

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Moodle As A Way To Develop Information-Communicative Competence In Medical Educators.

Irina Y Plotnikova*, Alexandr A Filozop, Svetlana Y Berleva, and Larisa S Bakulina.

Voronezh N N Burdenko State Medical University.

ABSTRACT

In the XXIst information-communicative (IC) competence of teachers in higher education is becoming a must of their professional competence. Implementation of Federal State Educational Standard of Higher Education, medical profile, new version, and professional standard "Instructor of Professional Learning, Education and Supplementary Professional Education" in 2017 conditioned the necessity to determine a new model of developing IC competence in teachers of medical universities. *The aim of study* was to study the process of developing IC competence in lecturers of Voronezh N.N. Burdenko State Medical University (University) in the Moodle setting at the stage of supplementary professional education. The study included 475 lecturers of University taking "Basics of e-learning and distant learning technologies in medical university" course (72 hours/ 2 credits) and monitored their IC competence (2013-2017). The results of the study demonstrated that application of Moodle and other modern ICT gives new potentials of development for health professionals working in the system of healthcare and medical education in Russia.

Keywords: information-communicative (IC) competence; information-communicative technologies (ICT); a lecturer of medical university; modular object-oriented dynamic learning environment (Moodle); professional standard; supplementary professional education.

**Corresponding author*

INTRODUCTION

Active development of scientific knowledge, information-communicative technologies (ICT) and informational support of education are reported to be the leading tendencies of social development in the XXIst century influencing all spheres of life and activity of a modern human being [1]. Analysis of current international standards of teachers' informational and communicative competences (ISTE Standards Teachers, European e-Competence Framework 3.0 and others) [2, 3, 4] allows arguing that IC competence of modern teachers in high education is an integral professional characteristic reflecting ICT application in education for solution of a wide range of professional challenges, simulation and educational environment design. It also develops an ability to apply ICT in the future professional activity in students. ICT implementation in the professional activity of higher educational teaching staff, including those of medical profile, appears to be a priority in modernization of education in Russia. This is determined by implementation of new professional standard "Instructor of Professional Learning, Education and Supplementary Professional Education" [5]. However, in the Russian Federation there are no state educational standards and a uniform system of supplementary professional education in the ICT area, which are essential to develop knowledge and skills included in the new professional standard of an educator, for teachers of medical universities.

The abovementioned problem determined the *aim of our research* - to study the efficiency of the IC competence development in lecturers of the Voronezh N.N. Burdenko State Medical University (University) in the Moodle setting at the stage of supplementary professional education.

MATERIALS AND METHODS

The study is based on the four-year monitoring of IC competence development in lecturers of Voronezh N.N. Burdenko State Medical University taking supplementary professional course in "Basics of e-learning and distant learning technologies in medical university" program (the Program) (72 academic hours/ 2 credit points). The authors of the course are Irina Y. Plotnikova, Candidate of Pedagogical Sciences, Assistant Professor, and Alexandr A. Filozop, Candidate of Psychological Sciences, Assistant Professor.

Combined requirements to professional skills of higher educational instructors in the ICT area included into the professional standard "Instructor of Professional Learning, Education and Supplementary Professional Education" were reported to be the basic criteria of IC competence [6, p.62]: "to apply technical training aids and educational technologies, including e-learning; to use distant educational technologies, information communicative technologies, educational and informational e-resources considering specificity of specialist programs", supplementary professional programs, Federal State Educational Standards of Higher Education (FSES HE) (for programs of HE), medical profile, specificity of the teaching discipline/ module and teaching objectives of the unit (module), type of the unit. (*authors' translation*)

As it had been estimated in the plan of continuing professional education for the University teaching staff, 475 medical educators were trained on the Program in 2013-2017. Residents of the Program were divided into groups randomly. Prior to learning all residents of the Program had a sufficient level of "computer literacy", i.e. understanding of a personal computer; basic skills and knowledge to create e-documents and perform simple operations using tools from the basic package of office programs, such as Microsoft Office (text, presentation, tables, and others); knowledge about systems of data transfer (local and global nets, theme-based internet resources) [7].

99.9% of residents of the Program demonstrated lack of professional knowledge of didactic potential and algorithms of ICT application, e-learning, distant educational technologies, educational and information e-resources in the educational activity with medical students as well as an ability to carry out e-learning, apply distant educational technologies and ICT, educational and information e-resources considering specificity of educational programs, FSES HE (medical profile).

Educational training on the Program was performed in the Moodle setting; it is a component of electronic information-educational environment (EIEE) of the University.

