comprehensive educational application consists of didactic games, laboratories, workshops, demonstrations, interactive tasks and other holistic materials. The process of using them in foreign language communication activities includes the formation of achievements, ratings, and levels. All of them are implemented as web applications.

The creation of scenarios for a lesson can be described in the same way. In these scenarios, it is convenient and effective to use video / audio materials, test tasks, and task slides. The figure illustrates what the folder structure looks like, in particular "My Materials", filled with scripts and interactive applications for a specific course topic.

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[3] Kozhanov DA. *Professional English in the sphere of information technologies: educational and methodical manual.* Barnaul: Altai State Pedagogical University; 2017. (In Russ.)

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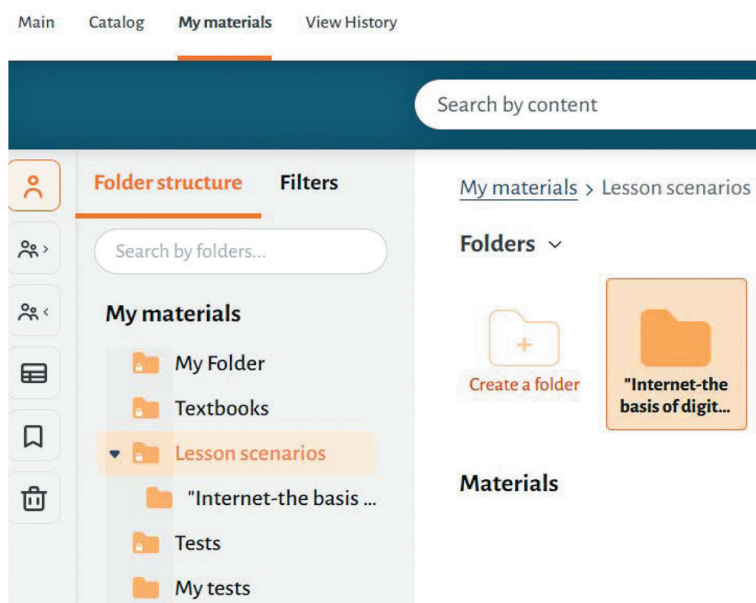
The contents of "My Materials" folder in the teacher's personal account

Source: prepared by Tatyana V. Masharova, Ekaterina K. Starkova, Ivan V. Shunin, Anna S. Pastukhova.

At the first stage of the experimental work, college students were divided into two groups using testing materials: control and experimental. There were 87 respondents in each group.

An example of the first type of question (maximum 2 points): *You are presented with a fragment of a text in English. Choose the principles of modern information technology or specify definitions for the term "Information Technology"*. There are 10 such questions in the test.

An example of the second type of question (maximum 3 points): *In two or three sentences in English, compare the capabilities of a quick search and a legal navigator in the legal reference system. Alternatively, list the rules for creating strong (tamper-resistant) passwords*. There are 5 such questions in the test.

An example of a third type of question (maximum 4 points): *Listen to an audio clip about an overview of online tools used in organizing teamwork. List these tools and evaluate their applicability in your professional activity*. There are 2 such questions in the test.

There are 17 questions in total, and the maximum score is 33 points. If the student scored less than 14 points, the level is "basic", from 15 to 28 points, is "advanced", and more points, is "creative". The interpretation of the results was carried out as follows.

At the "basic" level, college students are quite successful in using informatization tools in everyday life, but they make significant mistakes when using them in foreign language professional communication. They are not fully aware of the importance of their profession and the need for language training. Students do not have the necessary professional and foreign language knowledge and skills for intercultural communication in the field of information systems and programming.

Students with an "advanced" level of competence apply modern means of informatization in foreign language professional communication with minor errors. They are distinguished by their shallow knowledge of the specialist's work functions (of the chosen training program), and by a small amount of communicative, linguistic, and cultural knowledge. College students are motivated to learn a foreign language, taking into account their future profession and the possibility of self-realization in a multilingual and multicultural world. Students have the skills to work independently. However, they are not capable of professional verbal communication in a foreign language, during which the problem is formed and its solutions are found based on the personal experience of the participants.

Students with a "creative" level of foreign language competence use informatization tools on a high level. They are fully aware of the place and role of a specialist in their chosen profession in society. Such specialists are able to analyze, design and carry out interpersonal, group foreign language communications in accordance with national cultural standards in a multilingual and multicultural world. Various forms of training and self-control are used. They have a pronounced ability and willingness for personal and professional self-improvement.

Further, the students of the experimental group actively used the resources of the MES environment prepared by the teacher and taking into account the specifics of college training. In the control group, students studied a foreign language according to the work program of the P.A. Ovchinnikov Polytechnic College, but without purposefully working with MES services.

For example, it was necessary to develop and create a multilingual interactive video "Student's Day with Moscow Colleges" using modern digital technologies. The characters of the video should say the following phrases: "being a student at a Moscow college is promising and interesting", "every employer is faced with issues of automation and information management of labor organization, labor relations and regulations of these processes", "allows them to develop the necessary skills to build a successful career", "an important factor in improving the professional competence of employees responsible for automating the system's activities is deep knowledge", "February 25 at 11 a. m.", "main hall of the building", "knowledge of a foreign language is encouraged".

At the fixing stage of the study, testing was also conducted based on the course materials. The results of the assessment before and after the experimental work are presented in the table.

The effectiveness of usage of the MES educational environment in the foreign language training of college students

Training levels	Groups			
	Experimental (87 students)		Control (87 students)	
	Before the experiment	After the experiment	Before the experiment	After the experiment
Basic	43	14	43	33
Advanced	34	54	33	39
Creative	10	19	11	15

Source: compiled by Tatyana V. Masharova, Ekaterina K. Starkova, Ivan V. Shunin, Anna S. Pastukhova.

