

# IMPLEMENTATION OF INTERACTIVE LEARNING TECHNOLOGIES TO THE EDUCATIONAL PROCESS

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## ABSTRACT

One of the ways of modernization in the educational system of Ukraine is the introduction of innovative pedagogical technologies and methods in the educational process. The most effective of them is the interactive learning, which is obtained in cooperation with all subjects of the cognitive environment, which requires the mandatory exchange of experience and thoughts. Interactive learning methods include e-learning, mobile learning, blended learning. The essence of interactive learning is co-teaching, where both student and teacher are equal subjects of learning and studying. A prime example of these techniques is the using of distance learning platforms in the learning process. College of Sumy National Agrarian University and Sumy National Agrarian University use the Modular Object Oriented Distance Learning Environment platform (Moodle) in the process of studying. The peculiarity of this platform is that it takes into account pedagogical aspects based on cognitive psychology, namely on the principles of constructivism. The Moodle Learning Environment contains tools for managing, teaching, communicating and evaluating the learning achievements of learners. The article deals with an example of using the Moodle in the study of Marketing research and investment project management. The author reflects how students can use course elements (theoretical training material; multimedia support; practical training material; assignments to individual work; testing) while studying. The author determines that the effectiveness of distance learning is based on the fact that students themselves feel the need for further learning, and are not subjected to pressure from parents, circumstances, the teacher and etc.

**Key words:** educational process, interactive learning, digital learning, distance learning, Moodle.

## 1. Introduction

The education system is related to the implementation of the process of dissemination knowledge and is an essential component of life. Education covers the activities of established

public institutes, which prepare young people for life using their obtaining knowledge from schools and universities.

The importance of education in human life is constantly increasing, and the need for a constant increasing the level of knowledge leads to the emergence of the concept of continuity of education in public life. This process is accompanied by the search for new forms and methods of teaching that contribute to the proper formation of the scientific outlook and a deep understanding of economic and social changes in society.

## **2. General characteristics of interactive teaching methods**

Transformation of education requires, first of all, need to find a solution of such pressing issues as human orientation, fundamental values, and democratization of education. As a solution we can use new methods of teaching such as interactive learning technologies. These learning technologies are coming to the aid of the classic technology of education.

The interactive means the principle of constructing and functioning of pedagogical, psychological, computer communication in the mode of dialogue. Implementing the technological principles of teaching, interactive pedagogical technology provides for both the interactivity of computer-aided learning and the interactivity of organizing a pedagogical process when the basic conceptual position is defined by learning based on interactive communication. An interactive model of learning involves the application of a technological approach, and we see it as the application of a set of interactive technologies, the common feature of which are the principles of interaction: multilateral communication, interaction and mutual learning of students, cooperative learning activities with relevant changes in the role and function of those who study and who teach. (Bessalova T.V., 2012)

Interactive learning can be divided into the following types:

- group studying;
- studying in the game;
- studying in the discussion;
- studying in form of training or conference.

Interactive technologies play an important role in modern education. Their advantages are:

- students learn all levels of cognition (knowledge, understanding of application, assessment);
- the number of students who consciously absorb the learning material in groups increases.

Students take an active position in learning, their interest in acquiring knowledge grows. The personal role of the teacher significantly increases - he acts as a leader. (Kovalynska I.V., 2012)

### **3. Distance learning and e-learning as the main components of interactive learning process technologies**

The development of information and communication technologies has led to the development of e-learning, mobile learning (m-learning) and blended learning. These methods are widely used in the process of education in higher education institutions. These technologies also allow for lifelong learning.

Distance learning is a new way of implementing the learning process, which is based on the use of modern information and telecommunication technologies, which allow learning at a distance without personal contact between the teacher and the student.