Basic points and benefits of Moodle in comparison with the other distant systems of education have been discussed in many publications [8, 9, 10, 11]. It is important to indicate here five basic principles of

Moodle defined by Martin Dougiamas (an ideologist and leader of the project aimed to design Moodle - the system of education management). He united these principles under the term “social constructivism”. Ideas of social constructivism appear to be the philosophical and methodological platform for structuring educational process in the distant learning environment Moodle [12]:

- 1) We are all potential teachers as well as learners;
- 2) We learn well by creating and expressing for others;
- 3) We learn a lot by watching others;
- 4) Understanding others transforms us;
- 5) We learn well when the learning environment is flexible and adaptable to suit our needs.

The Program consists of two modules:

Module 1 (1 credit point): “*Methodology of the development of electronic learning and teaching package in a discipline/module*”. The aim of this academic module is to obtain knowledge and develop skills and abilities (professional competences) necessary for a medical educator to design an electronic learning and teaching package in a discipline/ module with application of actual digital technologies to deliver learning materials and also to provide communication between teachers and students in the networking environment [13].

Module 2 (1 credit point): “*Management of educational process in the distant learning environment Moodle*”. The aim of this academic module is to obtain knowledge and develop skills and abilities (professional competences) necessary to manage educational process in a discipline/ module in the distant learning environment Moodle.

During the whole period of training residents of the Program had an opportunity to experience individual on-line consultations with their tutors. This provided prevention of a sense of isolation and lack of support from outside – feelings that may appear in asynchronous model of learning in residents taking distant academic courses [14].

Final assessment on the Program included the following items:

- 1) *testing* (60 test cases) – to assess quality of theoretical knowledge obtained by the residents;
- 2) creation of an electronic learning and teaching package in a discipline/module, medical profile, developed in the Moodle setting on the portal of Electronic and distant learning of the Voronezh N.N. Burdenko State Medical University [15] – to assess practical skills and abilities of the residents of the Program developed during their training.

Monitoring of the IC competence development in the teaching staff of the University was based on the following technologies:

- 1) *questionnaire survey* of the residents of the Program after completion of their training aimed to investigate the attitude of the residents towards educational process in the Moodle setting (COLLES - Constructivist On-line Learning Environment Survey) [16].

COLLES consists of 24 statements grouped into six scales; each of them helps to answer the key question about quality of the learning environment Moodle (Table 1):

Table 1: Structure of the COLLES

<i>Relevance</i>	How relevant is on-line learning to students' professional practices?
<i>Reflection</i>	Does on-line learning stimulate students' critical reflective thinking?
<i>Interactivity</i>	To what extent are students engaged in the on-line productive educative dialogue?
<i>TutorSupport</i>	How well do tutors enable students to participate in on-line learning?
<i>PeerSupport</i>	Is support provided on-line by fellow students sensitive and encouraging?
<i>Interpretation</i>	Do students and tutors make good sense of mutual on-line communications?

- 2) *current monitoring* of the professional IC competence development in the teaching staff of the University resulted from the training on the program. Independently developed electronic learning and teaching packages in a teaching discipline/module created in the Moodle setting of the University and their realization in the educational process of medical specialists training at present time were determined as analysis criteria (Table 2).

Table 2: Criteria of the analysis of an electronic learning and teaching package in a teaching discipline/module

<i>Criterion</i>	<i>Description</i>
Identity	Compliance of the structure and content of an electronic and teaching package with the academic curriculum of a discipline/ module
Feasibility	Substantiation of the necessity of IT use, logic reasoning for choosing tools in the Moodle
Integrity	Integrated use of educational and IT
Practical significance	Compliance of an electronic and teaching package with needs of an educational institution, age peculiarities of students, and potential of its application in the real educational process
Functionality	Use of an electronic learning and teaching package in a teaching discipline/module to manage all types of students' learning activity
Design	Formatting of text, graphic and other materials (colour, brightness, size etc.), a number of elements at one page (illustrations, text explanations and so on) in accordance with psychology-pedagogical requirements specified for e-learning
Application	Implementation of an electronic learning and teaching package in a teaching discipline/module in the educational process

IC competence was assessed based on four levels of development:

1 – *unsatisfied level of IC competence*: an educator does not have knowledge and skills necessary to manage the educational process with IT support; an educator does not understand importance of IT for modern educational system; an educator does not have motivation to develop IT knowledge and skills;

2 – *insufficient level of IC competence*: an educator has unsystemized knowledge, partially developed skills and abilities composing IC competence; an educator tends to experience these knowledge, skills and abilities in his professional activity but makes mistakes; an educator understands importance of IT for modern educational system and is able to further learning;

3 – *basic level of IC competence* (necessary and sufficient for IT use in the professional activity): an educator has knowledge and skills necessary to manage educational process with IT application in compliance with requirements of the professional standard; an educator has motivation and ability to professionally develop IC competence;

4 – *expert level of IC competence*: an educator has IT knowledge and skills at the level that meets international standards of IC competence of a teacher/ lecturer; an educator experiences creative approach in his professional activity; an educator is able to consult colleagues on issues of IT use in the educational process; an educator reveals high motivation to continuing professional development of IC competence.

