



OPTIMIZING DISTANCE TESTING IN THE MOODLE SYSTEM

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Abstract.

Relevance: on the basis of the conducted analysis it has been established that nowadays the lecturer needs to possess the means, methods and technologies of distance learning. A lecturer's activity during the organization of distance learning is subject to significant changes. His primary task is to prepare a distance learning course, based on existing sources, original author's works, which are included in its thematic sections. The article deals with the analysis of research degree of the problem of developing and using an electronic form of test control of a learning level in the Moodle system.

Aim: to substantiate the methodology of using the Moodle Converter software to optimize the process of remote testing in the study of subjects.

Methods: analysis and synthesis – to find out the state and level of development of the problem under study; generalization – to formulate conclusions and recommendations about teachers' readiness to use the Moodle Converter program; diagnostic (questionnaire, conversation) – to study information about the teachers' readiness to use the program "Moodle Converter" in an educational process.

Results: the program "Moodle Converter" was developed, which realized the functions of files converting and software testing. It has been established that despite the simplicity of an outlined system, there are some difficulties with a rational use of time while preparing test tasks. Accordingly, the material has been presented on the development of an information technology of an automatic input of test data into a distance Moodle system, as well as the approbation of a mentioned technology. Information about the author's program testing in higher education institutions is presented.

Conclusions: it has been found that a large number of surveyed lecturers have some difficulties with creating tests in the Moodle remote system. At the same time, the experiment showed that using "Moodle Converter" creates the preconditions for optimization of the mentioned process, it becomes possible to save considerable time for preparation of test tasks, which can be used at different stages of classes.

Keywords: *distance learning, testing, Moodle system, test control, Moodle Converter.*

Introduction. A rapid development of digital technologies facilitates human activity in all spheres of life. A modern educational environment also cannot be imagined without informatization and computerization. New digital technologies help to learn educational material better, use time rationally, optimize individual and independent work of both a teacher and a student.

One of the most striking examples of modernization of a modern educational system using digital technologies is the implementation of distance learning. Distance learning is a remote extensive

system of knowledge transfer using various tools and technologies, which help students obtain the necessary information for the use in practice (Dolynskyi, 2010, p. 202). It is a form of organization of an educational process, which is based on an independent work of students and the use of modern information and communication technologies. Distance learning should educate a person, who has the desire and ability to communicate, learn and self-educate. So, the issues, related to the improvement of existing distance learning platforms seem to be relevant.

Sources of research. The problem of distance learning organization is deeply revealed in the works of T. Anderson, M. Rosenberh, V. Bykov (2015), Ye. Dolynskiy (2010), N. Morze, V. Kukharenko, Y. Bohachkov, Y. Tryus, B. Shunevych. The issues of distance learning methodology were considered by N. Klokar (2012), R. Maier, as well as N. Syrotenko, O. Rybalko. Management of the distance learning system was studied by T. Kravchynska (2017), S. Sysoieva, V. Osadchyi, K. Osadcha. Peculiarities of the organization of technical support of distance learning are covered in the works of P. Brokwell, R. Davis, P. Kiellier.

Analysis of the research results on this issue allowed us to understand the main advantages and disadvantages of using information and communication technologies in the establishments of higher education.

The purpose of the article is to substantiate the methodology of using the software "Moodle Converter" to optimize the process of distance testing in the study of academic disciplines.

Research methods: analysis and synthesis – to determine the state and level of development of the problem under study; generalization – to formulate conclusions and recommendations on the readiness of teachers to use the program "Moodle Converter"; diagnostic (questionnaire, interview) – to study the information about the state of readiness of lecturers to use the program "Moodle Converter" in an educational process.

Results and discussion. A growing popularity of distance learning in different countries seems logical.

A striking example is the virtual universities, created in the United States of America and Canada. In contrast to traditional forms of education, a student has the opportunity to take basic distance learning courses at any university. In European countries, there are also open universities of distance education, i. e. a group of educational establishments implementing distance learning programs (Bykov, Hrytsenchuk and Zhuk, 2015, p. 78).

Methodology of such training presupposes the use of new digital technologies, which include satellite television, computer networks, multimedia, etc.

