


Borys Grinchenko Kyiv University

# **OPEN EDUCATIONAL E-ENVIRONMENT OF MODERN UNIVERSITY**

Collected Scientific Works



Within the framework  
of the international project IRNET

# **ВІДКРИТЕ ОСВІТНЄ Е-СЕРЕДОВИЩЕ СУЧАСНОГО УНІВЕРСИТЕТУ**

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## USE OF CLOUD TECHNOLOGIES AND SOFT SKILLS IN EDUCATIONAL ACTIVITY OF STUDENTS AND TEACHERS

*The use of information and communications technologies in various areas of professional activity is one of the main requirements of modern society. Possibilities of the use of cloud technologies are presented in the article, the concept of "soft skills" is briefly presented. It is analyzed the research "Educause Center for Analysis and Research" on the interest in electronic learning and the use of cloud technologies in it. The review of opportunities of the educational LMS Moodle platform is introduced, the structure of its application is given at Borys Grinchenko Kyiv University as well as the ways of integration of cloudy services into electronic educational environment of the University.*

**Key words:** *ICT, soft skills, cloud technology, university, LMS, Moodle, e-learning.*

### **Challenge problem**

Many countries around the world consider development of main skills and concepts of information and communication technologies as one of the main parts of training of the modern expert, comparing these skills with the skills of reading, writing and counting. But in the conditions of information society development of the educational environment of a modern higher educational institution should not be limited only by the use of computer

equipment, it should be created a new learning environment for students in the classrooms.

### **Analysis of the last researches and publications**

Development of educational environment of university in a century of information technologies demands other set of professional skills for effective communication and interaction in society. The analysis of the last researches and publications [1; 2; 3] shows that studying of problems of electronic training, its introduction in educational institutions and creation of educational environment are studied by Morze N. V., Andrieiev O. O., Kocharian A. B., Bykov V. Yu., Polat Ye. S., Smirnova-Trybulska E. M., Kopochek Remihiush, Villmann Danutata and others.

**The aim of the article** is a detailed examination of the concept “Soft skills”, peculiarities of the use of cloud technologies in educational process and opportunities of their integration into electronic educational environment at higher educational institution.

### **Research methods**

The analysis is carried out on the basis of materials of scientific works of modern researchers in the field of cloud services, Soft skills and electronic educational environments. It is also examined practical application of integration of cloud services into electronic training courses at LMS Moodle platform. During research the following methods were used: the analysis of theoretical sources of the problems of using the Internet — resources in education, studying and synthesis of experience of the organization of independent work of students with the use of information technologies.

### **Research results**

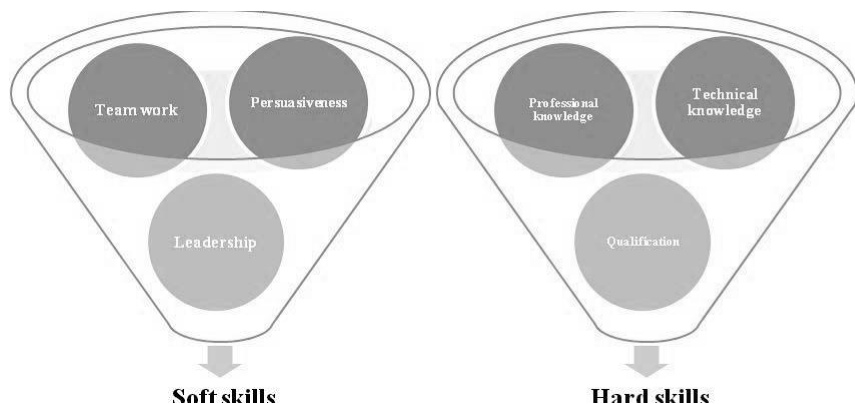
Information and communication technologies gradually change structure of the processes of teaching and training in disciplines, and also add new elements and platforms for training. Therefore the computerization of educational process and the use of online study mode is one of the ways to increase its efficiency. The latest technologies increase flexibility of training, i.e. students may receive the access to knowledge independently of time and geographical barriers. Development of information and communication technologies,

fast access to the latest information in various areas of human activity, as well as opportunity to work collectively on joint projects, despite a geographical arrangement of participants, with the help of innovative technologies improves teaching of educational subjects and academic progress of students. But it is necessary to remember that teachers should not only to present a training material to students in electronic form, but also to adapt it for perception in a new view with the use of Web 2.0 technologies.

