

ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ В ОБРАЗОВАНИИ

УДК 371.31

Krasavina Yulia V.

Ph.D. student, Department of Professional Pedagogy, M. T. Kalashnikov Izhevsk State Technical University, Izhevsk.

E-mail: juliadamask@yandex.ru

Al Akkad M. Aiman

Ph.D. in Engineering, Associate professor, Department of Computer Engineering and Automation, Coordinator for International Affairs of Mechanical and Electrical Engineering Faculty, Damascus university, Damascus, Syria.

E-mail: aimanakkad@yahoo.com

DEVELOPING PROFESSIONAL INFORMATION AND COMMUNICATION SKILLS THROUGH E-PROJECTS

Abstract. The objective of the study is to show advantages of the method of e-projects. According to the authors of the publication, e-project based approach is a promising form of blended learning in universities.

Methods. The authors present the technology of professional competencies formation of future teachers during the teaching process of the discipline «English language» on the basis of the analysis and generalisation of existing sources on blended learning and the free Web application Moodle that allows organising e-training. The Expert Group Appraisal method was used to define levels and components of the competencies.

Scientific novelty. Introducing e-project as a part of students' self-study in English for Special Purposes (ESP) curriculum is especially beneficial if the following objectives are stated: strengthening cross-curriculum knowledge that implies deepening and acquiring new knowledge both in English and in disciplines that are important for future profession; and developing professional information and communication (ICT) competency.

Results. This paper presents the experience of executing one of the e-projects in the educational process practice, allowing students not only to ac-

quire professional English competency but also to learn how to create e-courses in Moodle by their own and strengthen their knowledge in modern information and communication space. The article describes the implementation of e-project based approach for teaching English for future teachers (bachelor students) in Kalashnikov Izhevsk Technical University. This paper presents the experience of executing one of the e-projects that was made by one of the students.

Practical significance. The research outcomes and recommendations can be used for effective implementation of e-project based approach for teaching English in higher vocational institutions.

Keywords: project-based learning, e-project, ICT-competency.

Красавина Юлия Витальевна

соискатель по кафедре профессиональной педагогики Ижевского государственного технического университета им. М. Т. Калашникова, Ижевск.

E-mail: juliadamask@yandex.ru

Аль Аккад Мхд Айман

кандидат технических наук, доцент кафедры компьютерной инженерии и автоматизации, координатор по международным делам факультета машиностроения и электротехники Дамасского Университета, Дамаск (Сирия).

E-mail: aimanakkad@yahoo.com

РАЗВИТИЕ ПРОФЕССИОНАЛЬНОЙ ИНФОРМАЦИОННОЙ И КОММУНИКАЦИОННОЙ КОМПЕТЕНЦИИ МЕТОДОМ ПРОЕКТОВ В ЭЛЕКТРОННОЙ СРЕДЕ

Аннотация. Цель статьи – показать преимущества метода электронных проектов, который, по мнению авторов публикации, является одним из самых перспективных при смешанной форме обучения в вузе.

Методы. На основе анализа и обобщения существующих источников о смешанном виде получения высшего образования и на базе свободного веб-приложения Moodle, позволяющего организовать электронное обучение, предложена авторская технология формирования профессиональных компетенций у будущих педагогов в процессе преподавания дисциплины «Английский язык. Профессиональный перевод». Для определения структуры и уровней развития данных компетенций использовался метод групповых экспертных оценок.

Научная новизна. Показаны возможности применения электронного проектирования при организации самостоятельной работы студентов. Демонстрируется, как данный метод способствует укреплению межпредметных связей – получению и усвоению новых знаний по различным дисциплинам учебного цикла, важным для будущей профессиональной деятельности; а также развитию информационно-коммуникационной компетенции.

Результаты. Разработана система электронных проектов для студентов педагогических специальностей, нацеленная на развитие важных для их специальности компетенций: умений работать с иноязычными текстами профессиональной направленности, знаний основ проектирования в электронной среде Moodle, способности осуществлять профессиональные обязанности в современном информационно-коммуникационном пространстве. Описан опыт использования метода электронных проектов в процессе изучения студентами бакалавриата Ижевского государственного технического университета им. М. Т. Калашникова предмета «Английский язык. Профессиональный перевод». В качестве примера подробно разбирается реализация одного из реальных электронных проектов, выполненного студентом этого вуза.

Практическая значимость. Даны рекомендации по внедрению метода электронного проектирования в практику учебного процесса при преподавании английского языка в высшей профессиональной школе.

Ключевые слова: метод проектов, электронные проекты, ИКТ-компетенция.

