

USE OF THE SYSTEM MOODLE IN THE FORMATION OF ECOLOGICAL COMPETENCE OF FUTURE ENGINEERS WITH THE USE OF GEOINFORMATION TECHNOLOGIES

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Abstract At present the information and communication technologies in education can be a catalyst in solving important social problems connected with increasing the educational resources and services availability and quality, real and equal opportunities in getting education for citizens despite their residence, social status and income. One of the most important education tasks is to develop students' active cognitive attitude to knowledge. Cognitive activity in universities is a necessary stage in preparing for further professional life. The solution of task of formation of ecological competence of mining profile engineer requires the reasonable selection of the means of information and communication technologies conducting formation of ecological competence. Pressing task is constructive and research approach to preparation of future engineers to performance of professional duties in order to make them capable to develop engineering projects independently and exercise control competently. The relevance of the material covered in the article, due to the need to ensure the effectiveness of the educational process in the preparation of the future Mining Engineers. We analyze the source with problems of formation of ecological competence. The relevance of the material covered in the article, due to the need to ensure the effectiveness of the educational process in the preparation of the future Mining Engineers. The article focuses mainly general-purpose computer system support learning Moodle, which allows you to organize individual and collective work of students to master the specialized course teaching material used in teaching special course "Environmental Geoinformatics" in the implementation of educational research. Used in teaching special course "Environmental Geoinformatics" in the implementation of educational research.

Keywords: ecological competence, geoinformation technologies; future mining engineers.

Introduction. Education must serve for the society needs. Processes reflecting current trends in society provide information technologies development and implementing. At present the ICT usage in education can be a catalyst in solving important social problems connected with increasing the educational resources and services availability and quality, real and equal opportunities in getting education for citizens despite their residence, social status and income [1, 10]. Professionals having common practical and theoretical skills of work with different information types are highly wanted. One of the most important education tasks is to develop students' active cognitive attitude to knowledge. Cognitive activity in universities is a necessary stage in preparing for further professional life. Teacher's task is to seek and find the best methods and means of improving the educational process and leading to the cognitive interest development.

The main regulatory document, defining the legal and organizational principles of Mining Engineers Profile of mining operations, providing emergency protection of mining enterprises, institutions and organizations, is the Mining Law of Ukraine [2].

Due to the fact that, by definition of DeSeCo specialists, environmental sustainability (ecological sustainability) is the basis of the key competences of the individual associated with success in society (The Definition and Selection of Key Competencies), consideration of environmental competency is advantageously carried out at three levels:

– on the general level of ecological culture and environmental awareness Michael K. Stone [3], Alekseev S. V. [4], Gagarin O. V [5], Ermakov D. S.[6];

– on a social-professional level of environmental literacy Zenobia Barlow [7], David W. Orr [8], Galieva G. M. [9] Gurenkova O. V. [10];

– on the special professional level of environmental competence Bazarov E. L. [11], Bibik N. M. [12], Budnik V. F. [13], Carmel Bofinger [14], Harvey B. E. [15].

The use of means of GIS technologies in the formation of ecological competence of future mining engineers takes place in the process of education of the special course "Ecological geoinformatics", that requires their consideration simultaneously as an object of study, and as the means of education. First in theory the special course is reasonable and done "Ecological Geoinformatics".

The primary objective of the special course is forming of the ecological competence through the totality of the special knowledge, abilities and skills, providing possibility to apply means of GIS technologies at first in educational to the students, also in a prospect also in professional activity.

The basic means of the general setting, which is used for teaching of the special course is the computer system of educating support system of educating support Moodle – the freely expandable system of support of educating with a comfortable interface and system of help.

Materials and Methods. In the basis of creation of the special course "Ecological geoinformatics" the principles of use of visual aids, scientific character, individualization and differentiation of educating are fixed in the system of educating support Moodle. The special course in SES Moodle comprises the information is about the special course setting working educational programme the dictionary of basic terms on discipline, methodical instructions on laboratory calculable practical work etc. The material of the SES Moodle special course is structured into two educational modules which include: compendia of lectures on the module subjects glossary; didactic materials to the module subjects reference to the Internet resources; recommended literature; tests.

The main means of the educational communication in the special course by means of SES Moodle are forums, chats and reports. The module "Forum" gives the participants of the special course opportunity to carry out asynchronous communication. SES Moodle contains a few types of forums: standard forum where everybody can begin a new discussion at any time; a forum, where every student can leave one discussion only; or forum of type "questionanswer", where students must at first send the first report, before they will be able to look the reports of other students. A teacher can allow attaching of files to the reports on a forum.

The participants of the discussion can tune influence the receipt of information about the new reports of forum; if necessary to the students, placing of the more than set amount of reports can

be forbidden in a certain period of time. the reports of forum can be appraised by teachers or students.

In the special course forums are used foremost for:

- placing of announcements;
- discussion of maintenance of the special course or additional materials;
- on-line-discussion of problem questions, preliminary the specified audience;
- help in implementation of tasks.

The module "Chat" allows to the participants of synchronous online-discussion in the character mode. A chat can be non-permanent or can recur at the same time every day or week. The sessions of chats are saved and can be done by accessible to all for view.

Chats are especially useful, when a group is unable to meet audience, in next cases:

- the regular meeting of students participating in online-courses, so that they can share the experience with other in the same course, but elsewhere;
- a student temporally can not be present personally on the consultation together with a teacher;
- students gather together, to discuss their experience with each other and with a teacher;
- the session of questions and answers with a teacher who is elsewhere.

Among other external means of educational communication we will distinguish Skype and WizIQ. Skype can be used for organization of the personal text chat, transmission of files, implementation of audio and video rings, realization of conferences. During onlineconsultations Skype is possible to use for the organization of the joint work of the participants of the special course through the possibility of receipt of access to the work mounts of interlocutors.

The module of WizIQ SES Moodle allows to work in the online-classes of WizIQ. Virtual Classroom WizIQ is the on-line instrument of educating, integrated with Moodle and gives a possibility of collaboration in real time and to bilateral connection, creating new possibilities for the synchronous educating within the framework of online-class of Moodle.

WizIQ Virtual Classroom in Moodle allows to cooperate in real-time with the following instruments:

- multilane audio and to 6 videostreams;
- an unlimited amount of participants;
- the presence of general "white board";
- the simple loading of data;
- the sharing of screen.

The module of WizIQ Virtual Classroom gives next means of the integration with Moodle: only entrance in WizIQ and Moodle; the statistics of the use of WizIQ classes; placing of written classes of WizIQ in Moodle; the direct editing of the content of WizIQ classes from within Moodle; general calendar of WizIQ and Moodle.

Results. Using thus special course worked out, students have the opportunity: to choose an arbitrary theme; to look over and load the compendium of lecture on the topic, the maintenance of basic determinations, concepts and facts; to seize educational material and to look over the examples, downloading files from didactic materials; to meet with multimedia (in particular, by a network) resources to the themes of the special course, using the corresponding references; to look over protocols of laboratory works, to pass testing on the chosen topic or on maintenance a few them (in the educational or the supervisory mode); to place in Moodle their individual and collective research projects, own portfolios etc.

Conclusions. Thus, the use of the worked out in SES Moodle electronic educational course allows to organize an individual and collective work of students master educational material of the special course in the process of the implementation of educational researches.

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