Integrated testing system of information competence components of future translators

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Abstract. The article deals with the diagnosis of the formation of the information competence components of translators through testing. The use of testing to determine the level of formation of the information-thematic component of the information competence of translators is demonstrated. It has been established that one of the ways to form the information-thematic component of information competence in the aspect of studying terminology can be the use of thematic networks. The development of a thematic network is shown on the example of the thematic network "Electrical equipment". The stages of test control, which are consistent with the logic of the organization of the educational process and the process of forming the information competence of the future translator according to the scheme of the developed thematic network, have been determined. These stages are the current, thematic, modular, final testing. The main types of test tasks are defined, the combination of which allows diagnosing the level of formation of the information-thematic component of students' information competence. Criteria and principles for the selection of test tasks for each of the testing stages are proposed. The ratio of test tasks of different types and complexity at the determined testing stages has been developed. The results of an experimental study on the diagnosis of the formation of the information-thematic component of the information competence of future translators by applying the developed integrative testing system using the Moodle platform are presented.

Keywords: Information Competence, Integrated Testing System, Information Technology.

1   Introduction

1.1   Statement of the problem

At the stage of the formation and development of the information society, the main goal of training a specialist is not his traditional mastery of a certain qualification, but the

formation and development of a set of competencies that should enable him to adapt to the dynamic development of the modern world. Information competence refers to the key competencies that must be formed in the process of professional training future specialists, including translators. Therefore, it is relevant to study the characteristics of the formation of components of information competence and the search for effective ways to diagnose their formation. One of such ways is testing. The main task of testing is to ensure high informativeness of test results, monitoring the dynamics of learning, accumulation of data for the formation of a pedagogical forecast. It becomes an increasingly important component of the pedagogical diagnostics system, especially, with the use of appropriate tools that are part of distance learning systems.

1.2 The purpose of the article

The purpose of the article is to consider an integrated system of testing the formation of the information-thematic component of the information competence of future translators, to determine the stages of testing and types of test tasks for each of the stages. The developed testing system is presented on the example of studying specialized terminology and monitoring students' knowledge.

1.3 Literature review

Issues of development, use and effectiveness of test control in the educational process of higher educational institutions investigated both domestic and foreign scientists. Theoretical analysis showed that their studies are devoted, in particular, to cloud technologies transforming educational process (Arnold E. Kiv, Vladimir N. Soloviev, Serhiy O. Semerikov) [9]. In their opinion, there is urgent general need for principled changes in education elicited by current e-learning tools, services and IT communication.

The substantiation of the theoretical and methodological foundations of designing a computer-oriented system for pedagogical diagnostics of future teachers of natural and mathematical specialties was made by Oleksandr H. Kolgatin [10]. The author states that pedagogical diagnostics in the educational process is based on modern methods of pedagogical measurements using testing technologies. However, it is necessary to improve pedagogical measurements in the aspect of adaptive strategies for automated testing, to develop new approaches to assessing deviations of test results in conditions of individual test formation for each student.

Oleksandr S. Burlakov, Iryna M. Mushenyk [7] considered the assessment of the quality of test tasks for diagnosing students' knowledge of economic specialties by means of the Moodle distance-learning environment. They emphasize that the process of streamlining the control and evaluation of the quality of educational achievement has initiated the widespread use of test technologies at all stages of the learning process. In particular, the authors paid attention to complex issues (system) approach to solving the problems of examination of the quality of test problems using modern information and communication technologies.

Liudmyla I. Bilousova, Oleksandr H. Kolgatin, Larysa S. Kolgatina developed the principles of building an automated pedagogical diagnostic system. They have designed methods of the pedagogical diagnostics, which satisfy following demands: different forms of the intellectual activities of an examinee are attracted in process of testing; the automated system of the pedagogical diagnostics ensures its diagnostic abilities at wide differences of the examinees mastering; processing of the test results provides maximum information for an examinee and a teacher to correct the educational process [6]. Olha V. Avramenko et al. [5] studied the adaptation of educational measurements, including testing, to EU standards.