Ukraine has also implemented distance learning, which is regulated by the Regulation on Distance Learning of April 24, 2013 (Verkhovna Rada of Ukraine, 2013). According to the Regulation, distance learning acts as a separate form of learning, and as an auxiliary one when using traditional forms: full-time, part-time, etc. The training of distance learning specialists requires a separate permit from the Ministry, but the decision to use distance learning technologies as an auxiliary form for traditional ones is made by

the educational establishment itself. It made it possible to implement the Moodle system in an educational process.

According to T. Kravchynska, a distance learning system Moodle has become the most widespread among such programs. The main characteristics of the system that determine its popularity among software of this type are: advanced functionality (the presentation of material, knowledge testing, the analysis of listener's activity, ease of updating the content; the ability to create copies, high stability); tools for developing and editing educational content, integration of various educational materials for various purposes and support for the international standard SCORM – the basis for the exchange of electronic courses, which provides the transfer of resources to other systems (from other systems); the availability of a set of blocks of material in training courses that can be used in other courses; intuitive interface and learning technology (the ability to easily find the help menu, the easiness of move from one section to another, the instructor's tips, etc.) determine the convenience and easiness of use of the system; the availability of the Moodle.org website, which is the so-called information battery, a platform for exchanging opinions among Moodle users – any system administrator, lecturer, researcher, designer or developer. The site is constantly evolving to meet the needs of society (Kravchynska, 2017, pp. 123-124).

A system Moodle is distributed under the GNU Public License and has an open code (Open Source), which allows a free use of the software. Moodle belongs to the Learning Management System class, used to develop, manage and distribute online learning materials with shared access. Materials are created in a visual educational environment with the task of sequence of study. A program interface is translated into more than 75 languages, including Ukrainian.

Using Moodle, a lecturer can create courses, filling them with material in the form of texts, supporting files, presentations, questionnaires, etc. Based on the results of students' tasks, a lecturer can give grades and comments (Klokar, 2012, p. 39). Thus, the Moodle system may be used both as a centre for creating educational material and to provide interaction between participants of an educational process.

Despite the simplicity and adaptability of the web-interface, preparation for work in the Moodle system is still time-consuming. In particular, in our opinion, the form for creating distance testing is quite inconvenient. A distance testing is a progressive form of learning that allows the assessment of students' academic achievements to be more effective and fair. The use of distance testing in comparison with other means of control has a number of advantages (Bilousova and Kolhatin, 2008, p. 119):

universality, the possibility of application at all stages of a learning process;

objectivity, which has a positive stimulating effect on an educational activity of students;

the possibility of its use not only to control knowledge, skills and abilities, but also to improve the quality of a professional training of students in general.

Thus, a distance testing is not only a means of obtaining the necessary information about the dynamics of processes taking place in the establishments of higher education, but it also performs the function of motivation, and, hence the management of cognitive activity of students.

Therefore, to simplify the introduction of test tasks and glossary, in a distance system Moodle, we have developed software "Moodle Converter". The C# programming language and Windows Presentation Foundation technology were used to implement the program. The author's program has the following structure: Home page and Xaml containers, Windows UI controls, C# code, a deployment package.

The program interface is developed in the file "MainWindow.xaml". The Xaml – Grid container was used to compose the main page. To implement the conversion Windows UI controls: StackPanel, Menu, RichTextBox, DockPanel, Button were used.

The code was written to manipulate the controls. For the main functions, the code looks like this:

– the function "Create test"

```
private void CreateTest_Click(object sender,
RoutedEventArgs e)
{
    try
    {
        Options_Click(sender, e);
        string richTextQuestions = new
TextRange(richTextBox.Document.ContentStart,
richTextBox.Document.ContentEnd).Text;
        string richTextAnswers = new
TextRange(richTextBoxAnswers.Document.ContentStart,
richTextBoxAnswers.Document.ContentEnd).Text;
        CompleteTest = Core.Convert.ToGift(richTextQuestions,
richTextAnswers);
        Save_Click(sender, e);
    }
    catch
    {
        MessageBox.Show("Перевірте форматування тесту та
відповідей!", "Помилка");
    }
}
```