Introduction

Using technology in the educational process is a powerful tool, which may help us build an effective and exciting learning environment. The degree of integration of information-communication technologies (ICT) into the educational process defines the teaching model and teacher's role in the learning process. Learning that covers content and instructional methods delivered via CD-ROM, the Internet or an Intranet as well as audio- and videotape, satellite broadcasting and interactive TV is mostly referred to as e-learning [8, p. 130]. Although there is no agreement on common definitions, e-learning is commonly adopted as an umbrella term for virtual learning, online learning, web-based learning, computer-based learning, etc. [4, p. 91] Undoubtedly, e-learning possesses a number of advantages, including increased students motivation and engagement, interactivity and personalization [5, p. 17]. However, it lacks face-to-face communication, which is typical for traditional teaching, and doesn't provide the student with important information channels such as facial expressions, body language, tone of voice, and eye contact. In virtual learning, there is a problem of students cheating in exams, which needs careful handling and special procedures like those used in the Syrian Virtual University [2, p. 19]. An approach which combines advantages of traditional in-class teaching and e-learning is referred to as blended learning.

Blended learning (sometimes, hybrid or mixed learning) is defined as a combination of face-to-face and technology-mediated instructional

forms and practices [6, p. 1]. The taxonomy of blended learning still needs thorough consideration [11, p. 8; 6, p. 7], but it can be categorized by such criteria as course type (by the prevailing of either traditional learning or e-learning), learning environment (using technology inside or outside the classroom), frequency (using technology on regular bases or occasionally), learning path (learning in groups or individually), learning outcome (acquiring new knowledge and skills or deepening the knowledge and skills which a student already had).

A promising form of blended learning is an integrating technology with a project-based learning, or e-project based approach. Project-based learning has been proved to be more effective for developing problem-solving skills, deeper understanding of academic content, improved critical thinking and students motivation [10, p. 7]. Together with technology, it may also contribute to developing students' ICT skills that are vital skills of the 21st century. This paper presents some results and findings of implementing e-project based approach for teaching English for future teachers (bachelor students) in Kalashnikov Izhevsk Technical University in the framework of blended learning.

E-project background and objectives

Project-based learning creates a learning environment that brings into practice the basic principles of competency-based approach in education [1, p. 186]. By being active learners while doing the project, students acquire skills and knowledge that are vital for the core competencies of the 21st century: research skills (defining and analyzing the problem, information search, monitoring, hypothesizing and drawing conclusions), teamwork, communication skills, etc [13, p. 259]. Introducing project-based learning in English for Professional Purposes Curriculum for future teachers implies integration of language, content and skills that promotes forming their professional competency. Here, teacher professional competency may be defined as the integration of theoretical and practical readiness to conduct the teaching practice [9, p. 30].

Teaching standards and other documents in the field of education [14–17] make it clear that in the 21st century the teacher is expected to:

- Develop transversal skills vital for professional and personal growth;
- Have ICT competency, emphasizing that it is not enough for teachers to have ICT competencies and be able to teach them to their students. Teachers need to be able to help the students become collaborati-

ve, creative, and problem-solving learners through using ICT; so they will be effective citizens and members of the workforce. [16];

- Have intercultural competency, where the knowledge of the second language comes as a huge advantage.

Taking all mentioned above into consideration, introducing e-project as a part of students' self-study in English for Special Purposes curriculum will be beneficial if the following objectives are stated:

- Strengthening cross-curriculum knowledge, that implies deepening and acquiring new knowledge both in English and in disciplines that are important for future profession;

- Developing professional ICT competency.

Using the means of instructional design, we transform the project objectives into certain learning outcomes [7, p. 186; 12, p. 78]. The Expert Group Appraisal method was used to define levels and components of the competencies mentioned above. The experts (qualified teachers) were asked to define ICT skills that are required and most important in their teaching practice. According to the results of experts' opinion poll the future teacher should be able to:

- Work with MS Office applications: MS Word (interactive text structure), MS PowerPoint, MS Excel (spreadsheets for analyzing data and recordings in teaching practice);

- Design e-course elements (in our case, in Moodle learning environment);

- Work with Internet (information search, professionally-oriented websites);

- Create visual aids and animations (in our case, with Windows Movie Maker).

Basing on the results of the experts' opinion poll we have developed a system of e-projects for trainee teachers, where they were supposed to gradually develop and strengthen ICT skills that would be useful for their future career. Students undertake their first e-project «University Guide» during the 1st (winter) term of the first year of study, and the last one «My e-lesson» during the 2nd (spring) term of their last year of study. The last project product is taken into consideration while assigning the grades for their final professional qualification.

This paper describes the experience of realizing one of the e-projects into the educational process practice at Kalashnikov Izhevsk State Technical University for teaching English for Specific Purposes (ESP). The targeted students are future teachers of general technical disciplines.

E-project description

The project is intended to be the final element of students' self-study organized in an electronic environment. Students are supposed to make the project after completing a number of tasks aimed at acquiring general vocabulary in Electricity, and improving both their listening and reading skills. As a result of completing the group project, the students create interactive mini-encyclopedia containing information about famous scientists in the field of Electricity and Electromagnetism «Pioneers in Electricity and Electromagnetism» in English.