Foreign researchers (Lambrini Loumbourdi [11]) note that over the past few years there has been a real renaissance of testing as a measure of the level of knowledge acquired by students. This method of assessment is increasingly used in the daily practice of European and especially American universities. Frank Adamson, Linda Darling-Hammond justify the new assessment: tests based on open-ended questions [1]. Scholars believe that it is important to focus on strategic resources that promote equitable access to quality teaching for all students and the evaluation of their learning outcomes.

1.4　　Research methods

To achieve the purpose of the article, a number of methods were used. The purpose of the theoretical analysis a theoretical analysis of the scientific literature on the problem of testing the knowledge and skills of students in the educational process was to determine the degree of investigation of the problem under study. We used the descriptive method to expose our informational competency testing system. Empirical research methods were aimed at determining the effectiveness of the proposed integrated testing system.

2　　Results and discussion

Exploring the possibility of testing to determine the level of formation of information competence components of translators [13], we will discuss in more detail the example of one of them, namely the information-thematic. The information-thematic component of information competence is directly related to the mastering terminology. This is because of the correct use of terminology is crucial for the quality of the translation, regardless of the content of the translated text. This ensures consistency between the source and target languages, the efficiency and adequacy of the translation.

After all, discrepancies in the translation of terminology may adversely affect the translation and, consequently, cause difficulties in the work of those specialists for whom the translation of documentation was carried out. Incorrect translation of specialized terminology can cause difficulties in work based on the use of translated materials and even cause production problems. Considering this, we think, that the study of effective ways of working with terminology is a necessary and important aspect of the training future translators.

It should be noted that the essence of the information-thematic component of information competence is to acquire linguistic, thematic and background knowledge, the ability to form electronic databases of reference terminological materials for translation using automated translation systems, in particular, cloud-based [12]. It implies the ability to search for relevant information to better understand the thematic aspects of the document; expanding one's own knowledge in the field of specialization (owning a system of concepts, argumentation methods, presentation techniques, language control, terminology, etc.). The saturation of specialized texts with terms especially actualizes the question of the orientation of the professional training future translators towards the formation of a terminological base both in the aspect of studying and controlling the mastery of terminology.

One of the ways to form the information-thematic component of information competence in the aspect of studying terminology can be the use of thematic networks. Such an innovative approach was declared, in particular, in the "Framework for the German language for professional communication for higher educational institutions of Ukraine" [4] created in the framework of an international project. The participants of the project are Bosnia and Herzegovina, Italy. Along with the development of communicative competence and professional orientation, the program provides the design of thematic networks for determining the content of training, which can be carried out through joint discussion by teachers and students. The concept of the aforementioned Framework Program provides for the possibility of choosing terminology that will be studied by future translators depending on the specifics of their training at a particular university.

The areas of communication specified in the Common European Framework of Reference for Languages [8] should be taken into account when choosing themes and situations, have interdisciplinary correlation, that is, to establish links between foreign language terminological training and the courses of the student's curriculum. Thematic networks and the authenticity of educational materials are the main criteria for the selection of specialized texts. When forming the content of practical classes can be used: detailed lists of types of texts for different specialties; language actions with a strong focus on professional language; schematic plans for specific themes; suggestions on the main thematic aspects of terminology.

When creating such networks, the choice of thematic content is carried out in the direction from the general thematic sphere by detailing to specific themes depending on the coordination of students' interests and the goals of applying the gained knowledge in professional activities. We will demonstrate the formation of a thematic network in German using the example of the thematic area "Electrical equipment" (see Fig. 1). The given network provides eight possible directions of specialization for forming the terminological base of the future translator.