For $\alpha = 0.05$, χ^2_{crit} is 5.991. It is known that x2observ.1 < x2crit (0.063 < 5.991), and x2observ.2 > x2crit (10.571 > 5.991). Therefore, the changes in the quality of foreign language training in the experimental group can be considered non-accidental.

On foreign language training for students of the P.A. Ovchinnikov Polytechnic College, let's note the following.

The number of specialists whose level of foreign language training is defined as "creative" in the experimental group increased by 10.3 % (from 11.5 % to 21.8 %). The dynamics in the control group at this level is 4.6 %.

The number of students whose level of foreign language education is defined as "advanced" in the control group increased by 6.9 % (from 37.9 % to 44.8 %). In the experimental group, the dynamics is more significant: 23 %. This indicates that the level of foreign language training of the majority of students has increased.

The number of students whose level of foreign language training is defined as "basic" in each group has also changed qualitatively. But in the control group, there were 11.5 % fewer participants with the "basic" level. In the experimental group, it increased by 33.3 %.

Conclusion. So, a digital platform for multilingual interaction should provide its participants with a set of educational resources (computers, other ICT equipment, communication channels, a system of modern pedagogical technologies) that support and guide foreign language learning in a modern information and educational environment.

As a result of the research, the following potential of MES resources has been identified for the formation of linguistic competence of students of non-linguistic specialties.

Interactive simulators can be used to support foreign language communicative competence (in the totality of its components: speech, language, socio-cultural, compensatory, and educational-cognitive) in the classroom, online, and in individual training.

The templates for configuring simulators are simple and intuitive. Only text input is required, visualization is generated by the service.

You can organize feedback with users: enter a code word for verification, an example, a task; insert a link to multimedia content or a document.

Any teacher can use the electronic construction kit – it does not require any special training. It will be enough to have basic skills in using a personal computer.

The peculiarities of the formation of professionally-oriented foreign language communicative competence by means of MES include the facts that:

1. the acquisition of language competence by students proceeds through the search and resolution of problematic subject situations focused on professional activity and supported by texts on special topics;
2. foreign language activities are aimed at solving tasks designed to assimilate the content of language competence at algorithmic, student and heuristic levels, respectively;
3. the main factor in the development of the English language teaching system is the usage of information and educational technologies.

The following difficulties of using digital educational technologies were identified using the example of MES for high-quality language training: insufficient level of digital competence of participants in foreign language interaction; workload of teachers and low motivation to transfer their courses to the platform; lack of comprehensive materials in the MES Library that have passed the moderation stage; lack of active (online / offline) contacts with native speakers, and others.

The developed materials on the MES platform allow to deepen, summarize and control the acquired knowledge on the studied linguistic and foreign studies topics and, finally, simply expand the professional and educational horizons of students. The direction for improvement is the refinement of materials on all topics of the discipline and for other training programs.

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Bio notes:

Tatyana V. Masharova, Doctor of Pedagogical Sciences, Professor, Professor at the Department of Pedagogy, Institute of Pedagogy and Psychology of Education, Moscow City University, 4 2nd Selskokhozyaystvenny Proezd, Moscow, 129226, Russian Federation. ORCID: 0000-0001-5974-7748. SPIN-code: 4792-4091. E-mail: mtv203@mail.ru

Ekaterina K. Starkova, Teacher, Pavel A. Ovchinnikov Polytechnic College, 6/1 Bibirevskaya St, Moscow, 127549, Russian Federation. ORCID: 0000-0001-8613-9430. SPIN-code: 2788-3093. E-mail: starkova.kate@mail.ru

Ivan V. Shunin, postgraduate student, Department of Informatization of Education, Institute of Digital Education, Moscow City University, 29 Sheremetyevskaya St, Moscow, 127521, Russian Federation. ORCID: 0009-0000-9644-3436. SPIN-code: 5047-5862. E-mail: shuniniv@mgpu.ru

Anna S. Pastukhova, Leading Analyst, Laboratory for Development of Digital Educational Environment, Centre for Education Development, Russian Academy of Education, 8 Pogodinskaya St, Moscow, 119121, Russian Federation. ORCID: 0009-0008-1498-8546. SPIN-code: 9678-6598. E-mail: pastukhova.as@raop.ru

Сведения об авторах:

Машарова Татьяна Викторовна, доктор педагогических наук, профессор, профессор департамента педагогики, Институт педагогики и психологии образования, Московский городской педагогический университет, Российская Федерация, 129226, Москва, 2-й Сельскохозяйственный проезд, д. 4. ORCID: 0000-0001-5974-7748. SPIN-код: 4792-4091. E-mail: mtv203@mail.ru

Старкова Екатерина Константиновна, преподаватель, Политехнический колледж им. П.А. Овчинникова, Российская Федерация, 127549, Москва, ул. Бибиревская, д. 6, корп. 1. ORCID: 0000-0001-8613-9430. SPIN-код: 2788-3093. E-mail: starkova.kate@mail.ru

Шунин Иван Васильевич, аспирант, Департамент информатизации образования, Институт цифрового образования, Московский городской педагогический университет, Российская Федерация, 127521, Москва, ул. Шереметьевская, д. 29. ORCID: 0009-0000-9644-3436. SPIN-код: 5047-5862. E-mail: shuniniv@mgpu.ru

Пастухова Анна Сергеевна, ведущий аналитик, лаборатория развития цифровой образовательной среды, Центр развития образования, Российской академии образования, Российская Федерация, 119121, Москва, ул. Погодинская, д. 8. ORCID: 0009-0008-1498-8546. SPIN-код: 9678-6598. E-mail: pastukhova.as@raop.ru