The main features of distance learning are:

- flexibility – students receiving distance education, they do not take regular classes but study at a convenient time and at a convenient location;
- modularity – the modular principle is the main principle of the distance education program. Each individual course consists of different parts – modules which teacher or student can use for individual or group studying;
- concurrency – training is carried out simultaneously with a professional activity (or with training in another direction);
- large audience – simultaneous access to many sources of educational information for a large number of students, communication through students` telecommunication channel with each other and with teachers;
- cost effectiveness – effective use of training facilities, concentrated and unified presentation of information, using and development of computer simulation should result in reduced training costs of new specialists;
- adaptability – using in the educational process new achievements of information technologies which contribute to the entry of a person into the world information space. (Anysymov A. M., 2009)

There are 4 types of subject in the distance learning system:

- the students – people who study;
- the tutors – people who teach;

- the organizer - one who plans educational activities, develops training programs, deals with students and tutors, etc.;
- the administrator - one who ensures the stable functioning of the system, solves technical issues, monitors the statistics of the system. (Polozhennia pro dystantsiine navchannia)

An important element of distance learning is the distance course. Before the start of teaching students, tutors develop distance courses in their subjects. Courses can be modified and supplemented during the process of teaching. It is up to each teacher what the course will look like and what multimedia elements will be used in it. The extent and method of using computer technology in the preparation of the distance course significantly affects the efficiency of its assimilation. World experience shows that the use of dynamic objects to create visual models of processes, adaptive modeling of the student in many cases significantly increases the effect of learning. (Kontseptsiiia rozvytku dystantsiinoi osvity v Ukraini)

The course is divided into sections which students should completed Based on the sections; tutors create and assign tests and tasks that also need to be completed on time. The tutor has the ability to assign special testing (limit tests) to the relevant sections of the course. The tutor can assign tasks to individual subgroups of students or to the entire group. The interaction between the subjects of the distance learning system is carried out by elements of a system of individual guest books, forums, chats and e-mails. (Zakon Ukrainy «Pro natsionalnu prohramu informatyzatsii»)

Systematic work with the distance courses by students and teachers is required for the organization of truly effective distance learning.

#### **4. Practical experience of using distance learning technologies in the educational process**

Modular Object Oriented Distance Learning Environment (Moodle) is freeware education software. The peculiarity of this platform is that it takes into account pedagogical aspects based on cognitive psychology, namely on the principles of constructivism.

The following roles are set in Moodle:

- the student assumes the role of an active, self-acquired entity, forms his or her own system of skills, of course with the help of certain sources;
- the teacher who play the role of motivator and supporter, prepares materials for studying.

The Moodle system is one of the effective methods of interactive learning. This system allows acquiring new knowledge in cooperation of all subjects of cognitive environment. It requires a mandatory exchange of experience and thoughts between students or student and teacher. (Polozhennia pro dystantsiine navchannia)

The Moodle system is used to develop distance learning support for full-time and part-time students while studying “Marketing Research and Investment Project Management” at the College of Sumy National Agrarian University and Sumy National Agrarian University.

The Moodle Learning Environment contains tools for managing, teaching, communicating and evaluating the learning achievements of students.

Let's take a closer look at the elements of the Moodle Learning Environment.

Management tools can assign the user the role of an administrator, e-learning developer, or simple user. There are the following modes for users in creating of distance course:

- the administrator mode in which the installation and setting of distance course parameters are carried out;
- the teacher mode in which editing and supplementing of the distance course with new educational-methodical material is carried out;
- the student mode in which students work with educational-methodical material. (Anysymov A. M., 2009)

Assessment of educational achievements tools gathering of current and effective information about the student's educational activity in the distance course environment.

Task tools allow the teacher to ask a question that requires students to prepare an answer at the distance course environment for the purpose of obtaining a teacher's grade.

While using survey tools teacher can create a voting surveys, express polls or find a common opinion in the course during process of learning.

Self-study tools are the basis for students to self-control of their learning. It includes tests, lessons (lectures), explanations, and glossary.

Communication tools are intended for the organization of communication interactions of the distance course with the subjects of study. The learning process is not passive in nature, it is active and communicative.

The use of the Moodle as a platform for learning “Marketing Research and Investment Project Management” is very effective because the tools of platform open up new opportunities in learning activities. They allow to organize the learning process in a new way and to stimulate the motivation of learning. It helps to develop students' specific skills that cannot be formed at the stages of learning without the use of information technology.

The page of the course “Marketing Research and Investment Project Management” is presented in Figure 1.