– the function "Create glossary"

```
try
{
    string richTextQuestions = new
TextRange(richTextBox.Document.ContentStart,
richTextBox.Document.ContentEnd).Text;
    List<string> ListQuestions = new
List<string>(richTextQuestions.Split(new string[] {
Environment.NewLine }, StringSplitOptions.None));
    List<string> listTerm = new List<string>();
    for (int i = 0; i < ListQuestions.Count() - 1; i++)
```

```
{
    if (ListQuestions[i] != Environment.NewLine &&
ListQuestions[i].Contains(" - "))
    {
        listTerm.Add(ListQuestions[i].Substring(0,
ListQuestions[i].IndexOf(" - ")));
        listTerm.Add(ListQuestions[i].Substring(ListQuestions[i].IndexOf("
- ") + 3));
    }
    else
    {
        i++;
    }
}
xDocument = Core.Convert.ToXml(listTerm);
Save_Click(sender, e);
}
catch
{
    MessageBox.Show("Перевірте форматування
Глосарію!", "Помилка");
}
– the function "Export test"
private void GiftToTxt_Click(object sender,
RoutedEventArgs e)
{
    try
    {
        Open_Click(sender, e);
        richTextBox.AppendText(Core.Convert.ToTxt(xDocument).ToString());
    }
    catch
    {
        MessageBox.Show("Виникла непередбачена помилка",
"Помилка");
    }
}
– the function "Export glossary"
private void GlossaryToTxt_Click(object sender,
RoutedEventArgs e)
{
    try
    {
        Open_Click(sender, e);
        richTextBox.AppendText(Core.Convert.ToTxt(xDocument).ToString());
    }
    catch
    {
        MessageBox.Show("Виникла непередбачена помилка",
"Помилка");
    }
}
– the function "Random order"
private void Random_Click(object sender,
RoutedEventArgs e)
{
    try
    {
        Open_Click(sender, e);
        richTextBox.AppendText(Core.RandomLine.RandomQuestions());
    }
    catch
    {
        MessageBox.Show("Перевірте форматування
тесту", "Помилка");
    }
}
```

The program can be used to work with a distance education system Moodle version 3.7.2 and previous versions. To use the program you need to create a new document or open an existing one using the appropriate menu items, you can also drag a text file to the appropriate area of the program. The program provides the ability to create a test or glossary for a Moodle system from a text file, convert a GIFT or XML file into a text file, randomly arrange the questions and answers of an open test.

The file for conversion must meet the requirements:

- to converse a text file to a GIFT file, the questions must be separated according to the settings, the answers must be on the right side of the window (numbering is optional);

- to converse a text file to an XML file, the definitions and meanings must be separated by a hyphen or paragraph;

- conversion in a text file does not require additional settings.

To use the "Random order" function, the file must meet the items in the settings.

Also, when saving the file, you need to pay attention to its format.

Software user manual

To create and import a test in Moodle, you need to follow these steps:

1. Open a text file with the tests by clicking File-Open Document or "Open" on the toolbar. Copy the answers to the appropriate area on the right. The result is shown in *fig. 1*.

2. Click "Create Test", a settings window will appear in which we select the appropriate formatting of our file. Then click "OK", the file is automatically converted and a window for saving the file appears, select the format * .txt and save (*Fig. 2*).

3. Open Moodle, move to the training course, create a new test or select an existing one, on the control panel, select "Question Bank" -Import and import questions (*Fig. 3*).

4. Imported questions can be added to the test via a control point "Edit test" by clicking "Add" from the Question Bank (*fig. 4*).

To create and import a glossary in Moodle, follow these steps:

1. Open a text file with the definitions by clicking File-Open Document or "Open" on the toolbar. The result is shown in *fig. 5*.

2. Click "Create Glossary", a settings window will appear, in which we select an appropriate definition division. Then click "OK", the file is automatically converted and a window for saving the file appears, select the format * .xml and save (*Fig. 6*).

3. Open Moodle, move on to the discipline, create a new glossary or select an existing one, in a control panel, select Import records in "Question Bank" and import questions (*Fig. 7*).

To get the test in a text format with Moodle, follow these steps:

1. Export test from Moodle in GIFT format.
2. Open the exported test in the program.
3. Click "Export test" and select the way to save the text file.