Since the document "Common European Framework of Reference for Languages: Learning, teaching, assessment" is a practical mechanism for determining clear standards of language competence, communication skills and knowledge that are recognized throughout Europe, we are guided by these standards in the development of training courses and control tasks, including tests. The test refers to tasks that have a specific organization, which allows all students to work simultaneously in the same

conditions and record the execution with symbols. The test is defined as a system of tasks of a specific form, a certain content, and increasing complexity, which allows us to objectively evaluate the structure and qualitatively measure the level of language competence of students, and in our study, the level of the information-thematic component of information competence.
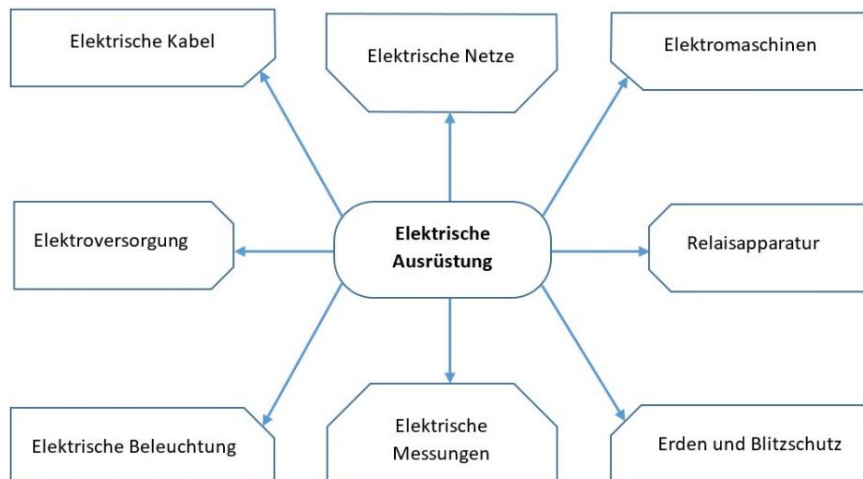
Fig. 1. The scheme of formation of the thematic network in German in the example of the thematic sphere "Electrical equipment"

Designing a testing system, based on one of the distance learning systems, for example, Moodle, it is necessary to develop a mechanism that will allow determining the level of information-thematic component of information competence, taking into account the following criteria:

— mastering the meaning of terminological units and their understanding;
— knowledge of the semantic valences of words and structures of a foreign language, the ability to choose adequate terms and use them;
— knowledge of uniqueness and polysemy;
— skills of differentiation of forms and means of language;
— ability to translate in a specific subject area based on the vocabulary of this area.

It is also worth to note that testing, unlike traditional forms of control, causes students greater interest and reduces stress levels, increases their cognitive activity and contributes to positive motivation to further studying foreign languages and developing the information-thematic component of information competence.

Testing the level of information-thematic component of information competence using the tools of the Moodle distance learning system has several advantages over traditional forms of control, namely:

— allows allocating time more efficiently, increasing its share of the study elements of the thematic network and reducing the time for the control procedure;

— allows covering the terminological material of the thematic network in test questions more fully;
— simplifies the procedure for determining the level mastering the terminology;
— provides the opportunity for regular monitoring at all stages of the learning process;
— provides an objective assessment by eliminating the teacher's subjective influence on the assessment of student's knowledge;
— diversifies the form of presentation of terminological material in test questions and answer options, including visualization.

However, it should be noted that the test control for these purposes also has certain limitations and disadvantages, in particular:

— tasks allow testing only knowledge of terminological units without their application in a broad context;
— the inability to automatically check the answer when using open questions that are effective in checking the peculiarities of understanding terminology in technical translation;
— the absence of an effective mechanism for analyzing the mistakes made, which may be systemic in nature and contain the probability of their further manifestation at a higher level of making translation decisions.

Therefore, to determine the level of development of the information-thematic component of information competence, tests must be developed based on a careful selection of material, various types of test tasks that will most fully ensure the implementation of this function. On the basis of this, the structure of the test is also formed, the time allotted for the test is determined, the scale of evaluation of test questions is developed depending on their level of complexity and the test as a whole.