Information and communication technologies are force for change of many aspects of our life. The influence of ICT on the following branches of professional activity as medicine, tourism, business, justice, banking, construction and architecture is great. And the application of information and communication technologies today strongly differs from the ways of their use in the past.

Today the percent of graduates of massive open online course (MOOC) is absolutely little, but this project is worth to use it and observe its development. Teachers of universities should realize that students more often choose online training [4].

Introducing ICT into educational process it is necessary to consider characteristics of any technology. They are one of the most important components of education in the 21<sup>st</sup> century. Receiving ability to distinguish Soft & Hard skills are very important element of modern expert's development (*Figure 1*).



*Fig. 1. Soft & Hard skills*

Hard skills or special skills are technical skills connected with activity in a certain area. These skills are steady, foreseeable, easily measured and exposed to decomposition on a number of simple and final operations in accurately established sequence of actions or “by a template”. They are included into the list of requirements stated in duty regulations.

Soft skills or universal skills allow to be successful regardless of specifics of activity and the direction in which the person works.

Traditionally they are carried to number of social skills:

- ability to persuade and be the leader;
- ability to reach out to people;
- negotiating;
- team work;
- personal development;
- time management skill;
- comprehensive knowledge and creativity, etc.

It is difficult to trace, check and visually to show the extent of development of skills on the category Soft skills. Effective development of skills on this category is always directed on development of ability to see and distinguish plurality of options of this or that situation.

The main distinctions between Soft and Hard skills are presented in the table (*Table 1*).

*Table 1*

Characteristics	Soft Skills	Hard Skills
<b>Basis</b>	Competence	Skill sets
	Professional experience	Personal values
<b>In response to certain actions are applied</b>	Technical knowledge, qualification	Behavior pattern
<b>Criticism</b>	Critical in the short term	Critical in long-term behavior
<b>Development</b>	Development happens faster	Development happens slower



Characteristics	Soft Skills	Hard Skills
<b>Result</b>	With smaller efforts and guaranteed result (at observance of basic criteria: motivation, ability to training, etc.)	With great difficulty, achievements of the necessary level are not guaranteed (limit of competences, deep integration in structure of the personality)

Soft skills may be divided into 4 groups. All these skills are necessary for teachers and specialists of IT branch [5] (*Table 2*).

The operating time of soft skills is the objective requirement of labor market. For successful formation of ability to apply these skills in working situations it is necessary to practice constantly as they have a tendency to the regression. Soft skills not only supplement hard skills and create new opportunities, they also have a beneficial effect on development and formation of professionalism.

One more of the innovations in educational process used in the modern world are cloud services. According to developed foreign countries' experience [6; 7; 8], introduction "cloud computing" in educational process is the excellent solution of problems of a computerization of education.

"Cloud technologies" are technologies which provide to the Internet users access to computer resources of the server and the use of software as an online service.

The term "cloud" in this case is used as a metaphor, a certain image which hides for itself all difficult technical details which the ordinary user does not need to know. The English language term "cloud computing" for the first time was used in 1993 by Eric Schmidt for designation of services, remotely support various data and applications placed on remote servers. In two decades cloud technologies completely won information space. In the sphere of network technologies this phrase is a symbol of today's time. The graphic prototype of the term is obliged by the appearance of diagrams and other illustrations in the form of clouds by means of which it is accepted to represent the Internet.