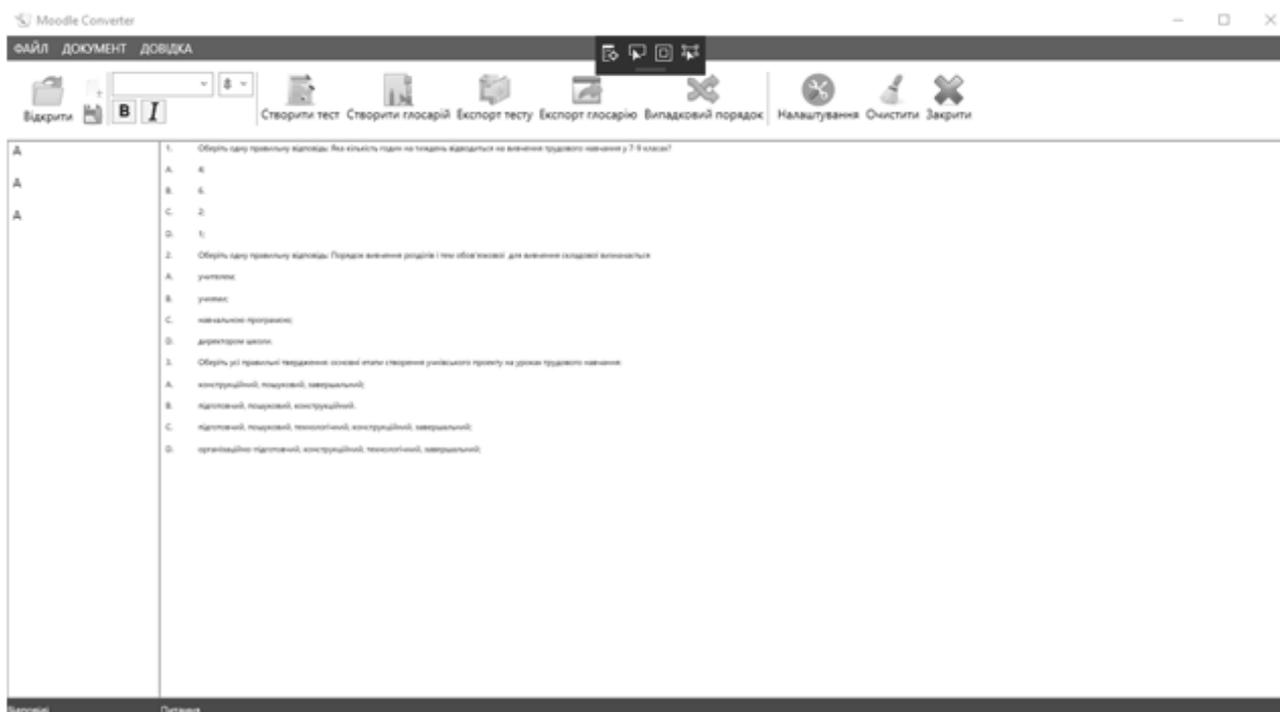


Fig. 1. Example of placing the test and keys

To get definitions from a glossary in a text format from Moodle, follow these steps:

1. Export glossary from Moodle.
2. Open an exported file in the program.
3. Click "Export Glossary" and select the way to save a text file.

To randomly arrange the questions and answers of the test, you must follow the steps:

1. Open a text file with the tests by clicking File-

Open Document or "Open" on the toolbar. Copy the answers to the appropriate area on the right.

2. Click "Random selection", a settings window will appear, in which we select an appropriate formatting of our file. Then click "OK". We get the result in text fields.

The notion "readiness of the lecturer to use test technologies" is considered as an integrated formation of personality with a systemic

