

## Conference Paper

# Implementation and Assessment of a Blended Learning Environment in Postgraduate Education

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## Abstract

The article is devoted to the description of information technology (IT) tools in teaching foreign languages to PhD students in a digital environment. The authors describe the methodological basis for designing an assessment system that is relevant to the specific character of digital education, clarify the main functions of new assessment tools and determine the peculiarities of this activity in connection with information technology. The article deals with explaining the use of IT tools with an emphasis on the study of the educational content of the student and the development of personal soft skills. The results include monitoring the performance achieved in the learning process, authors' observations and research based on post graduates' outcomes and aimed at monitoring the development of their own perspective. The findings were confirmed by prognostic simulation and experimental learning. According to the authors, the use of information technology tools, as well as technology-based assessment, is based on principles which tend to challenge traditional learning and teaching practices and, thus, affect education policies and systems. On the other hand, piloting this technology has outlined a promising range of problems that need to be addressed in further research related to higher education.

**Keywords:** digital environment, technology-based assessment, blended learning, a postgraduate course, soft skills, professional development

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Received: 13 January 2020

Accepted: 22 January 2020

Published: 30 January 2020

Publishing services provided by  
Knowledge E

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Selection and Peer-review under the responsibility of the 4th CTPE 2019 Conference Committee.

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## 1. Introduction

Nowadays the increase of cross-cultural communication caused the growth of the number of collaborations in the digital educational environment of universities. The subject matter of cooperative study deals with environmental topics, construction and engineering. Siberian Federal University (SibFU) is known for its scientific and industrial projects, such as portable luminometers, polymers of wide application, universal sorbents, a road printer, water biotesting, dynamic object examination, etc. Future scientists participate in international and all-Russian conferences and programs of academic

mobility, discuss and publish the results of their scientific research not only in Russian journals but also in journals indexed in Scopus and Web of Science.

In connection with this, the modern higher school faces a difficult task: to create conditions for the future specialist of a non-language profile for successful educational and professional activities in terms of digital educational environment. This point of view is supported by other scientists who believe that a modern university must train professionals who, apart from having a high special competence, also have the understanding of the common cultural issues [1]. Due to globalization, higher education internationalization, student exchange programs and academic mobility and international projects, students and academics tend to search for new ways of studying and teaching English language as means of academic and professional communication. The possibility comes true through redesign of the academic units [2] in teaching the subject 'Foreign language' and balanced forms of learning and forms of assessment.

In these terms the technology of blended learning has become popular among teachers of Russian universities due to a variety of tools in teaching and assessing (face-to-face, online learning and self-study learning). Firstly, blended learning gives the chance to effectively organize the time of the teacher and student. Secondly, this makes the process of learning a foreign language more interesting and accessible. The teacher's tasks are to successfully manage blended learning as much as possible (to combine extra-curricular classroom activities of students), to control self-study and group work of the students, to create online support for students. According to C. J. Bonk and C.R. Graham, students, in their turn, need to formulate terminal learning objective, to define and develop their own style of teaching and work out the individual plan of work [3]. Moreover, J. Watson states that the teacher and students work together, thereby ensuring the quality of instruction and accompanying the educational process in an independent, useful, effective and motivating way [4].

By means of blended learning Siberian Federal University is currently aimed at the training post graduates who are able to work more effectively in the changed conditions of the global market. Publications in international journals, reports with presentations in foreign languages at conferences and symposia, improving the quality of education and research through the participation of students and teachers in the process of applying for various international grants -- all this undoubtedly requires the development of cross-cultural professional communicative competence in future scientists.

Since 2014, as part of the educational standard, the organization of autonomous work in the framework of blended and distance learning of post graduate students has been carried out by means of LMS Moodle (Learning Management System), which allows

creating a virtual environment for virtual e-learning, which includes tools for preparing and delivering educational content, as well as educational management tools process. Implementing Moodle in teaching a foreign language helps to form the post graduate students' ability to plan and organize, evaluate and adjust their learning activities, focusing on the final result. This form of work allows the learner's autonomy, which makes it more effective in a competitive educational environment. Post graduates learn to make decisions, make choice and take responsibility, develop skills to work in the information environment, search for data, independently select and analyze information, and present results by means of various modern technologies. Moreover, due to the development of autonomy of the post graduate students in the process of training, the scientist will be able to take responsibility for making professional decisions, transfer knowledge and experience to new professional situations, adequately assess their professional capabilities and, if necessary, fill the gaps in knowledge and experience. This approach is expected to result in assessment procedures becoming a factor of an individual learner's development, not merely a matter of obtaining statistics on students' satisfying a subject-related set of pedagogical demands. The prospects are based largely on the recent findings of language pedagogy, namely regularities associated with the needs of the coming generation of professionals in the globalized environment of the 21st century [5].

