

## Modern techniques of organizing computer support for future teachers' independent work in German language

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**Abstract.** The purpose of the study is to elucidate the theoretical and methodological aspects of computer support organization for independent work in a foreign (German) language for future teachers of different subjects.

The subject of the study is a methodological technique of organizing effective computer support for future teachers to work independently in a foreign (German) language.

Objectives of the study: to state the goals of studying foreign languages in its broad and narrow sense, the requirements for the results of future teachers' training in different subjects; to explore ways of organizing computer support for future teachers' independent work; to determine the list and purpose of the basic and auxiliary structural elements of a typical e-learning Moodle course in a foreign language; to provide methodological recommendations for the organization of future teachers' independent work in the content of a separate training module of the Moodle course "Foreign (German) Language".

The article summarizes the experience of organizing computer support for future teachers' independent work and the substantive and methodological features of its implementation into the process of experimental introduction of the Moodle course "Foreign (German) Language" into the educational process carried out on the basis of Kryvyi Rih State Pedagogical University.

**Keywords:** computerization of independent work, future teachers, methodology of teaching a foreign language, Moodle.

### 1 Introduction

The purpose of studying a foreign language in its broad sense (by future experts in any field) is mastering the language means for the implementation of the basic functions of the language, namely:

1. instrumental (language used to obtain things);
2. regulatory (to regulate the behavior of others);

3. interactive (to interact with other people);
4. personal (to express personal feelings and meanings);
5. heuristic (for learning and discovery);
6. imaginative (to create a world of imagination);
7. representative (for transmitting information) [14].

According to the educational programs for the preparation of future teachers of various subjects at Kryvyi Rih State Pedagogical University (KSPU), the purpose of studying the discipline “Foreign language” (as a normative one from the cycle of general preparation) is to acquire such competencies as:

- fluent reading and understanding of authentic (“true”, official) texts of both general and professional orientation;
- recognition of basic grammatical constructions and their use in oral and written speech;
- defining of the topic covered in the text, the selection of the main opinion, the choice of basic facts; drawing up a plan;
- answers to questions about the main content, the ability to find and analyze the required content;
- communication on general and professional topics [29].

The main task of studying a foreign language for future teachers is the development of vocational competence in the field of professional communication, which includes the accumulation of geographical, historical, economic, cultural and political knowledge; expanding the universal cultural outlook, bringing them into the values and socio-cultural features inherent in different levels of civilization; forming one's own views, ability to hold discussions, ground one's own opinion, etc.

Considering the results of Valerii Yu. Bykov [5], Andrii M. Hurzhii [13], Tamara I. Koval [20], Mikhail P. Lapchik [23], Alla F. Manako [24], Nataliia V. Morze [28], Maiia V. Popel [25], Serhiy O. Semerikov [36], Mariya P. Shyshkina [34], Kateryna I. Slovak [33], Oleh M. Spirin [37], Aleksander V. Spivakovsky [8], Andrii M. Striuk [18], Illia O. Teplytskyi [35], Nataliia P. Volkova [31], Yuliia V. Yechkalo [38], Myroslav I. Zhaldak [46] and other national as well as foreign scientists, there can be argued that the effectiveness of the fundamental training of future teachers in general (and in a foreign language in particular) can be implemented through the organization of a modern educational process using information and communication technologies (ICT). The pedagogically balanced and appropriate involvement of ICT software and Internet services will enable the students (future teachers) to become independent in their work. After all, the potential of independent work (in the classical as well as in the modern sense) allows you to realize the educational, developmental and educational functions of the educational process, promotes the development of students' intellectual and creative abilities, their cognitive activity and creative thinking, language and speech skills as well as to define their humanitarian position [43].

The organization of future teachers' independent work in a foreign language involving innovative ICT software and Internet services is especially relevant for:

- full-time students who receive education according to an individual plan (the proportion of independent work is more than 40% of the total number of academic hours in the discipline);
- students of part-time (distance) form of study (the proportion of independent work – at least 80%);
- students with special educational needs, etc.

## **2 Ways of organizing computer support for future teachers' independent work**

Computer support for the educational process, including the independent work of students (future teachers), in any academic discipline, including a foreign (German) language, can be implemented in various ways with the involvement of current technologies of open education (education for everyone and education everywhere).