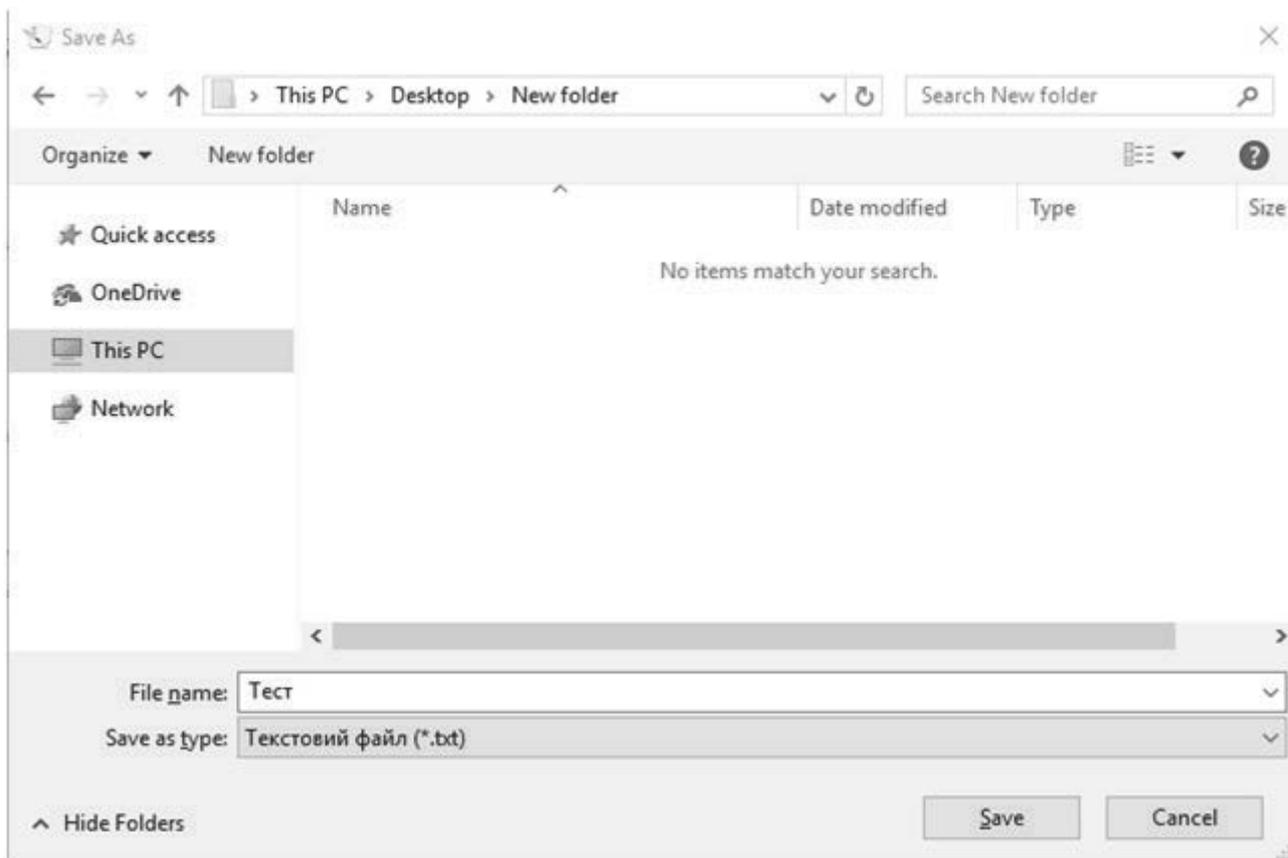


Fig. 2. Test save window

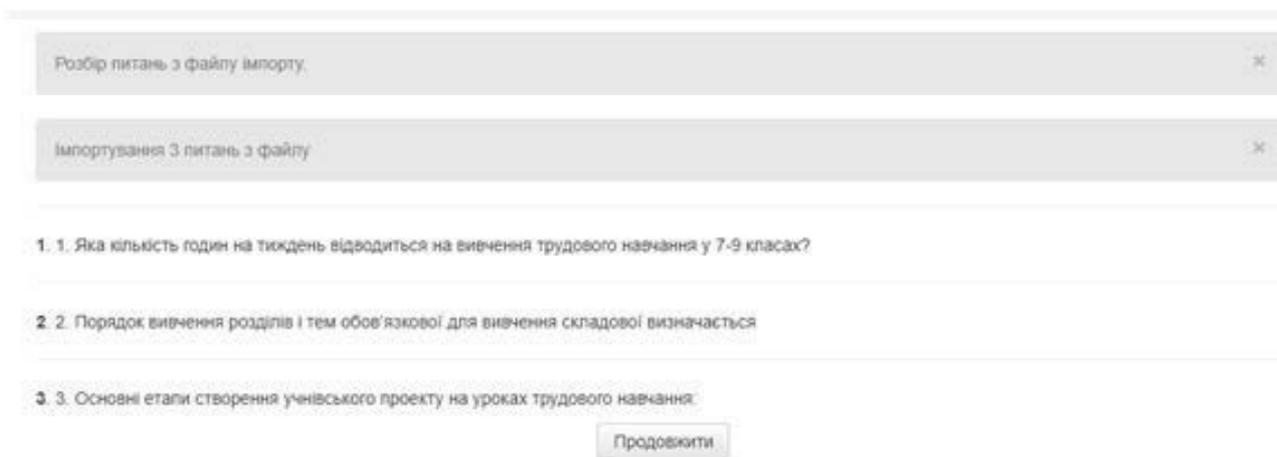


Fig. 3. Import of tests

organization, a multilevel structure consisting of interconnected motivational, cognitive and operational components, the formation of which will allow the teacher to successfully use test technologies in a professional activity for the organization, management and control of students' educational and cognitive activity (Fihurska, 2011).