## Marketing research and investment project management



Author: Shumkova V.I. PhD

Total hours: 90 h. (total), 14 h. (lectures), 10 h. (practice), 66 h. (independent work)

Form of final control: test.

Purpose of study: providing knowledge about the system, methods and algorithms for analyzing the internal and external business environment of enterprises, ways and reserves of their marketing development and obtaining skills for work in the field of investment, learning to plan, substantiate, organize and directly implement the investment process in the industrial sphere.

**Fig. 1. General view of the course “Marketing Research and Investment Project Management”  
(Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)**

The course “Marketing Research and Investment Project Management” consists of the following elements (Fig. 2):

- information about the author;
- syllabus for educational discipline;
- print and online sources;
- Glossary;
- theoretical training materials;
- multimedia support;
- practical training materials;
- assignments to individual work;
- testing. (Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

-  Information about lecturer
-  Working plan
-  Literature
-  Glossary
-  MRIPM tutorial
-  Research

## Module 1. Theoretical foundations of marketing research

### Lectures

-  Theme 1. Basic marketing
-  Theme 2. Marketing research
-  Theme 3. Marketing Research Questionnaire

### Practical classes

-  Practical class 1. Development of questionnaires and interviews
-  Practical class 2. Conducting research on marketing environment and competitors. Conducting a SWOT-analysis

### Individual work

-  Theme 1. Marketing's role in the business
-  Theme 2. Branding
-  Theme 3. Complex Market Analysis by Michael Porter

### Methodical support of the course

-  Theme 1. Basic marketing
-  Theme 2. Marketing research
-  Theme 3. Marketing Research Questionnaire

### Test

-  Test Module 1

Fig. 2. Source page of the course “Marketing Research and Investment Project Management” (Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

The Glossary tool allows to create a basic dictionary for using at the whole course. It adds to the distance course a flexible way of presenting definitions using hyperlinks, for example, to a forum where the term was defined in the discussion (Fig. 3).

A

activity-based cost (ABC)  
**activity-based cost (ABC)** accounting procedures that can quantify the true profitability of different activities by identifying their actual costs.





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B

bond  
**bond** - a bond acts like a loan or an IOU that is issued by a corporation, municipality or the U.S. government. The issuer promises to repay the full amount of the loan on a specific date and pay a specified rate of return for the use of the money to the investor at specific time intervals.





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brand  
**brand** a name, term, sign, symbol, or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors.





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business market  
**business market** all the organizations that acquire goods and services used in the production of other products or services that are sold, rented, or supplied to others.





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C

capital  
**capital** - the funds invested in a company on a long-term basis and obtained by issuing preferred or common stock, by retaining a portion of the company's earnings from date of incorporation and by long-term borrowing.





Fig. 3. A glossary for the course “Marketing Research and Investment Project Management” (Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

If the term described in this dictionary is included in the text of the course material, it will automatically become a reference. This link leads to the definition of the term. Thus, the student does not need to flip the entire course to find a forgotten definition (Fig. 4).

### 1. Marketing information system

The **Marketing Information System** refers to the systematic collection, analysis, interpretation, storage and dissemination of the **market** information, from both the internal and external sources, to the **marketers** on a regular, continuous basis.

The **marketing** information system distributes the relevant information to the **marketers** who can make the efficient decisions related to the **marketing** operations viz. Pricing, packaging, new product development, distribution, media, promotion, etc.

Every **marketing** operation works in unison with the conditions prevailing both inside and outside the organization, and, therefore, there are several sources ( viz. Internal, **Marketing Intelligence**, **Marketing Research**) through which the relevant information about the **market** can be obtained.



Figure 1. Marketing Information System

Fig. 4. References to the Glossary in the lecture

(Platforma dystantsiinohu navchannia Moodle koledzhu Sumskoho NAU)

The lesson (lecture) tool allows to submit educational material in an interesting and flexible way. It consists of a set of pages. Each page ends with questions or tasks for students. The student's answer allows him/her to go to the next or previous page. This system adapts to the student's academic achievements and has a non-linear structure (Fig.5).