Table 2

1 group	2 group	3 group	4 group
Personal Performance	Management Skills	Communication Skills	Strategic Skills
Ability to put and achieve goals	Ability to manage a team	Ability to work in a team	Strategic planning
Time management	Ability to form a team	Ability to carry out effective communication	Acceptance of strategic decisions
Stress resistance	Ability to form system of communications in team	Interpersonal communication	Ability to work in the conditions of risk
Sense of responsibility	Ability to motivate participants of team	Solution of conflict situations	Ability to delegate powers
Creativity	Development of leader properties	Conducting negotiations	
Analytical thinking	Formal and informal management	Persuasiveness	
Conducting presentations		Making team decisions	

Only two things are necessary for the user for work with cloud services: stable connection to the Internet and browser. The main feature of cloud services also consists in it.

Modern network services provide with the following opportunities for creation of various educational situations in which students can master and work out skills necessary in 21<sup>st</sup> century:

- *information literacy* — the ability to look for information, to compare it from different sources, to distinguish and choose the most important;
- *multimedia literacy* — the ability to distinguish and use various media resources both in work and in training;
- *organizational literacy* — the ability to manage your time to do everything in time that is planned;
- understanding interrelations between various people, groups and organizations;
- *communicative literacy* — the skills of effective communication and cooperation;
- *productive literacy* — the ability to create qualitative products, possibility to use the means of planning.

Special place in the context of informatization of the higher educational institution receives e-Learning that is beyond only educational activity of teachers and students. E-Learning provides more easy and fast access for students to training materials: lectures, practice, laboratory and independent works.

Higher educational institutions widely use internal learning management systems (LMS) for creation of educational environment moving to “clouds” all the training materials for students for easy and fast access to them from any point of the world, the only necessary thing is the access to the Internet.

The research ECAR (Educause Center for Analysis and Research) shows that the majority of universities of the world are interested in electronic training and the use of cloud technologies in it [9] (*Figure 2*).

E-Learning provides more easy and fast access for students to training materials: lectures, practical, laboratory and independent works.

The main goal of internal learning management systems is the increase of level and quality of methodical, didactic, information support of the educational process for students, teachers and administrative staff.

LMS provides:

- involvement of students in active educational process;
- creation of conditions for active interaction of students and teachers;

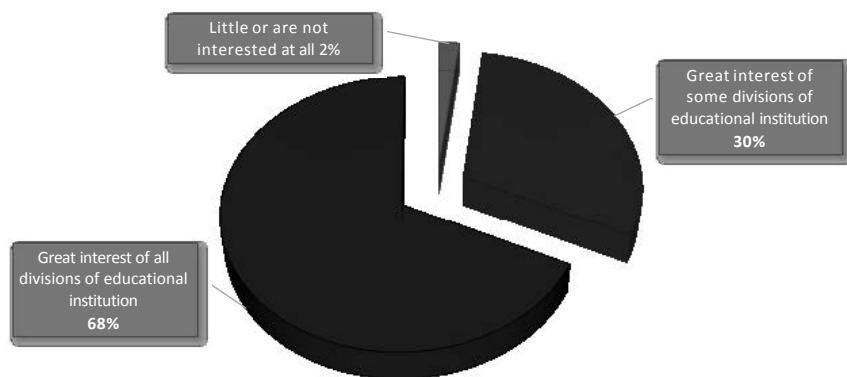


Fig. 2. The research ECAR about the interest in electronic training of divisions of the university

- maintaining webpage of discipline and supporting study of students by hanging material to them for acquaintance / studying, collecting students' works and their discussion, testing students' knowledge, sending announcements, maintaining a calendar of educational process;

- creation a virtual student (for viewing and approbation of the content of discipline by the student's "eyes") by every teacher at registration.