Considering the above, the quality control process of training future translators in the information-thematic aspect should be carried out, in our opinion, using an integrated testing system. This system involves the use of various stages of test control, which are consistent with the logic of the organization of the educational process and the process of forming the information competence of the future translator based on the scheme of the developed thematic network. In particular, these are the following stages of testing: current, thematic, modular, final [3].

We will consider the use of an integrated testing system to determine the level of formation of the information-thematic component of information competence in the process of studying the course "Semantic and stylistic features of the translation of specialized texts" at certain stages. The content of this course provides the choice of modules with the further formation of terminological bases of agrarian terminology based on thematic networks [2]. In particular, in our example, there are such modules:

— electrical equipment;
— machines for harvesting grain crops;
— plant protection products;
— fruit and berry cultures.

We will consider the details of studying the content of these modules and test control of their acquisition using the example of the "Electrical Equipment" module, which includes one of the areas of the thematic network "Electric Lighting". A schematic structure of an integrated testing system is presented in Figure 2.
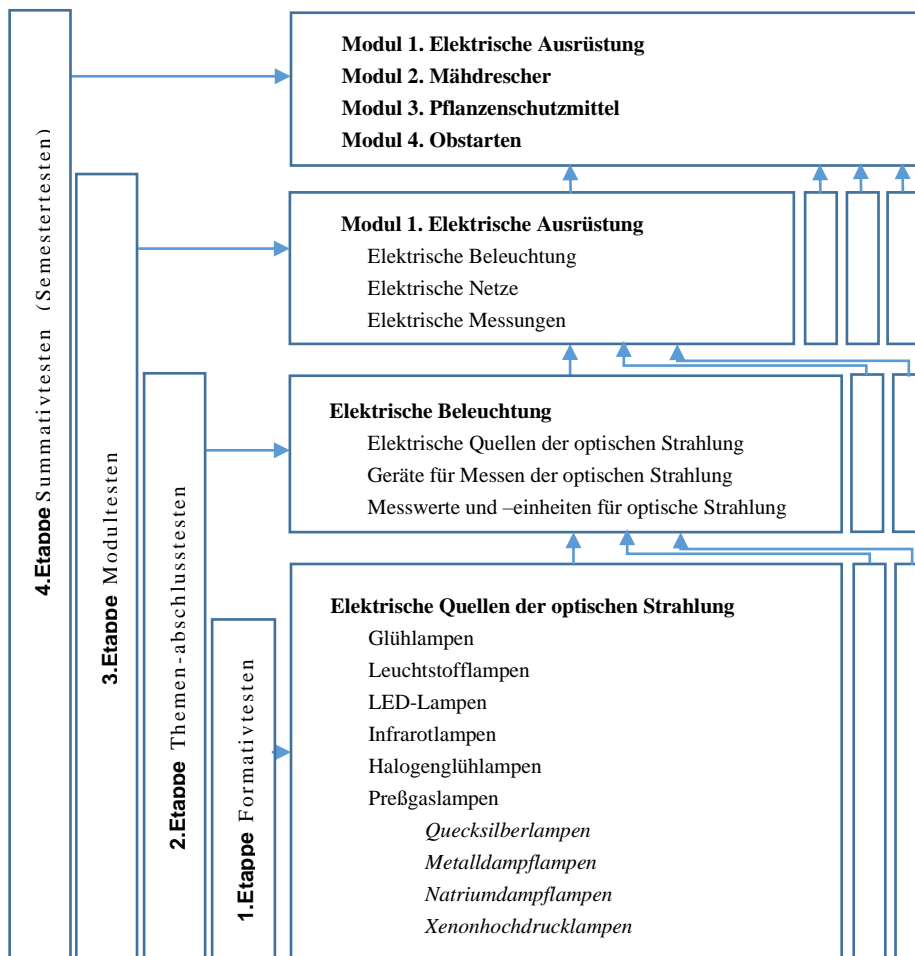
Fig. 2. Schematic structure of an integrated testing system

The first stage of testing (the current testing) involves monitoring the study of terms and the formation of the terminological base on the structure, characteristics and application of one of the types of electric lamp. The current test control is carried out systematically in the learning process. The goal is to get information about the acquisition of language material by students and the formation of their relevant knowledge.