Theme 3. Marketing Research Questionnaire

1. Questionnaire Design Process

**Questionnaire** is a systematic, data collection technique consists of a series of questions required to be answered by the respondents to identify their attitude, experience, and behavior towards the subject of research.

One of the most critical parts of the survey is the creation of questions that must be framed in such a way that it results in obtaining the desired information from the respondents. There are no scientific principles that assure an ideal questionnaire and in fact, the questionnaire design is the skill which is learned through experience.

The following steps are involved in the questionnaire design process:

- 1. Specify the Information Needed:** The first and the foremost step in designing the questionnaire is to specify the information needed from the respondents such that the objective of the survey is fulfilled. The researcher must completely review the components of the problem, particularly the hypothesis, research questions, and the information needed.
- 2. Define the Target Respondent:** At the very outset, the researcher must identify the target respondent from whom the information is to be collected. The questions must be designed keeping in mind the type of respondents under study. Such as, the questions that are appropriate for serviceman might not be appropriate for a businessman. The less diversified respondent group shall be selected because the more diversified the group is, the more difficult it will be to design a single questionnaire that is appropriate for the entire group.
- 3. Specify the type of Interviewing Method:** The next step is to identify the way in which the respondents are reached. In personal interviews, the respondent is presented with a questionnaire and interacts face-to-face with the interviewer. Thus, lengthy, complex and varied questions can be asked using the personal interview method. In telephone interviews, the respondent is required to give answers to the questions over the telephone. Here the respondent cannot see the questionnaire and hence this method restricts the use of small, simple and precise questions.
- 4. Determine the Content of Individual Questions:** Once the information needed is specified and the interviewing methods are determined, the next step is to decide the content of the question. The researcher must decide on what should be included in the question such that it contribute to the information needed or serve some specific purpose.

In some situations, the indirect questions which are not directly related to the information needed may be asked. It is useful to ask neutral questions at the beginning of a questionnaire with intent to establish respondent's involvement and rapport. This is mainly done when the subject of a questionnaire is sensitive or controversial. The researcher must try to avoid the use of double-barreled questions. A question that talks about two issues simultaneously, such as Is the Real juice tasty and a refreshing health drink?

3MCT

1. Questionnaire Design Process

2. Guidelines in Writing a Marketing Research Questionnaire

Fig. 5. Example of lecture to the course “Marketing Research and Investment Project Management”

(Platforma dystantsiinohu navchannia Moodle koledzhu Sumskoho NAU)

Task tool allows teacher to set up tasks that require students to respond in different ways at the platform. It lets teacher evaluate the answers, make adjustments, and comment (Fig.6).

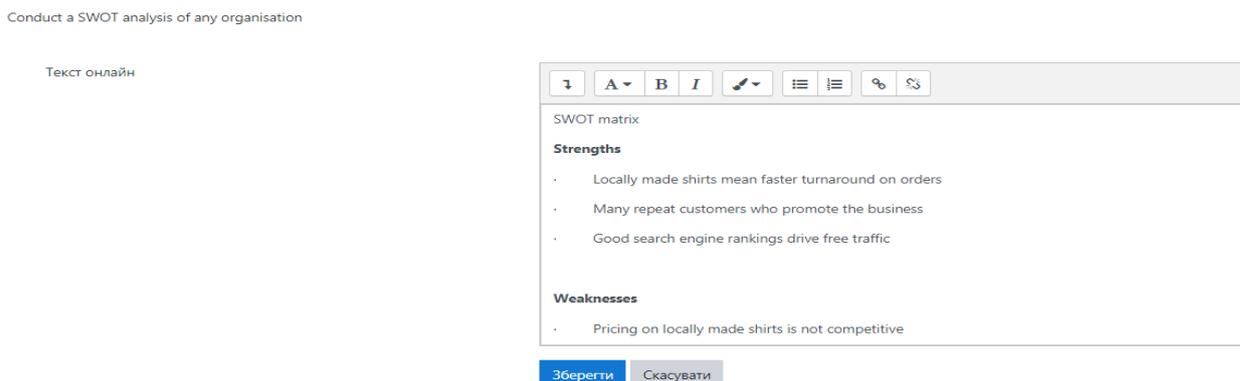


Fig. 6. Example of task to the course “Marketing Research and Investment Project Management” (Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

Quiz tool designed to control students' knowledge. The tests can be included directly into the course or allocated to a separate course. Creating tests in Moodle is about creating a test bank (of various types) and setting up test options. Processing of test results in Moodle is performed automatically (Fig. 7 and Fig. 8).