In order to study the readiness of teachers to use tests in the Moodle system, a questionnaire was conducted, which involved 52 lecturers of Pavlo Tychyna Uman State Pedagogical University. The questions of the questionnaire concerned the role of a test control in an educational process, the functions of testing in an identified level of students' academic achievement, the use of testing in Moodle, the implementation of communication "student – teacher" when working in Moodle and the difficulties, encountered in creating tests in Moodle.

According to the results of the questionnaire, it was found that: 53% of lecturers are ready to use testing in

the Moodle system; 35% of lecturers have difficulty in creating appropriate tests; 12% are not ready to use testing in a mentioned system.

After the lecturers were given the opportunity to use an author's program Moodle Converter in their professional activity, a questionnaire was reconducted. The results showed that after using the program, difficulties in creating tests occur in only 15% of lecturers. The number of lecturers, who testified to their readiness to use testing in the Moodle system was 82% (Fig. 8).

Conclusions. There is no doubt that a current trend in the organization of distance learning is the creation of information and educational environment in establishments of education and the conditions for its service support. A developed author's program "Moodle Converter" creates prerequisites for optimizing the process of distance testing in the study of academic disciplines. The versatility of the program is that it provides the ability to convert GIFT and



Fig. 4. Adding tests from the Question Bank

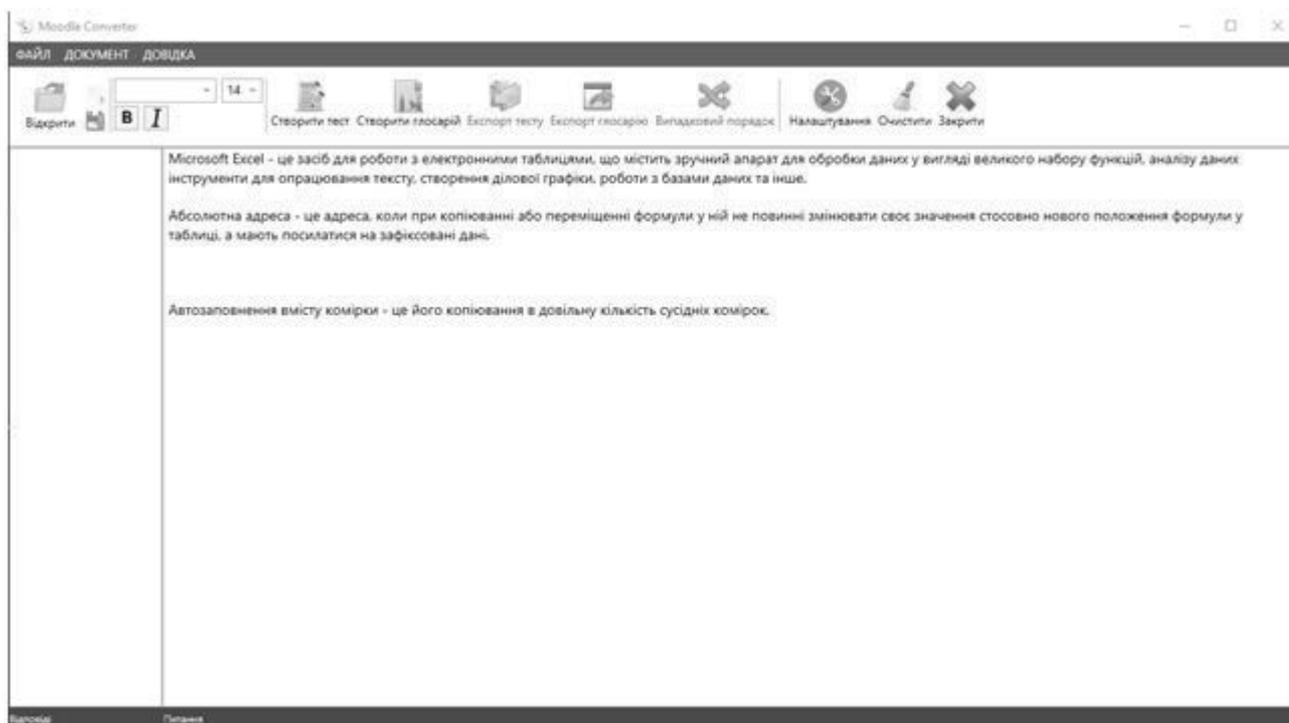


Fig. 5. An example of an open glossary

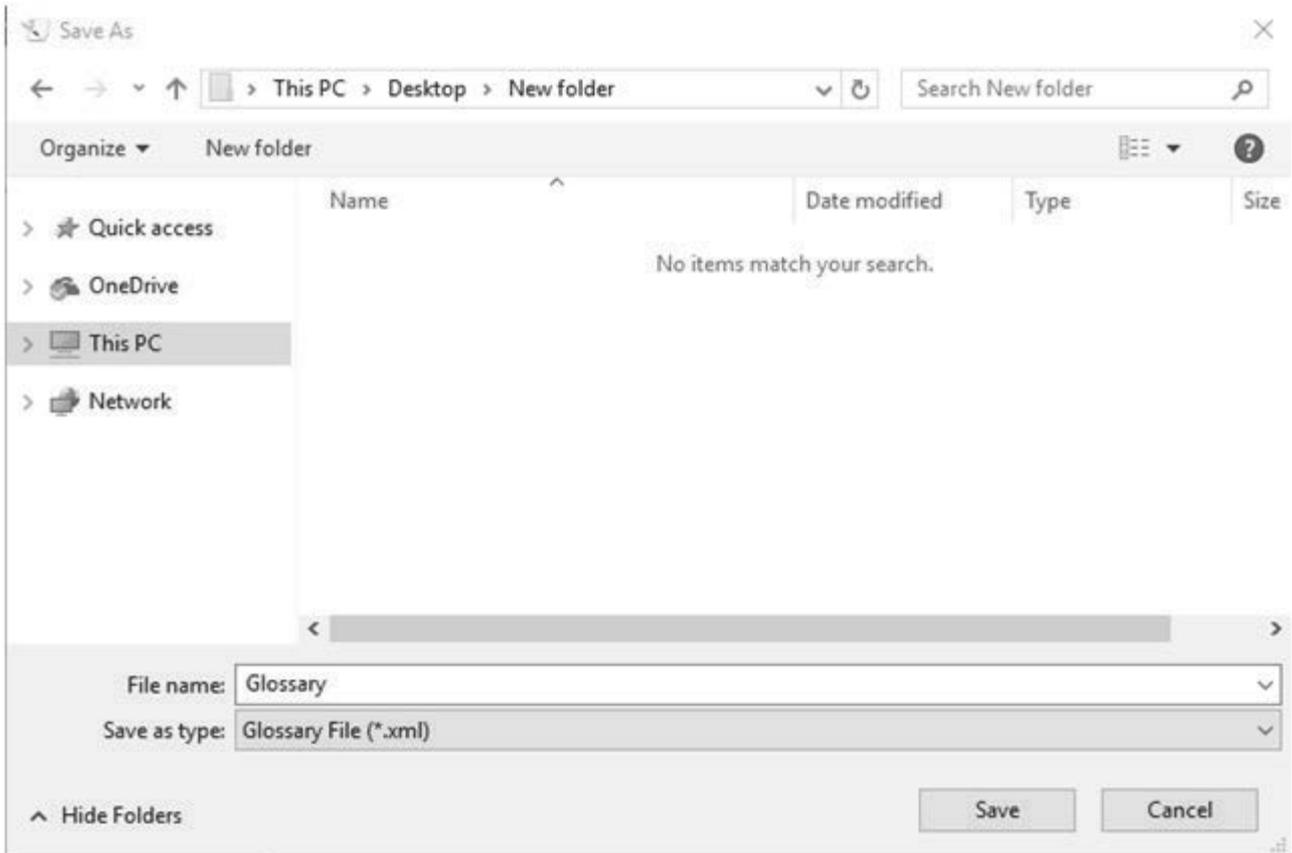


Fig. 6. Glossary save window

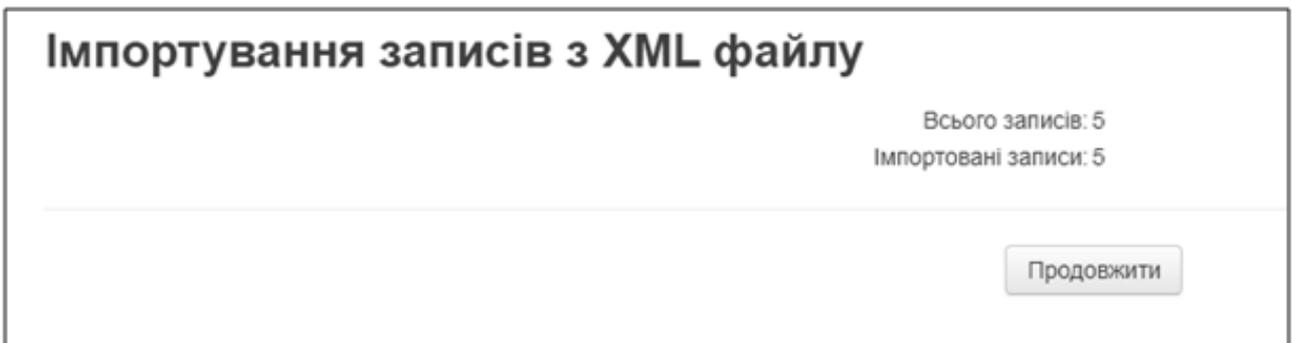


Fig. 7. Records importing from an XML file

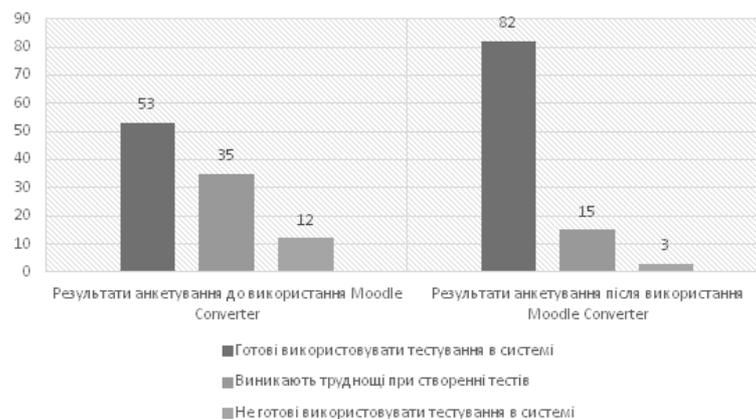


Fig. 8. The readiness of lecturers to use tests in the Moodle system

XML files into a text file. Moodle Converter can be used to work with Moodle distance education system version 3.7.2 and earlier. The use of a developed program by teachers contributed to the formation of their readiness to use testing in the Moodle system.

Further work can be aimed at implementing such functions as the ability to create tests using images, the ability to create tasks "Identify missing words", "Matching".

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Оптимізація дистанційного тестування в системі Moodle

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Реферат.

Актуальність: в умовах сьогодення викладачу необхідно володіти засобами, методами і технологіями дистанційного навчання. Його першочерговим завданням стає підготовка дистанційного навчального курсу на основі вже існуючих джерел, оригінальних авторських наробок, які входять до його тематичних розділів. На особливу увагу заслуговує питання ефективності використання електронної форми тестового контролю рівня засвоєння знань.