The second stage of testing (the thematic testing) is a generalizing about thematic terminology on electric lighting (electric radiation sources, measuring devices, units of

measure, etc.). Thematic test control is carried out after the completion of work on all the themes that are defined by the thematic network in the "Electric Lighting" section. The main testing functions at this stage are controlling and evaluating. This type of knowledge and skills control helps to improve the quality of the educational process, because this determines the gaps in student's knowledge and carries out targeted adjustments of training to fill them.

The third stage of testing (the modular testing) is aimed at evaluating terminological knowledge within the framework of the "Electric Equipment" module, which will later be used to create electronic terminological databases of technical terminology.

The fourth stage of testing (the final (semester) testing) summarizes the measurement of the results of the formation of the information-thematic component of information competence to ensure professional translation of specialized texts.

When preparing tests for these stages of testing, it is advisable to use different types of test tasks, which allows us to achieve greater efficiency in the measurement of training results. As we know, test tasks are divided into two broad categories: closed and open type. Closed-end tasks contain questions and give answers to them. In this case, there may be tasks with one or several variants of correct answers. Test tasks with multiple choices allow determining a higher level of acquired knowledge due to the possibility of the student identifying the complex of correct ideas about the object, phenomenon, process, etc. with the simultaneous rejection of false options. In this case, the task offers a list of 4-6 answers to choose from.

In addition to the tasks of choice, assignment and correlation tasks should also be applied. In particular, questions that needed to be correlated as a response: a term in one language with its counterpart to another, a term with its image, a term with its definition, a multivalued term with context, were particularly effective in the context of diagnosing the formation of the information-thematic component of information competence.

The effective type of test tasks was open type tasks requiring independent recording of the answer, including in expanded form. In the case when the answer required writing in the form of one or two words, such tasks allowed their automated control during the test using distance-learning platforms. The inclusion in the tests of tasks that required a detailed response, although it made impossible their control in automatic mode, but allowed to reveal the ability of students to analyze language actions focused on the use of professional terminology.

The Moodle system as one of the possible variants of the program shell, in which there are tools for organizing and implementing test control, allows using a significant number of types of test tasks that are more or less appropriate for forming questions for testing knowledge at each level of the proposed integrated testing system. Among them, there is a sufficient set of types of test tasks of both closed and open type.

Based on experience, we believe that to form a base of test tasks for the proposed testing system the most successful are:

— in a closed form ("yes/no", "conformity in the figure", "multiple choice (in different versions – with the possibility of choosing one or several correct answers)", "overtightening the answers", "matching");

− in open form ("short answer", "essay").

When creating a comprehensive testing system, we made sure that we should rely on the following methodological principles, taking into account the following features:

− from simple to complex (for example, from the usual choice of the term from the proposed list to the reproduction of the term with the correct spelling);
− from concrete to abstract (for example, from visualization of the term to reproduction without visual support);
− from general science to narrow-sector orientation (for example, from the reproduction of the term in the commonly used version to the correct use in a particular context).

Because of these principles, we determined the most effective types of test tasks for monitoring the results of the formation of the information-thematic component of information competence at each of the testing stages. Based on certain types of test tasks, for each stage, a test task bank was created that contained such a number that ensured compliance with the basic requirements for the test (reliability, validity, discriminativeness).