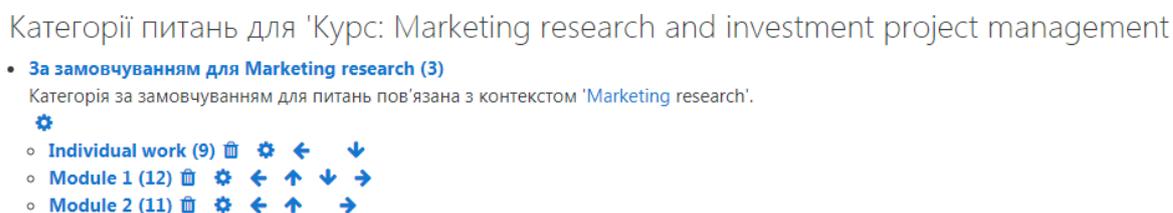


Fig. 7. Distribution of tests by category in question bank (Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

The student receives an individual set of test questions from the test bank (Fig. 9). After testing, the main form displays the number of points scored, the score obtained, the list of questions passed, the correct answers and comments either immediately after the test or after the test is closed (Fig. 10). Thus, the comprehension and consolidation of the educational material continues.

## Банк питань

Виберіть категорію: Module 1 (12)

No tag filters applied

Filter by tags...

Показувати текст питань у списку питань

Параметри пошуку ▾

Показувати питання з підкатегорій

Показувати старі питання (що залишилися у тестах після видалення)

Створити нове питання ...

Питання	Створив	Виправив останнім
	Ім'я / Прізвище / Дата	Ім'я / Прізвище / Дата
<input type="checkbox"/> _____ portrays the "whole person" interacting with his or her environment.	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> A _____ consists of a group of customers who share a similar set of needs and w	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> According to the theory of motivation Maslow first of all the individual wishes to s	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> All marketing strategy is built on STP—segmentation, targeting, and _____.	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> Frederick Herzberg developed a _____ that distinguishes dissatisfiers and satisfie	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> Market positioning is -:	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> Marketing management is _____.	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> One traditional depiction of marketing activities is in terms of the marketing mix o	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> The marketing mix includes _____.	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> The most formal definition of marketing is _____.	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> What is the main thing in determining marketing:	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29
<input type="checkbox"/> Which criterion of segmentation is the formation of a segment by family composi	Вікторія Шумкова 5 жовтень 2019, 7:29	Вікторія Шумкова 5 жовтень 2019, 7:29

Відмічені:

Видалити | Перемістити в >> | Module 1 (12)

Fig. 8. The question bank of the course “Marketing Research and Investment Project Management”

(Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

**Питання 1**  
Відповіді ще не було  
Макс. оцінка до 1,00  
Відмітити питання  
Редагувати питання

\_\_\_\_\_ portrays the "whole person" interacting with his or her environment.

Виберіть одну відповідь:

- 1. Attitude
- 2. Subculture
- 3. Culture
- 4. Lifestyle
- 5. Reference group

**Питання 2**  
Відповіді ще не було  
Макс. оцінка до 1,00  
Відмітити питання  
Редагувати питання

A \_\_\_\_\_ consists of a group of customers who share a similar set of needs and wants.