RESULTS

Results of COLLES survey are given in Table 3. They include data on 475 residents of the Program being trained in the period from January 2013 to December 2017.

Table 3: COLLES survey results

Scale	Almost never	Rarely	Occasionally	Frequently	Almost always
Relevance	0%	5,3%	11%	73,7%	10%
Reflection	0,5%	4,8%	32,6%	62,1%	0%
Interactivity	0%	0,4%	1,7%	74,3%	23,6%
TutorSupport	0%	0%	0,7%	39,8%	53,5%
PeerSupport	0%	0%	25,3%	74,7%	0%
Interpretation	0%	0%	0%	36,4%	63,6%

- 1) The teaching staff of the University trained on the Program understands significance of IT use at the stage of supplementary professional education;
- 2) Most of the respondents agree with the statement that the educational environment Moodle stimulates critical thinking development; one-third of the respondents believe that this is determined by certain learning situations;
- 3) All residents realized themselves as being actively involved in the interactive educational dialogue during their training on the Program;
- 4) Almost always/frequently residents of the Program were given tutors' support;
- 5) Most of the respondents agreed with the fact that there existed mutual peer-support between residents of the Program;
- 6) All residents of the Program agreed with the statement that almost always/ frequently they met understanding in both interactive systems - "student-tutor" and "student-student".

Results of the analysis of an electronic learning and teaching package in a teaching discipline/module designed by a resident of the Program are given in Table 4.

Table 4: Results of the analysis of an electronic learning and teaching package in a teaching discipline/module

Assessment parameter	Levels of IC competence			
	unsatisfied	insufficient	basic	expert
Identity	0%	3,2%	96,8%	0%
Feasibility	0%	25,9%	74,1%	0%
Integrity	0,6%	36,7%	62,7%	1%
Practical significance	0,4%	11%	88,6%	0%
Functionality	0%	16,6%	83,4%	1,4 %
Design	1,8%	20,7%	77,5%	0%
Application	0%	27,2%	72,8%	0%
Average value of the assessment parameters	0,4%	20,1%	79,4%	0,3%

Conclusions on Table 4: the analysis of electronic learning and teaching packages in a teaching discipline/module designed by the teaching staff of the University-residents of the Program has showed that basic level of IC competence prevails in all assessment parameters; this fact gives evidence of professional abilities in the IT area included in the professional standard "Instructor of Professional Learning, Education and Supplementary Professional Education". However, presence of the insufficient level of IC competence in the teaching staff of the University – residents of the Program needs further research to determine factors negatively influencing IC competence development in the distant learning environment Moodle.

CONCLUSION

Informational support of education is reported to be a global tendency of the modern age. Since 90s of the XXth century various aspects of the information and education space development have become the purpose of research studies in education. For example, at that period some researchers (S.V. Bogdanov, A.Y. Vagramenko, L.N. Gorbunova, A.M. Semibratov and others) studied potentials of informational interaction

between educational professionals in the virtual environment; others (A.A. Afonin, M.G. Kreys etc.) developed and put into practice models of search for scientific-educational information in the internet [17]. At the beginning of the new century Government of the Russian Federation set a challenge to transfer the education at the principally new level that will meet requirements of highly-developed postindustrial society. However, two-decade permanent reformation of the educational system of our country has not solved the problem of creating the effective system aimed at the IC competence development in the teaching staff of higher educational institutions. In coordination of state and non-state programs of the teaching specialists training in the IT area, disregard of international standards in the area of digital technologies for developing the efficient system of the university academic staff advanced training in the system of continuing professional education – these problems still remain acute nowadays.

Implementation of the FSES HE, new version, medical profile, and enactment of the new professional standard “Instructor of Professional Learning, Education and Supplementary Professional Education” in 2017 demanded creation of the new model of professional and IC competence development in teaching staff of medical universities.

This study supported the efficiency of the basic level IC competence development in the teaching staff of the medical University in the Moodle setting at the stage of supplementary professional education. Use of modern IT and Moodle in the system of supplementary professional education of medical workers and medical educators gives new potentials for further professional development of specialists working in the system of healthcare and in the system of medical education [18]. This, in turns, encourages development of the system of continuing professional education in the Russian Federation and its integration into the global educational environment.

“Imagine a school with children that can read or write, but with teachers who cannot, and you have a metaphor of the Information Age in which we live.” (Peter Cochrane, co-founder of Concept Labs CA, researcher in the informational technologies area).