In particular, at the first stage (the current testing) it is advisable to check the terminology acquisition with the maximum involvement of visualization and the simplest answers to the question. Such criteria correspond, in particular, to questions like "yes/no" and "conformity in the figure". Examples of tasks for the following types are presented in Figures 3, 4.
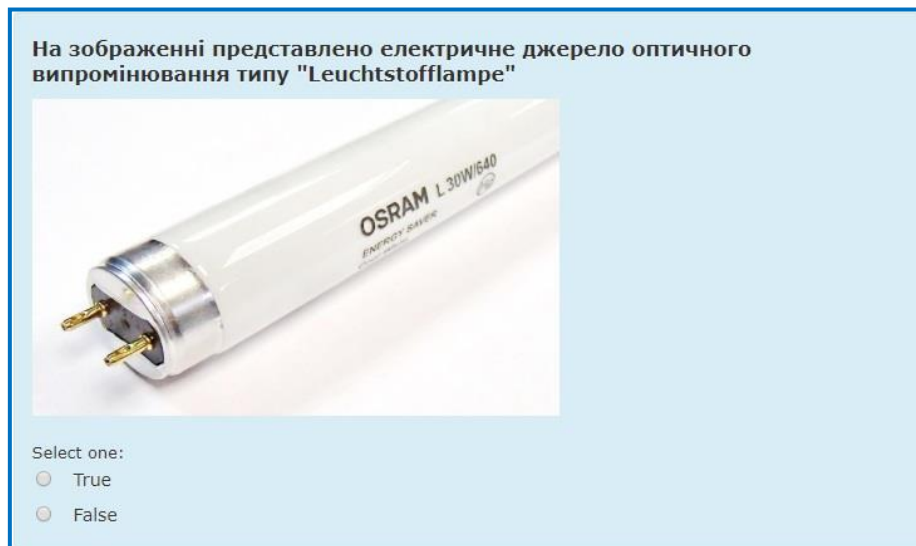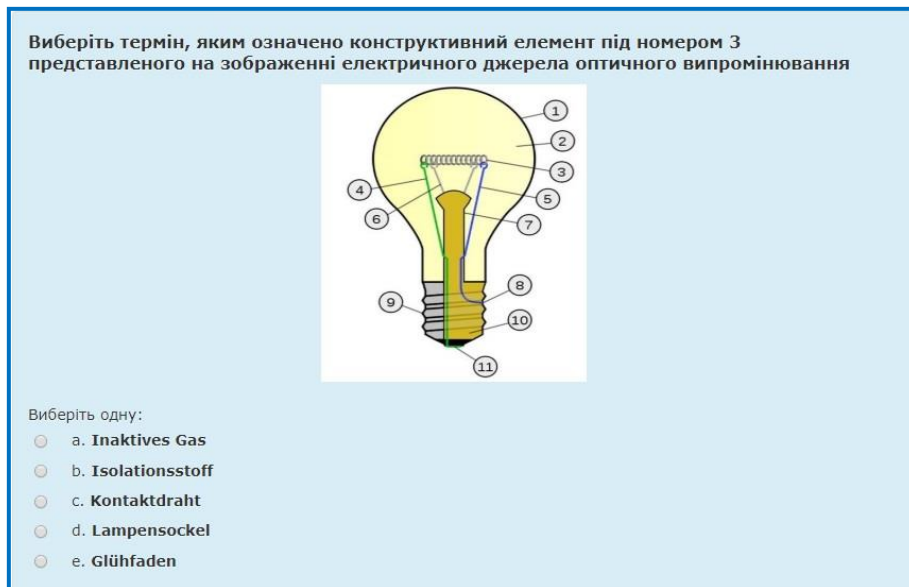

Fig. 3. An example of a test task for the first testing stage ("yes/no")

The second stage (the thematic testing) should summarize the formation of a terminological stock within a certain completed themes. This requires some

complication of both tasks and answers, but with the use of visual support. Questions like "multiple choice (one correct answer)" and "overtightening an answer" are best suited for this purpose. Samples of such questions in the Moodle system are shown in Figures 5, 6.