The most successful and used for needs of university is the educational Moodle platform. It is a management system of site content, especially developed for creation of educational online courses. "Moodle" means "Modular Object-Oriented Dynamic Learning Environment". The basis of the program is modular structure. There are a lot of additional modules which realize different functions. It can be the module of poll, task, test, lecture, etc. Moodle operates on all computers where it is possible to establish PHP and to start MySQL or PostgreSQL database. Web site Moodle free of charge provides to users of a platform high-quality support. It is promoted by the numerous communities.

The learning management system Moodle belongs to freely distributed software. "Openness" of the program gives the chance to adjust system under features of concrete educational institution, on the inclusion or exclusion of this or that element possibly proceeding from the current, urgent or long-term educational requirements of a certain group

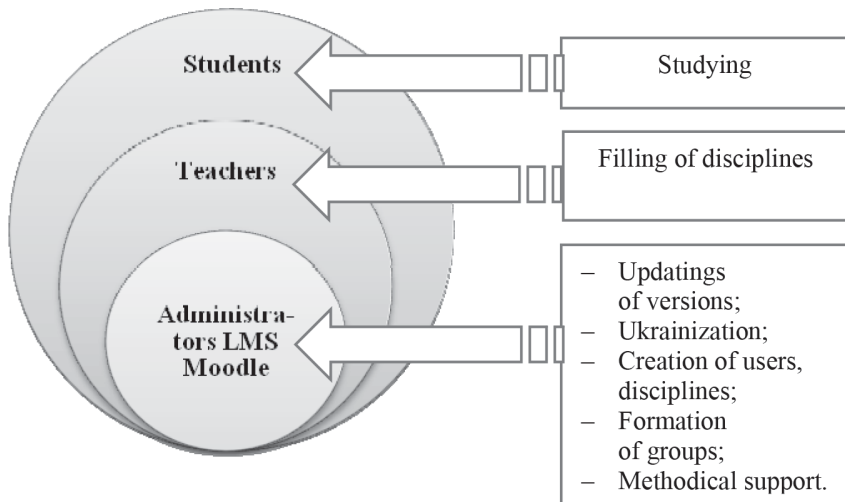


Fig. 3. Structure of application of LMS Moodle platform at BGKU

of students in certain time, and also to build new modules in it. Besides the author of electronic training courses (ETC) created on the LMS Moodle platform may integrate all necessary for a course, using a full range of its integrated functions including external general tools: forums, chats and blogs.

ETC has the following structure at Borys Grinchenko Kyiv University (BGKU): general information about a course, a statement of theoretical data, practical (laboratory), independent works, testing the acquired knowledge by means of e-tests. Also the relevant structure of application of LMS Moodle in higher educational institutions is developing (Figure 3).

The main points of a subject issues are given in general information about the course. It is also attached work, thematic plans, criteria of an assessment, published and Internet sources, glossary, map and presentation of the course.

Theoretical training material in ETC is presented by means of the structural Moodle elements: page, lecture, inscription, etc.

– By the means of the structural element “Page” the web page is created on the basis of the built-in text editor. Texts, pictures, sound, videos,

links and the built-in elements (Google maps, Youtube) can be placed on the page.

- The structural element “Lecture” allows to bring important information in the traditional form of youth and to check how well the materials are acquired. It is possible to use “Lecture” for creation of a set of single-level web pages, the training structured visual material with easy to read navigation and test tasks for self-control.

- “Inscription” is an insert of inscriptions on the page of a course, the link to other resources and kinds of activity; serves optimization of understanding of structure of ETC.

For the organization of tasks for practical (laboratory), independent works of students in Moodle the structural element “Task” is used. It is possible to create problems of several types, to collect works, to estimate them and to write responses. Students can send any digital content (files), for example: documents of a text editor, spreadsheets, images, audio and videoclips. As an alternative or additions of a task it is possible to assume input directly in the built-in text editor. The task can be also used for exposure of an assessment of oral answer, drawing, or other product which they have to hand personally, not in a digital form. At task checking it is possible to leave comments for feedback. Final grades are put in register.