This article focuses on providing arguments in favor of transforming present-day assessment tools in compliance with on-line methodology and social demand reflected in the goal of foreign language teaching in a post graduate course at a higher school. According to Vonog V. V. and Prokhorova O. A. [6], LMS Moodle can be an effective technology from the point of view of assessment tools and feedback. There is considerable potential for multimedia technologies to make feedback richer and personalized, as well as for a wider range of learner skills and attributes that can be demonstrated through assignments that include, for example, e-portfolios, blogs and wikis. In addition, online tools can support peer and self assessment in any location and at times to suit learners, as the value of peer and self-assessment in developing learners' ability to regulate their own learning is increasingly recognized. However, technology only provides the potential for enhancing assessment and feedback. Transformative effects are more likely when there is a clear educational purpose behind the proposed innovation (for example, to increase learners' autonomy, to enhance the quality of feedback or improve teaching efficiency) and when the use of technology is skillfully contextualized within the academic and wider social context.

## 2. Theoretical Framework

Analysis of recent research devoted to the problems of pedagogical guidance, in particular to assessment tools used in higher education, shows that growing attention is given to systemically assessing overall intercultural foreign language professional communicative competence (IFLPCC) [7], [5] and its individual aspects, namely to testing linguistic competence [8], profession-oriented oral foreign language skills [9], self-assessment [10], [11] and mobile assessment means [12]. Among conclusions particularly relevant to our research are those concerning the use of profession-oriented situations and students' creative work [13], [14] as instruments of assessing IFLPCC. Promising results were obtained in connection with alternative methods of evaluation in teaching foreign languages to students of engineering majors [15], as well as to a new productive-learning-activity approach to pedagogical guidance and specifically to the assessment of foreign language vocational training outcomes [5, 16].

Foreign authors-researchers of the problems of assessment [17], [18], [19], [20], [21] mainly focus on similar educational topics that confirm the general trend in the development of tools for pedagogical assessment.

A number of developments in learning sciences have contributed to a deeper understanding of the relations between feedback processes and effective learning [22]. Such developments have particularly acknowledged the importance of learner self-regulation and peer-assessment in deeper engagement and effective learning [23]. Another emphasis on developing and assessing characteristics and dispositions of learners that augment more traditional areas of the curriculum -- often classed as '21st Century skills' -- has also become a familiar mantra within the field. This focus acknowledges the digital and participatory worlds that children and young people increasingly need to negotiate [24]. However, this view is often clouded by a naiveté about young people's natural competence and agency within these worlds, through notions like the much-critiqued concept of the 'digital native' [25].

Additionally, it is generally poorly understood how to translate these ideas into practice, and they often play out in the classroom through methods that replicate existing and traditional assessment practices rather than embracing or supporting new digital practices that give learners opportunities to flourish and have more say in their education [26].

These advances have been paralleled by a dramatic increase and interest in the use of digital technologies in society and for learning. As Pellegrino and Quellmalz state 'there is an interesting and powerful confluence among theory, research, technology,

and practice, especially when it comes to the integration of curriculum, instruction, and assessment' [27]. The increasing influence of digital worlds means that young people are seen to be taking on new participatory and collaborative roles in learning online and outside the classroom, and there is a growing interest in incorporating these roles and practices inside education. Combine this with the relentless enthusiasm of many in politics and education for the transformative potential of 'e-learning' and it is not surprising that the use of technology for evaluation -- commonly known as 'e-assessment' or, more recently, assessment with improved technology -- is under pressure to help facilitate assessment reform.

Bennett argued that the 'incorporation of technology into assessment is inevitable' [28]. However, as has been demonstrated by the introduction of many new 'innovative' technologies, the view that educational reform through technology is 'inevitable' and pre-determined is usually tempered by the challenges in implementation and complexity of change in education systems. However, there is not enough research to understand how technology-based assessment can help shape and drive wider changes in assessment. With the potential to increase personal development, self-regulation and peer involvement in learning, as well as offering the chance to elicit and evaluate complex skills and practices, digital tools may well provide a useful catalyst for the assessment system.

### 3. Methods

During the study period (2014--2019), about 750 post graduate students of non-linguistic specialties participated in a blended learning course.

In the study, the authors of this paper monitored and analyzed post graduates' record, reflected their achievements by means of technology-based assessment provided by the blended learning course 'English for post graduate students'.