Fig. 4. An example of a test task for the first testing stage ("conformity in the figure")

Fig. 5. An example of a test task for the second testing stage ("multiple choice with one correct answer")

Fig. 6. An example of a test task for the second testing stage ("overtightening an answer")

Modular control is a milestone stage of the level control of formation of the information-thematic component of information competence. This implies a fairly higher degree of generalization of the study material, which is tested in test tasks for this level. In this case, they are complicated in such a way that besides the partially visualized, abstract forms of tasks are used. These requirements are satisfied, for example, with tasks like "multiple choice (one or several correct answers)" and "matching". Examples of tasks for the third stage of testing are shown in Figures 7, 8.

However, the final assessment of the levels of formation of the information-thematic component of information competence, which contribute to the development of the ability to translate scientific and technical texts, is possible only at the final testing stage. We have identified the following levels of its formation: reproductive; technologized; constructive; productive [5].

During the compilation of test tasks that will complement the test for this stage of control, it is necessary to provide the ability to control both the reproduction of the term with the correctness of its spelling and the adequacy of its use in accordance with the context. Such types of questions as "short answer" and "essay" are the most suitable for this. The possibilities of their use are shown in Figures 9, 10.

The control of the formation of the information-thematic component of information competence at each stage is carried out using tests, the basis of questions for which are the above types of test tasks. However, the combination of these types of tasks in tests was carried out not arbitrarily, but by a certain proportion. At the same time, the test tasks of the previous stages were part of the tests at the next stages. However, the number of evaluation points for the questions of the previous stage was twice lower than for the questions of the next stage.

Fig. 7. An example of a test task for the third testing stage ("multiple choice with one or several correct answers")
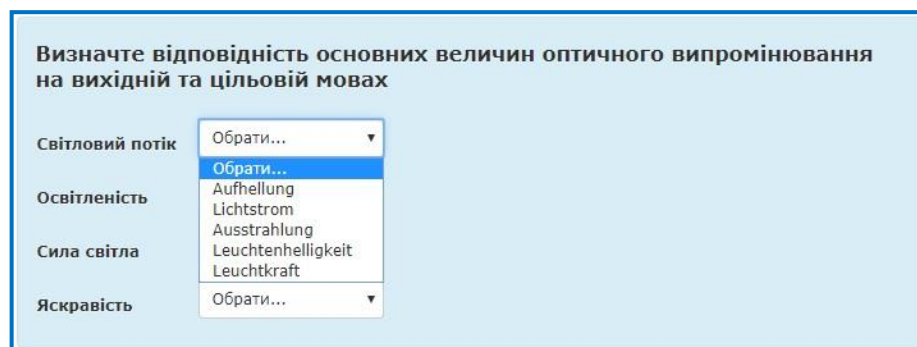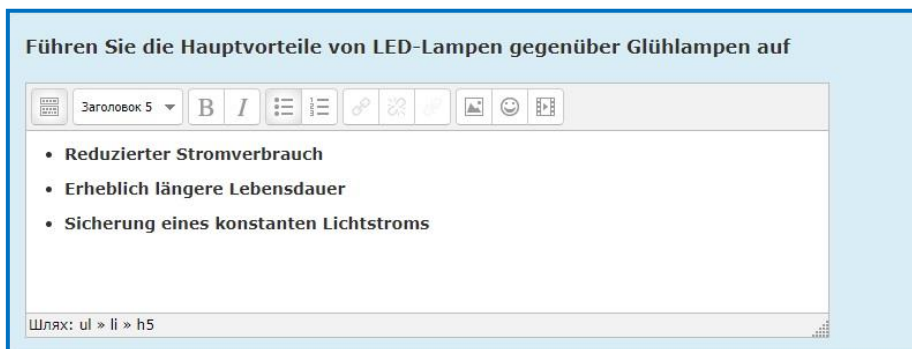

Fig. 8. An example of a test task for the third testing stage ("matching")

The percentage of test tasks selected from the task bank of each stage, in the tests for the corresponding stage, we determined in such a proportion:

— the first testing stage: 100% of tasks from the bank of the first testing stage;
— the second testing stage: 50% of tasks from the bank of the first stage and 50% of tasks from the bank of the second stage;
— the third testing stage: 30% of tasks from the bank of the first stage, 30% of tasks from the bank of the second stage and 40% of tasks from the bank of the third stage of testing;
— the fourth testing stage: accordingly 20% – 30% – 35% – 15%.