*The first method* is based on the presentation of an electronic educational and methodical complex in the discipline (or its individual components) in the repository of the educational establishment or on the webpages of educational and methodical materials of the department [7; 15; 16; 17].

Under these conditions, students' independent work usually involves working with electronic versions of officially published printed educational materials (textbooks, tutorials, etc.), which today require re-issue to supplement them with an interactive computer-oriented component.

*The second method* is based on the presentation of the components of the e-learning complex in the discipline, including materials for students' self-study, on the corporate Google teacher's or department disk. (Note: On July 1, 2019, the volume of corporate account disks for non-profit educational institutions is not limited.)

One of the advantages of this method over the above mentioned is that cloud repositories can store resources in different formats (including multimedia), and not just text documents.

Another advantage is that, even when presenting practical tasks in the format of text documents – \*.doc/\*.docx or \*.odt – (prototypes of electronic workbooks), students have the opportunity to download copies of such documents in order to store and open them for editing in a personal learning environment [21; 22] created with Google Drive and Docs services.

In addition, the owner of the e-learning complex in the discipline (teacher) independently determines the degree of openness of its components, because it has the ability to set up shared access to a folder with the complete complex or individual components of the complex for:

- a specific group of users whose e-mail is indicated in the corresponding window;
- users of corporate (educational) domain who will have a link to the resource;
- users of corporate (educational) domain in the absence of the link to the resource, and based on the results of its successful search;
- users of the Internet community by the link provided;

— Internet community users by search results.

*The third way* of organizing computer support for students' independent work is based on the presentation of relevant educational and methodological materials in the form of electronic training courses created and implemented in the educational process using systems or services of learning management, the most common of which (in the system of national education) is *Google Classroom* [2; 15] and *Moodle* [39].

*Google Classroom* is a portal solution that enables you to create an integrated e-environment based on a variety of cloud services and tools; a service that connects Google Docs, Google Drive, and Gmail, helps you create and streamline tasks, rate, comment, and organize effects – outside of real-time communication with students [10; 26].

*Moodle* (an acronym for Modular Object-Oriented Dynamic Learning Environment) is a learning platform designed by Martin Dougiamas, aimed at bringing educators, administrators and pupils (students) together into one reliable, secure and integrated system for creating a personalized learning environment; a free, open, extensible learning management system that implements the philosophy of “pedagogy of social constructivism” (Ernst von Glasersfeld [9], Seymour Papert [30], Jean Piaget [32], Illia O. Teplytskyi [40], Lev S. Vygotskii [44]) and is focused primarily on organizing interaction between the teacher and students, although suitable for the organization of traditional distance courses as well as the support of full-time study; written in PHP using a SQL database (MySQL, PostgreSQL or Microsoft SQL Server) complies with SCORM; has been translated into dozens of languages, including Ukrainian, and is used in over 190 countries [27].

Opportunities for lecturers (teachers) in the Moodle environment: providing tools for developing author distance courses; placement of teaching materials (lecture texts, practical / laboratory and self-study assignments; supplementary materials (books, manuals, manuals, methodological developments) in .doc, .odt, .html, .pdf formats, and video, audio and presentation materials in different formats and through additional plugins; possibility of adding various elements of the course; rapid modification of educational materials; possibility of using different types of tests for creating test tasks; automatic formation of tests; automation of the process of knowledge testing; student completion of coursework and student test reports, adding a variety of plugins to the course (using a variety of third-party distance learning software).

Opportunities for university (secondary school) students in the Moodle environment: availability of learning materials (lecture texts, assignments for practical / laboratory and self-study papers; additional materials (books, guides, manuals, methodology recommendations) and tools for communication and testing 24/7; availability for group work (wiki, forum, chat, seminar, webinar); viewing your own results of the distance course, including the results of all attempts to pass the test; communication with the teacher through personal messages, forum, chat; downloading files from completed tasks, using event reminders up to date, etc. [1]

The Moodle system is not a specialized language learning tool, but its additional modules, including Read Aloud [12; 20], provide the ability to form and develop lexical, grammatical and phonetic competences in the process of different types of

speech activity (reading, listening, writing and dialog speech), to evaluate pupils (students) on the fluency of reading and the correct pronunciation of foreign words in the texts reading process (Words Correct Per Minute) and more.