Structural elements “Forums” and “Chat” are also used. By means of a chat it is possible to organize live discussion for maintenance of practical or laboratory lecture. By means of “Forum” element it can be arranged integrated practical work, including the submission of an essay on the proposed theme and commenting on essays by classmates. It can be also organized discussion on the theme set by the teacher as well as created the news forum containing the message from the teacher for students.

E-teststing of students is used to test the acquired knowledge in course. Moodle allows to develop tests with tasks of various types: a multiple choice, compliance, short answer, numerical, etc. and to provide personal versions of tests. It is possible to configure the number of attempts to pass the test, stirring or questions may be selected at random from a bank of questions. Also restriction of time can be set. Each attempt is estimated by Moodle system automatically, excluding essay questions which should be checked independently. Test tasks can be used for examination, current modular control, for receiving feedback, for an assessment of learning efficiency, self-assessment.

Electronic educational Moodle platform is focused on the organization of interaction between the teacher and students in internal and distance form of education. LMS Moodle helps with the solution of the following tasks:

- The teacher pays less attention on published material which listeners have to gain, and the subsequent giving marks.
- The teacher from simple “source of knowledge” turns into the inspirer, the role model of culture of educational group, communicating with students individually and working with their personal needs, at the same time directing the discussions and activities of the entire group to achieve common learning goals.

The author of electronic training courses created on LMS Moodle platform can integrate educational and methodical materials for a course, using a full range of its integrated functions, including external general tools: forums, chats and blogs.

There are such options of integration of cloud services in electronic educational LMS Moodle environment:

- by means of hyperlinks;
- by means of HTML code for embedding in ETC.

Integration of cloud services by means of a hyperlink is the simplest option of integration into ETC. For access according to the link it is necessary to establish access level according to the link: “On: anyone who has the link can access” and which of its types is provided to students: “Editing”, “Commenting”, “Viewing”.

Teachers use tasks with hyperlinks for the organization of collaboration of students (in particular, to fill in the table, or to find information, to create presentation, or to choose a subject of the individual and research task).

Integration of cloud services by means of code HTML for embedding is used when it is necessary to build in ETC presentation or any other document without possibility of editing. For integration of the file into electronic educational LMS Moodle environment it is necessary to copy HTML code of the file and to add it to the ETC.

The most used integration example in electronic educational LMS Moodle environment is video from Youtube. To display it at the course it is necessary, as in the previous case, to copy HTML code of video and add it to ETC page. Before copying HTML code from Youtube it is possible to choose still additional setting of video for the best display in ETC. Integrating video to own ETC it is necessary to remember copyright [10].

## Conclusions

Alternative educational technologies cause the appearance of new requirements to competences of teachers, changes of their usual methods of teaching material, new organization of training with the use of modern management facilities of educational process, new approaches to educational statistics, formation of training programs and assessment methods. The successful combination of cloud technologies and possession of soft skills by teacher creates opportunities for personal training, interactive activities and collective teaching, reduces costs of acquiring the necessary software, and improves the quality and efficiency of education and development of professional skills. The use of electronic educational Moodle environment allows to keep an individual approach to educational process and to organize group activity of students by means of chats, forums and other communicative components of the system. Continuous use of new means for training gives the opportunity to develop, accustoms to new style of behavior, solving any problems easily. Such training helps to make educational process opened and available for everybody. At the same time it is necessary to notice that similar systems have to be added with third-party services for visualization of data, creation and performance of tasks, collaboration, such as Google Apps for Education, etc. It is also necessary to focus teachers' attention not only on supplying educational content in electronic form but on its adaptation to the new form of perception, and the reformulation of problems with the use of technology Web 2.0-3.0.