Fig. 9. An example of a test task for the fourth testing stage ("short answer")

Fig. 10. An example of a test task for the fourth testing stage ("essay")

This ratio of tasks in the tests at each stage due to the following considerations:

− a combination of questions from different banks in the test, that is, different types and different complexity, improves the accuracy of determining the level of formation of the information-thematic component of information competence due to their diverse evaluation;

− the testing stages outlined by us allow us to determine the level of formation of the information-thematic component of information competence as a whole. The presence of 100% correct answers at each stage indicates that the student has reached a certain level of formation of the information-thematic component of information competence;

− the set of tasks at the fourth stage of testing is defined so that it corresponds with the possible percentage of correct answers. This allows the diagnosing of the information-thematic component of information competence by level (20% – reproductive, 50% – constructive; 85% – technologized, 100% – productive).

An empirical study was conducted to determine the effectiveness of the proposed testing system. Diagnosing the development of the information-thematic component of the information competence of future translators was carried out by applying the developed integrated testing system using the Moodle system. 46 students of the fourth year of the bachelor program "Philology" were involved in the testing. The entry testing was carried out at the beginning of the study of the course "Semantic and stylistic features of the translation of specialized texts", and the final one after studying it. The obtained test results are presented in table 1.

Table 1. The results of testing to assess the level of formation of information and thematic component of information competence.

Levels	At the beginning of the course, %	At the end of the course, %
Reproductive	82,6	10,9
Technologized	15,2	21,7
Constructive	2,2	52,2
Productive	0,0	15,2

The use of the proposed testing system for entry testing allowed us to diagnose effectively the existing levels of formation of the information-thematic component of information competence. The data of this testing showed the prevalence of reproductive level among students, which was 82.6%. The technologized level was 15.2%, the constructive level was 2.2%, and the productive level was diagnosed in one of the students.

During the final testing, a high (productive) level of formation of the information-thematic component of information competence in 15.2% of students was diagnosed. 52.2% of students showed a constructive level, while 21.7% showed a technologized level. The use of this testing system made it possible to establish that the reproductive level of the quality studied remained at 10.9% of students.

3   Conclusions

Analysis of the test results gives grounds to assert that it is possible to identify changes in the formation of certain components of information competence, and, accordingly, the feasibility of implementing an integrated testing system in the process of training future translators. The integrated testing system developed by us, which provides for the monitoring of students' terminological training, is based on thematic network resources on the chosen specialization of the thematic field, determining test stages and types of test tasks in accordance with these stages. This system allows you to determine the level of formation of information and thematic component of the information competence of future translators.

Ensuring the accuracy of determining the level of formation of the information-thematic component of information competence can be achieved by combining questions from different banks, that is, of different types and complexity. The study showed that the combination of different types of tasks in the tests should not be arbitrary, but formed in a certain proportion. Moreover, the test tasks of the previous stages make up the corresponding part of the tests in the next stages. When developing a testing system, the ratio of test tasks, selected from the bank of tasks of the preliminary stage, and new tasks in the tests of the next stage was determined. It is also advisable to use visualization, which diversifies the presentation of terminological material in test questions and answer options.

It is proposed to take into account the following skills in a testing system using the Moodle system: mastering the meaning of terminological units and their understanding; knowledge of the semantic valences of words and structures of a foreign language; ability to choose adequate terms and use them; knowledge of uniqueness and polysemy; skills of differentiation of forms and means of language; ability to translate in a specific subject area based on the vocabulary of this area.

Further studies may be related to the study of the features of using an integrated testing system for diagnosing the formation of other components of the information competence of future translators.

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