Taking into account the results of studies carried by Klaus Brandl [3], Michael D. Bush [4], Gary A. Cziko [6], Robert Godwin-Jones [11], Justin Hunt [12], Claudia Warth-Sontheimer [45], the achievements of enthusiastic teachers who have been conducting experimental implementation of e-courses since 2006 the KSPU educational process, and recent trends in the KSPU educational policy [19], for the organization of independent work of students (future teachers) in learning German, the technique of design and implementation of the e-learning Moodle-course “Foreign (German) Language” was chosen. The typical course structure, the specific content and elements of the methods of its implementation are described below.

### **3 Basic and auxiliary structural elements of a typical e-learning Moodle course in a foreign language**

In the structure of a typical e-learning Moodle course in a foreign language, certain basic and auxiliary elements can be distinguished.

The basic structural elements of a typical e-learning Moodle-course in a foreign language are:

- “Folder”, “File”, and “URL (web link)” resources (to submit / refer to the regulatory documentation of the discipline (work program and / or extracts from it, electronic versions of printed didactic resources, descriptive recommendations, etc.); for submitting / accessing thematic texts and authentic texts for additional reading or performing individual research tasks; for accessing Google documents with a systematic list of sources (printed and electronic) recommended for further mastering), audio and / or video, for the treatment helped to inter-installed software and Internet services to support the study of foreign languages to refer to the forms of input (intermediate and / or final) survey, etc.);
- “Glossary” activity (for submission of thematic dictionaries);
- “Tasks” activity (for performing oral or written exercises with recording of their performance in the Moodle journal);
- “Test” activity (to organize and support ongoing and / or final testing with automatic processing of its results and entering estimates for their performance in the Moodle journal).

Additional structural elements of a typical e-learning Moodle course in a foreign language are:

- “Page-type” resource (for submitting a systematic list of sources (print and electronic; open educational resources), audio and/or video materials recommended for additional mastering; in support of foreign language learning);
- “SCORM package” activity (for example, to access interactive exercises created with LearningApps and to record their performance in the Moodle journal);

- “Forum” activity (for written asynchronous communication with the teacher and / or other students of the course, with the possibility of entering the resulting grades in the Moodle journal);
- “Chat” activity (for written synchronous communication with the teacher and/or other course participants with the possibility of entering the resulting grades in the Moodle journal).

Demonstration of examples of the following elements application on the example of the content module “Ukraine. Education and Culture” is presented in the next section.

#### **4 Typical content of the module “Ukraine. Education and Culture” in the e-learning Moodle-course “Foreign (German) Language” and guidelines for organizing students’ independent work**

At this stage of the study, the e-learning Moodle course “Foreign (German) Language” is at the design stage (involving content regulation techniques [22]) simultaneously with the experimental introduction into the KSPU educational process.

Thus, the basis of the module “Ukraine. Education and Culture” of the educational Moodle course “Foreign (German) Language” (Fig. 1) contains the materials of the traditional (academic) textbook in German “Ukraine” [42].

Theoretical materials of the module (thematic educational texts) are presented in the form of elements-resources of the file type (pdf-format, currently without audio-supplement).

Each thematic text has a corresponding glossary page with new vocabulary, which, if necessary, can be supplemented by course’ participants with both text and audio components (Fig. 2).

To effectively master the new vocabulary, LearningApps interactive exercises with audio content were designed and loaded into the course in the form of “SCORM package” activity elements (Fig. 1, 3).

To effectively learn the spelling of the new vocabulary, the design of test tasks (Fig. 4) was performed, which could be used by the trainees in the training mode (without evaluation and unlimited number of attempts).

Other tasks for the written practical performance are presented in the form of a Google text document (Fig. 5).

Students copy the document to their personal learning environment, set up document sharing for the teacher, and after self-completion, wait for the teacher's assessment in the Moodle Register.

During the written practical tasks, students may, if necessary, refer to the pages with additional course resources (content module / topic, Fig. 6), a text chat room or a Question / Answer forum (Fig. 1).

A key type of extra-curricular independent work in Foreign Language is performing Individual Science-and-Research Assignments (ISRA).