Such tools as Chat, Blog, Wiki and Forum act as online platforms necessary for the work in the sphere of teaching foreign languages. A chat is a form of group communication in the Internet in real time. A blog is a shared on-line journal where students can post diary entries containing text or images. A forum is a set of sections for virtual discussion of the subjects. With a Wiki -- a site on the Internet - users can change the structure and contents independently by means of the tools provided by a site. Unlike the teacher's website the blog acts as a mean of the organization and assessment of the educational process which has a number of obvious advantages. This tool helps to organize personal educational environment of the teacher and students as all necessary

materials for the lessons and records are in one place, and they can be available from any computer having access to the Internet. These materials can be easily corrected, references may be quickly added to the various Internet resources, slide presentations can be included (for example, lectures), as well as multimedia (photos, charts, schedules, audio and videos). The blog also helps to optimize the academic research. Because of lack of time in the classroom and the limited scope of training courses there is a main risk for all post graduate students not to present their ideas and participate in the group and pair discussions. Blogging allows the post graduate student to control their education process, while searching for appropriate information and receiving feedback from other people, so in fact blogs promote the development of educational autonomy and the understanding of the learning importance. The regularity of work also provides the intensity of the educational process and the post graduate students' awareness in certain topics. Another major component of the social Internet is Wiki technology, which is being used in teaching and acting as a pedagogical technology. It is focused on the ability of students to find the necessary information independently, to allocate the problems and ways of their solution, to analyze the obtained knowledge critically and apply it practically. It is able to enrich and expand the forms of educational interaction by involving students in the process of searching individual information and mastering communication skills.

Wiki is a freeware tool for collective creation, editing, storage and structuring of hypertext, which makes it easy to make a connection between pages or fragments of a database.

Peer and self-assessment are used for assessing group work via online peer moderated marking tools. This allows for group and self-assessment activities using assessment criteria customized by the tutor [29]. A group mark is awarded based on an assessment of oneself and peers.

Modernization of instruction and an emphasis on the competence-based approach have changed the way of formative control during a post graduate course. The formative control is held in the way of 'a mock conference' [30] with a discussion of reports prepared by post graduate students. Modeling participation in the round table brings graduate students of non-linguistic profile to the real conditions of their professional activity; allows for the development of soft skills, namely speaking skills, and the application of the basics of public speech: the skills of preparing scientific reports and presentations (using a professionally oriented language); helps to develop the ability to ask and answer questions while discussing issues related to the specialty. We agree with

the opinion of Yarotskaya L. V. that in the case of scientific communication, cooperative activity of students should form the basis of educational role-playing modeling [5].

Preparation for such 'mock conference' includes several stages, each of which is prescribed in the syllabus 'Foreign Language' and in the student performance assessment system. The process of preparing this conference may be divided into the following stages:

- I. Content-based stage;
- II. Lexical and grammatical stage;
- III. Organizational stage.

During the content-based phase, each post graduate student is to read 200,000 symbols (approximately 100 pages) of authentic texts (articles from peer-reviewed journals); prepare a report with a presentation on authentic texts (summarizing material); prepare a glossary with the terminology that will be used in the report in the form of handouts for other participants (20--25 terms). To select articles from foreign journals, post graduate students should use the databases of Web of Science, Scopus, as well as journals of publishers whose sites are available on the website of the Scientific Library of Siberian Federal University.

Presentations, a glossary, handouts, a good command of English and active participation in discussion - all these elements have become an integral part for a positive feedback. Since "mock conference" implies discussion of a wide range of topics, including innovation in construction, innovation management, project management, heating using solar energy, technology that optimizes the heat transfer of buildings, etc, special attention is paid to creating a list of glossary obtained in the process of reading authentic literature, and is given to participants in the form of handouts.

The purpose of the lexical and grammatical stage is to study not only the necessary scientific glossary related to the presentation topic, but also the algorithm for presenting the material in public, the main stages of the presentation, speeches, language clichés used at symposia, colloquiums and conferences. Future scientists study lectures using multimedia applications; interactive materials and assignments, hyperlinks to Internet resources (necessary for their future scientific foreign language communication) presented in the Blended Learning course 'English for post graduate students'.

The organizational stage is dedicated to the planning of presentations, the appointment of a moderator of a 'mock conference'.

## 4. Results and Discussion

The Blended Learning course 'English for post graduate students' is used for the implementation of modern educational resources in SibFU. Blended learning enables to use many different forms and methods in foreign language teaching. This course uses practical tasks to develop the language and communication skills of students who need to use English in a scientific research and professional environment.

Course instructions were designed to help post-graduate students navigate in the interface of the system and use all its capabilities to improve their overall performance in the learning environment. They include learning objectives, suggestions for e-learning on the LMS platform, detailed planning for an academic year, deadlines when material needs to be learned by assessment criteria. Postgraduates studying by correspondence receive support and carry out assignments online.

This course is divided into eight theme modules: The scientific community; Writing up research; Writing a scientific research article; Preparing reports and presentations; Attending the conference; International cooperation and research visits; Translating scientific papers. Each module contains various activities for communication, assessment, self-study and administration.

During the classroom face-to-face sessions post-graduate students show their progress, have an opportunity to communicate with the teacher, to work in a team, etc. Supplementary materials, tests, interactive lectures, video, hyperlinks are given on the on-line platform.