Виберіть одну відповідь:

- 1. market slice
- 2. market segment market level
- 3. market group
- 4. market target

**Питання 3**  
Відповіді ще не було  
Макс. оцінка до 1,00  
Відмітити питання  
Редагувати питання

According to the theory of motivation Maslow first of all the individual wishes to satisfy:

Виберіть одну відповідь:

- 1. physiological needs:
- 2. the need for love;
- 3. the need for self-development.
- 4. the need for safety;

Fig. 9. Example of a test

(Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

<b>Розпочато</b>	неділя 24 листопад 2019 5:57
<b>Стан</b>	Завершено
<b>Завершено</b>	неділя 24 листопад 2019 6:00
<b>Витрачено часу</b>	3 хв 12 сек
<b>Балів</b>	10,00/12,00
<b>Оцінка</b>	<b>8,33</b> з можливих 10,00 (83%)

Питання **1**  
Неправильно  
Балів 0,00 з 1,00  
Відмітити питання  
Редагувати питання

\_\_\_\_\_ portrays the "whole person" interacting with his or her environment.

Виберіть одну відповідь:

- 1. Attitude
- 2. Subculture
- 3. Culture
- 4. Lifestyle
- 5. Reference group ❌

Правильна відповідь: Lifestyle

Питання **2**  
Правильно  
Балів 1,00 з 1,00  
Відмітити питання  
Редагувати питання

A \_\_\_\_\_ consists of a group of customers who share a similar set of needs and wants.

Виберіть одну відповідь:

- 1. market slice
- 2. market segment market level ✅
- 3. market group
- 4. market target

Fig. 10. Test results  
(Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

The control of students' activities in the system is provided by the Assessment Journal (Fig. 11).

Ім'я / Прізвище		Індивідуальний номер	Marketing research and in... +
			Загальне за курс
Дмитро Авдєєв			50,00
Анастасія Василець			40,00
Віталій Візнюк			80,00
Дмитро Гурешидзе			60,00
Владислав Краснянський			40,00
Вероніка Лесніченко			40,00
Яна Лисенко			80,00
Юлія Луговик			100,00
Мирослава Магденко			70,00
Дарія Максименко			70,00
Олег Мінаєв			40,00
Анастасія Недогібченко			100,00
Єлизавета Пак			90,00
Діана Титаренко			90,00
Андрій Чмир			60,00
Денис Шаповаленко			70,00
<b>Загальне середнє</b>			<b>67,50</b>

Fig. 11. Example of the Assessment Journal  
(Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU)

Therefore, repeated use of the developed tools and automatic verification of results of tasks and testing considerably save time of the teacher. New skills, abilities and experience of students with educational software are acquired.

## 5. Conclusions

Therefore, the online learning system with the use of distance learning elements is continuing its rapid expansion. There is no doubt that distance learning will enter the 21st century as the most effective system of studying continuous support for the high level of qualification of specialists.

The work in an interactive mode will promote the development of:

- communication skills;
- ability to organize the learning environment;
- forming skills for independent activity;
- ability to create situations that encourage knowledge integration to solve the problem.

## 6. References

1. Anysymov A. M. (2009). Rabota v systeme dystantsyonnoho obuchenyia MOODLE [Work in the distance learning system MOODLE]. Kharkov: KhNAHKh. 292 p.
2. Bessalova T.V. (2012). Mozhlyvosti ta perspektyvy rozvytku dystantsiinoi osvity v Ukraini [Opportunities and prospects of development of distance education in Ukraine]. Hileia: naukovi visnyk. Vol.60. pp. 597-600.
3. Zakon Ukrainy «Pro natsionalnu prohramu informatyzatsii». Retrieved from: <http://zakon2.rada.gov.ua/laws/show/74/98-Бп>
4. Kovalynska I.V. (2012). Mozhlyvosti vykorystannia elektronnoho navchalnoho prostoru [Possibilities of using e-learning space]. Retrieved from: [http://www.nbu.gov.ua/portal/soc\\_gum/vchdpu/ped/2012\\_101/koval.pdf](http://www.nbu.gov.ua/portal/soc_gum/vchdpu/ped/2012_101/koval.pdf)
5. Kontsepsiia rozvytku dystantsiinoi osvity v Ukraini. Retrieved from: <http://www.osvita.org.ua/distance/pravo/00.html>
6. Platforma dystantsiinoho navchannia Moodle koledzhu Sumskoho NAU. Retrieved from: <http://moodle.collegesnau.com/course/view.php?id=465>
7. Polozhennia pro dystantsiine navchannia. Retrieved from: <http://zakon2.rada.gov.ua/laws/show/z0464-04>