The screenshot shows a Moodle course page for 'Курс: Іноземна (німецька) мова'. The browser address bar shows the URL: <https://moodle.kdpu.edu.ua/course/view.php?id=538>. The page features a navigation menu with 'Forum "Fragen / Haftung"', 'Chatten', and 'Wortschatz (Glossar)'. Below this is a section titled 'Selbständiges Arbeiten' with a sub-section 'Forum "Findividuelle Lehr- und Forschungsaufgaben"'. The main content area is titled 'Тема 3' and 'Die Ukraine. Die Bildung und Kultur'. It lists several resources: '3.1. Die Ukraine', 'Zusätzliche Ressourcenseite 3.1', 'Übung LA.3.1 (Teil 1)', 'Übung LA.3.1 (Teil 2)', 'Trainingstests "Die Ukraine"', and 'Übung 3.1 (Die Ukraine)'.

**Fig. 1.** Moodle course page “Foreign (German) Language”

The screenshot shows a Moodle Glossary page titled 'Wortschatz (Glossar)'. It includes a search bar with a 'Знайти' button and a checkbox for 'Пошук за повним текстом'. There is a 'Додати новий запис' button and two tabs: 'Сторінка за алфавітом' and 'Сторінка за категоріями'. The current category is '1. Die Ukraine'. The page displays two entries: 'bedingen' with the Ukrainian translation 'обумовлювати' and 'betragen' with the Ukrainian translation 'сплачувати'. Each entry has a 'Xφ' icon to its right.

**Fig. 2.** Glossary page with vocabulary for the topic "Die Ukraine"

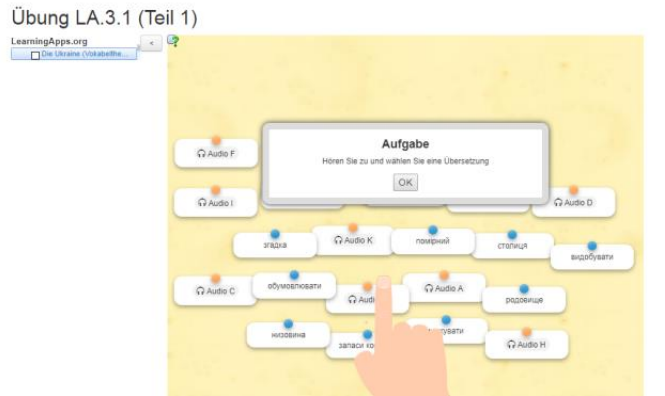


Fig. 3. Interactive LearningApps page

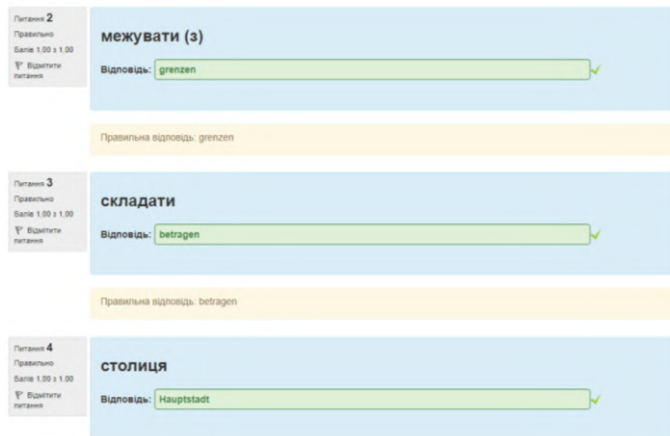


Fig. 4. Training test page

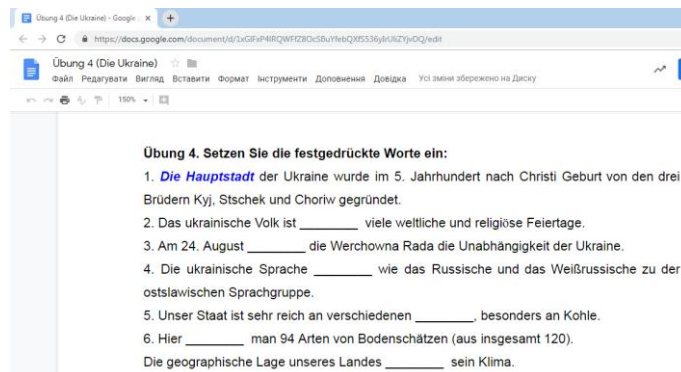
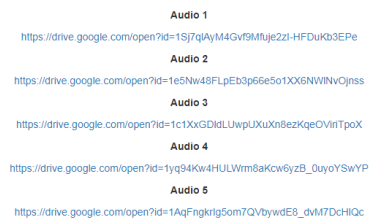