Мета: обґрунтувати методику використання програмного забезпечення "Moodle Converter" для оптимізації процесу дистанційного тестування при вивченні навчальних дисциплін.

Методи: аналіз і синтез – для визначення розробленості проблеми, яка досліджується; узагальнення – для формулювання висновків і рекомендацій щодо готовності викладачів до використання програми "Moodle Converter"; діагностичні (анкетування, бесіда) – для вивчення інформації про стан готовності викладачів до використання програми "Moodle Converter" в освітньому процесі.

Результати: розроблено авторську програму "Moodle Converter", де реалізовані функції конвертування файлів і проведено тестування програмного забезпечення. Представлено матеріал щодо розробки інформаційної технології автоматичного введення тестових даних у дистанційну систему Moodle, а також апробації зазначеної технології. Проаналізовано сутність поняття "готовність викладача до використання тестових технологій". Представлено інформацію про апробацію авторської програми в умовах закладу вищої освіти.

Висновки: з'ясовано, що у значній кількості опитаних викладачів виникають труднощі із створенням тестів у дистанційній системі Moodle. Водночас експеримент показав, що завдяки використанню програми "Moodle Converter" створюються передумови для оптимізації згаданого процесу, стає можливою значна економія часу на підготовку тестових завдань, які можна використовувати на різних етапах занять.

Ключові слова: *дистанційне навчання, тестування, система Moodle, тестовий контроль, Moodle Converter.*

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