## REFERENCES

1. Morze, N. V. (2011). Pedagogical Aspects of Using Cloud Computing [Online] / N. V. Morze, O. H. Kuzminska // *IKT v osviti, doslidzhenniakh ta industrialnykh dodatkakh: intehratsiia, harmonizatsiia ta transfer znan.* — 2011. — № 9. — p. 20–29 (in Ukrainian).  
[http://ite.kspu.edu/webfm\\_send/200](http://ite.kspu.edu/webfm_send/200)
2. Bykov, V. Yu. (2011). Cloud Computing Technology – the Leading Information Technology for Further Development of Information Systems Education in Ukraine [Online] / V. Yu. Bykov // *Kompiuter u shkoli ta simii.* — 2011. — № 6. — p. 3–11 (in Ukrainian).  
[http://lib.iitta.gov.ua/1173/1/Tehnolohiyi\\_hmarnyh\\_obchyslen\\_-\\_providni\\_informatsiyni\\_technology.pdf](http://lib.iitta.gov.ua/1173/1/Tehnolohiyi_hmarnyh_obchyslen_-_providni_informatsiyni_technology.pdf)



3. Patarakyn, Ye. D. (2009). Social Interaction and Online Learning 2.0 / Ye. D. Patarakyn // M. : NP «*Sovremennye tehnologii v obrazovanii i kulture*».- 2009. — 176 p. (in Russian).
4. Popova M.V. ICT in the Development of Intercultural Competence [Online]. / M. V. Popova // Pyatigorskiy gosudarstvennyi lingvisticheskiy universitet. — 2009 (in Russian).  
[http://pglu.ru/upload/iblock/7b2/uch\\_2009\\_xii\\_00053.pdf](http://pglu.ru/upload/iblock/7b2/uch_2009_xii_00053.pdf)
5. Koval, K. O. (2015). Development of “Soft Skills” among Students as one of the Important Factors of Employment [Online] / K. O. Koval // *Visnyk Vinnytskoho politekhnichnoho instytutu*. — 2015. — № 2. — p. 162–167 (in Ukrainian).  
<http://visnyk.vntu.edu.ua/article/view/3969/5731>
6. Khmelevskiy, Y. (2010). Cloud Computing Infrastructure Prototype for University Education and Research / Y. Khmelevskiy, V. Voitenko // *WCCCE'10 Proceedings of the 15<sup>th</sup> Western Canadian Conference on Computing Education*. — ACM New York. — 2010. — № 8. — 5 p.
7. Lohr, S. (2007). Google and I.B.M. Join in ‘Cloud Computing’ Research [Online] / S. Lohr // *New York Times*. — 2007.  
<http://www.nytimes.com/2007/10/08/technology/08cloud.html>
8. Mell, P. (2009). Effectively and Securely Using the Cloud Computing Paradigm [Online] / P. Mell, T. Grance // National Institute of Standards and Technology, Information Technology Laboratory. — 2009.  
[http://csrc.nist.gov/organizations/fissea/2009-conference/presentations/fissea09-pmell-day3\\_cloud-computing.pdf](http://csrc.nist.gov/organizations/fissea/2009-conference/presentations/fissea09-pmell-day3_cloud-computing.pdf)
9. Bichsel, J. (2013). The State of E-Learning in Higher Education: An Eye toward Growth and Increased Access [Online] / J. Bichsel // *EDUCAUSE Center for Analysis and Research*. — 2013.  
<http://net.educause.edu/ir/library/pdf/ers1304/ERS1304.pdf>
10. Tiutiunnyk, A. V., Honcharenko, T. O. (2014). Using Cloud Services to Create the Education Environment of Teachers and Students [Online] / A. V. Tiutiunnyk, T. O. Honcharenko // *Osvitohichnyi Dyskurs*. — 2014. — № 1 (5). — p. 227– 241 (in Ukrainian).  
<http://od.kubg.edu.ua/index.php/journal/article/view/81/102#.VgwpL5f0dHM>