Fig. 5. The page with the task for written practical implementation

## Zusätzliche Ressourcenseite 3.1



**Fig. 6.** Page with links to additional resources

The purpose of ISRA in Foreign Language (in this case German) is to study part of the program material individually, namely: individual work with profession-oriented authentic texts, systematization, deepening, generalization, consolidation and practical application of the acquired subject knowledge and development of components of the key competence – readiness for lifelong learning.

Individual work with professionally directed authentic texts involves the following activities:

- reading of the original text (introductory, in-depth reading, scanning/skimming);
- translation (oral and written, special and artistic, synchronous and sequential, abstract, etc.);
- performing pre-text and post-text lexical-grammatical exercises, exercises for developing the mechanism of probable forecasting and creative imagination;
- referring to special reference literature in foreign language;
- processing of materials of professional load, which is based on the terminology of a certain specialty, etc.

When evaluating individual work with authentic literature, the following should be considered:

- the degree of consistency of statements with a given theme, text;
- completeness of perception and reflection of the theme, situation;
- ability to use and find the necessary information in dictionaries and additional literature in the specialty;
- the level and characteristics of improvisation in the formulation;
- correctness and variety of use of linguistic means;
- ability to analyze individual places in the text, organize and comment on the received information;
- the level of awareness of linguistic features in the artistic translation of authentic text;
- creative and extraordinary approach to working with texts on a specialty, etc.

The LMS Moodle E-Learning Course offers students a link to a folder of authenticated texts (Fig. 1) and a Moodle page containing a list of open educational resources in foreign languages. For current control over their performance, personal (student) topics of the “ISRA” forum were created (Fig. 1).

To perform the final control, a test was designed with test tasks of different kinds (Fig. 7) – closed and open, with and without multimedia content, as well as one task of “Essay” type.

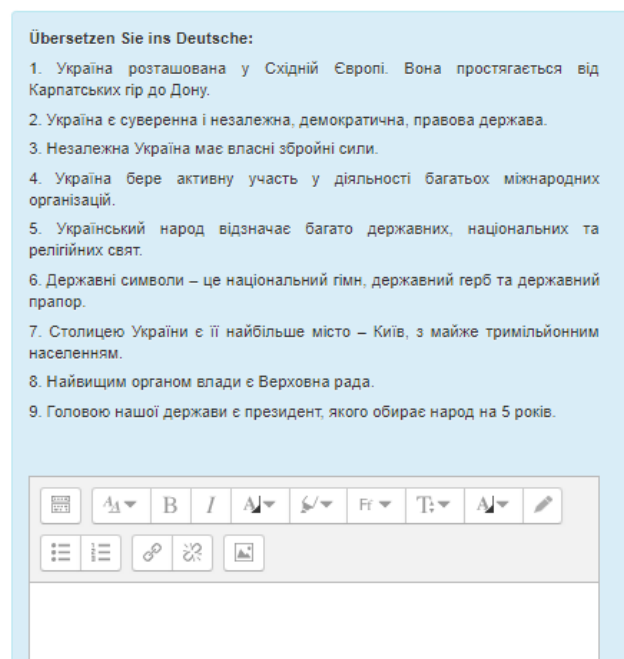


Fig. 7. Page with final test tasks

Students have one attempt to complete the final test tasks, the results of which are automatically recorded in the course’s Moodle-journal.

## 5 Conclusions

1. The pedagogically balanced and appropriate involvement of ICT software and Internet services, including training management systems and services, gives the opportunity to innovatively activate the independent work of future teachers – both full-time and part-time (distance) students.
2. Standard (universal, general) and specialized LMS Moodle tools provide powerful potential for the formation and development of future teachers’ high-level lexical, grammatical and phonetic competences in various forms of educational process organization, including independent work.
3. The defined structure, content and methodology of working with the elements of the Moodle course “Foreign (German) Language” require further introduction into the educational process and implementation of monitoring expertise to obtain scientifically sound and grounded conclusions on their effectiveness.

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