The blended learning and synchronous online learning, which combines computer-mediated activities with traditional face-to-face classroom methods, gave us a great opportunity to use the best of current assessment tools.

Testing provides an array of benefits for both the learner and the teacher and can be used in traditional, blended and online learning contexts. We designed varying types of tests, such as multiple-choice tests, fill-in-the-blanks, true or false, or essay questions. Testing can be made unique by randomizing question and answer order. This is especially useful when the student must redo a test if they previously had poor performance. Meeting the needs of different learning styles gives a chance to engage everyone in an online class.

Using the reporting system, the teacher can view test results, be able to analyze which students scored the highest/ lowest scores, and which questions were the most difficult/simple for most students. Reporting is a handy tool that allows us to see and respond to trends in order to improve the course.

Online testing is good for students because it allows them to know immediately what they did wrong, what they need to focus on, and how to improve should they have to retake the test.

Thus, virtual environments create a number of new possibilities for assessment that allow teachers to quickly see meaningful student responses and adjust teaching based on their needs.

While working online, students will find a Glossary with automatic hyperlinks, containing explanations of useful words and expressions common to all fields of scientific research studies.

E-learning has a variety of tools for promoting teacher-student interaction and collaboration like Discussion Forum, Chat Room and Wiki.

Using Discussion Forums and Chat Rooms postgraduate students discuss difficulties and peculiarities of translating scientific and professional texts. In traditional face-to-face classroom teaching due to lack of time in class not all students have a chance to speak. Conducting chats and forums allows a postgraduate student to manage the process of self-education by searching information in web and receiving comments from the teacher and other students. Unlike the Discussion Forum, the News Forum is an interactive tool that allows the teacher to immediately deliver information messages and announcements to postgraduate students.

The blog as a tool for administering and monitoring the educational process helps organize a personal educational space for the teacher and the student, since all the necessary materials are kept in one place and are available from any computer that has access to the Internet. We can quickly improve the materials, add links to a variety of Internet resources, including slide presentations (for example, lectures) and multimedia (photos, diagrams, graphs, audio and video).

Wiki is a powerful means for collaborative work of students, aimed at developing core competencies and skills needed for a successful scientist: finding necessary information, identifying and analyzing problems, solving them, working in a team. Postgraduate students are engaged in independent search for information concerning scientific methods and research tools, and also they create and develop Wiki content together.

According to our observations, the Blended Learning course 'English for post graduate students' and modeling of public speaking in a foreign language in 'mock conferences' motivate post graduates to participate in international conferences and seminars more actively. The issues that are discussed during the presentation are usually improved, the participants' reports become more practice-oriented and their further presentations seem to be more confident. Usually, during the first year of postgraduate

course, future scientists take part in the international conference 'Youth and Science: Svobodny Prospect', where working language is English in the workshop 'English for scientists'. The conference has been held as part of the week of science at Siberian Federal University since 2010. In the process of development, the conference changed in accordance with the requirements of higher education. Initially, it was divided into separate workshops: students, masters and post graduates. In this regard, in 2013, with the participation of more than 80 people in one workshop of the conference, it was decided to organize a special workshop only for postgraduates and students taking the PhD program at Siberian Federal University.

## 5. Conclusion

Thus, the proposed course of scientific English language for post graduate students in terms of digital educational environment assumes the following learning outcomes: development of various reading strategies (studying, familiarizing, searching and viewing) on the basis of authentic general scientific and scientific texts in the specialty of different volumes; development of oral speech perception skills in general scientific and highly specialized subjects on the basis of lectures by native speakers and students' acquaintance with generalized algorithms of vocational speech behavior in situations of foreign-language communication; formation of skills of public speech in the format of scientific presentation, report at scientific conferences; development of skills of foreign-language communication on scientific topics (conducting discussions in the group on topical scientific themes and making reports with presentations); development of skills and abilities of productive written speech, including through the abstracting of the contents of scientific articles in English, annotation of scientific articles; writing scientific articles on the problems of scientific research; ability to correctly fill out various application forms, documents for a grant and a patent; ability to make out information extracted from foreign sources in the form of a translation or resume; expansion of the lexical minimum associated with the research; an extension of the grammatical minimum used in the field of scientific communication.

The use of the Moodle system in the framework of blended and distance education as well as technology-based assessment (Wiki, chat, forum, peer review, peer feedback) enables post graduate students to develop not only communicative skills of mastering all types of speech activity that are professionally relevant for the future specialization, but also soft skills, i. e. ability of independent search for knowledge through working with additional information resources, working offline, efficient planning and

time management. It will also contribute to increasing motivation and will allow any post graduate to strategically determine further self-development in terms of digital educational environment, which will ensure university mobility and competitiveness in the international labor market.

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