REFERENCES

- [1] Soroko N.V. Modern strategies of development of information-communicative competence in teachers in the context of the global computer-oriented environment. *Mezhdunarodnyy elektronnyy zhurnal "Obrazovatel'nye tekhnologii i obshchestvo"* [International e-journal Educational Technology & Society], 2013, Vol.16, №1, pp. 699-737. (In Russian)
- [2] ISTE Standards. Teachers. International Society for Technology in Education, 2008 [Internet]. Available from: URLhttps://www.iste.org/docs/pdfs/20-14_ISTE_Standards-T_PDF.pdf (cited: 2016 December 23).
- [3] European e-Competence Framework 3.0 A common European Framework for ICT Professionals in all industry sectors. CWA 16234:2014. Part 1 [Internet]. Available from: URL: http://ecompetences.eu/wpcontent/uploads/2014/02/European-e-Competence-Framework-3.0_CEN_CWA_16234-1_2014.pdf (cited: 2016 December 21).
- [4] Education Queensland. Minimum Standards for Teachers-Learning Technology. 1999 [Internet]. Available from: URL: <http://education.qld.gov.au> (cited: 2016 December 23).
- [5] Titova S.V., Samoylenko O.Y. Structure of the information-communicative competence of teaching staff in universities. *Vestnik Tambovskogo universiteta. Seriya Gumanitarnye nauki* [Reporter of Tambov university. Humanitarian discipline], Tambov, 2017, Vol. 22, issue 3 (167), pp. 39-48. DOI: 10.20310/1810-0201-2017-22-3(167)-39-48. (In Russian)
- [6] Order of the Ministry of Health and Social Development of the Russian Federation of September 8, 2015 № 608н «On approval of the professional standard Instructor of Professional Learning, Education and Supplementary Professional Education» [Internet]. Available from URL: http://synergy.ru/aspir/general/upload/new_IY/Приказ%20Минтруда%20России%20от%2008.09.2015%20№%20608н%20Об%20утверждении%20профессионального%20стандарта%20 (cited: 2017 December 12).
- [7] Moiseeva M.V. *Razvitie professional'noy kompetentnosti v oblasti IKT* [Development of the professional competence in the IT area]. M.: Izd. dom «Obuchenie Servis», 2008, 256 p. (In Russian)

- [8] Dougiamas, M. A, Moodle: Using Learning Communities to Create an Open Source Course Management System. 2003 [Internet]. Available from: URL: <https://dougiamas.com/archives/edmedia2003/>, (cited: 2017December 12).
- [9] Philosophy of Moodle, Moodle: open-source community-based tools for learning. 2011 [Internet]. Available from: URL: <http://docs.moodle.org/21/en/Philosophy> (cited 2017 December 12).
- [10] Pedagogy of Moodle, Moodle: open-source community-based tools for learning. 2011 [Internet]. Available from: URL: <http://docs.moodle.org/21/en/Pedagogy> (cited: 2017 December 12).
- [11] Using Moodle, Second Edition by Jason Cole and Helen Foster Copyright © 2008 O'Reilly Media [Internet]. Available from: URL: <https://doc.lagout.org/Others/O%27Reilly%20Using%20Moodle%20%282nd%20Edition%29.pdf> (cited: 2017 December 12).
- [12] Logvinova A.V. Benefits of the system of distant learning Moodle in the context of foreign language learning for technical students. *Vestnik nauki Sibiri* [Siberian Journal of Science], 2011, № 1 (1), pp. 359-362 (In Russian)
- [13] Statute on an electronic learning and teaching package in a teaching discipline (module) of the Voronezh N.N. Burdenko State Medical University [Internet]. Available from: URL: <http://vrngmu.ru/upload/iblock/36b/36bd9d8fd706cd0f3f0eb6cc8c3b73a3.pdf> (cited: 2017 December 12).
- [14] Mikhaylova, N.V. Peculiarities of the asynchronous learning of university students in the e-environment. *Vestnik Orenburgskogo gosudarstvennogo universiteta* [Orenburg State University Journal], 2012, pp.149-154 (In Russian)
- [15] Electron and distant learning of the Voronezh N.N. Burdenko State Medical University [Internet]. Available from: URL: <http://moodle.vsmaburdenko.ru/> (accessed: 2017 December 12).
- [16] Peter Charles Taylor and Dorit Maor. The Constructivist On-Line Learning Environment Survey (COLLES) [Internet]. Available from: URL: <https://surveylearning.moodle.com/colles/> (cited: 2017 December 12)
- [17] Khomeriki O.G. Information Support of Innovative Processes in Education: Organization`s Experience and Tendencies of Development // *European Journal of Contemporary Education*, 2015, Vol. (11), Is. 1: 38-51
- [18] Plotnikova I.E., Komova S.Y., Brezhnev S.I. Distant educational technologies in the system of continuing professional education. *Global'nyy nauchnyy potentsial* [Global Scientific Potential], 2014, №6 (39), pp. 24-27. (In Russian)