In this work, the fundamental steps of e-project completion were the following:

- *Preparatory*: when the students and instructor agreed on project objectives, and the theme, determined the final learning outcomes and structured the project;
- *Learning*: when the students gained knowledge both in ESP (high frequency words in their project topic), and in ICT (designing an e-course in Moodle environment);
- *Research and Design*: when students conducted research about certain scientist in Electricity and Electromagnetism and prepared a project product (an e-course element including a PowerPoint presentation, prior knowledge assessment, a test and hyperlinks for further information);
- *Control and Assessment*: when students presented their final product and evaluated the project.

E-project implementation

The participants were second-year university students enrolled in the «Education in Technology» bachelor program (19 students). English Language is a compulsory discipline offered during the first two years of their studies. During the first year students take a course in General English. During the second year they are offered a course in English for Business Communication and a course in English for Special Purposes (professional communication).

The project was realized in a hybrid form. In-class teaching included introducing the project objectives and targets, negotiating about choosing the research area, providing extra help and guidance if necessary and presenting the project results.

E-learning mode was implemented in Moodle platform. The suitability of Moodle for the realization of the Project method is ensured by the following features:

- It presents verbal information (text, graphics and sound) and provides interactive feedback;

- It provides direct practice of ICT skills with informative feedback;
- It provides step-by-step course structure including setting deadlines, which is suitable for the implementation of the Project-based learning;
- Most of the ISTU e-courses are realized using Moodle.

E-project guiding was implemented through an e-course, providing clear instructions for every step of the project completion, as well as plenty of resources. E-course design ensured ending every step of the project with a certain achievement that can be controlled and assessed – a presentation, a report or a test. Feedback and online consultation were provided through the Forum dedicated for this course, where students could ask any question about the project.

Results and discussions

The e-project effectiveness was assessed using two criteria – students' performance and students' satisfaction [3]. Students' performance or students' learning outcomes were evaluated through a Final Test and compared to the results of input tests, besides we evaluated the e-project products.

Each student created a lesson in Moodle environment that included a PowerPoint presentation about a famous scientist biography and achievements, input and output tests, useful links for further learning, and a forum for discussions. Concerning students' presentations, 74% of them were evaluated as 80 of 100 points and up (considering presentation content, visual aids and delivery). While creating tests in Moodle, students used variety of different questions (multiple choice, True or False, short answers), and more than 90% of test questions were composed taking into consideration basic rules of instructional design. Further analysis of students' project products showed that e-project was highly effective in developing students' ICT skills. At the end of the e-project, students were asked to list some professionally-oriented problems that can be solved using the ICT skills acquired during the e-project. Their answers showed that they understood the importance and perspectives of using ICT in Education, and this fact takes their ICT competency beyond just Technology Literacy and close to Knowledge Deepening approach, where ICT is applied for solving real-life problems [16]. The created e-course as a result of the group project can be accessed at <http://e-learning.istu.ru/course/view.php?id=128>, one has to enter as a guest («zaiti gostem») using a password «scientists».

Concerning English skills and vocabulary acquisition, our findings showed that 79% of students demonstrated considerable improvements

in reading and listening skills in their research area. In fact, they demonstrated better vocabulary knowledge in that specified areas than in general vocabulary concerning Electricity and Magnetism they had studied before. Here the recommendations would be that when organizing self-study in electronic environment, the e-project should be combined with some regular activities for revising general vocabulary.

Improvement in ESP skills are also supported by students' self-assessment results. Before starting the project, when evaluating their ability to read and understand professionally-oriented English references, 63% of students said that they could not do it or could do that with great difficulties, while after the completion of the course, this percentage was reduced to 32%.

Student satisfaction was assessed on the base of the findings of student interviews and questionnaires. Their feedback on doing e-projects was positive, 90% of students agreed that they enjoyed learning through e-projects. Some of the students (32%) appeared to be really enthusiastic and initiative about the project by creating additional elements that they were not supposed to do. Apart from that, students liked the general idea of organizing their self-study in electronic environment, 90% of the students stated that they preferred it to traditional form. E-form of self-study stimulates learning because current generations are familiar with computers and this form is close to what they are used to in everyday life. «You are surfing the Internet, and then you remember, that you have your project to do, and you say, I'm already there, so you start doing that». Other factors that lead to students' positive evaluation are shown in table.

Besides, the majority of student answers showed that working on the project didn't increase general time they usually spend with computers, it actually replaces the time for playing on computer and social networking, making it meaningful and fruitful (63% agreed about that). Students mentioned technical problems as a complication of self-study in an electronic environment (37%). It is worth mentioning that although teacher's feedback was provided in the form of a forum for discussions, students avoided using it, and preferred sending private messages instead. Their reasons proved that most of the students still had fear of «showing to other students that they can't do something without help». Asking for help when needed is a great skill of a productive team-player, and teamwork skills are vital for the 21st century citizens. Here the recommendation would be to explain to students why it's important for the teacher to be aware of all the difficulties they faced while doing the project, and why it is more effective if teacher's answers would be available for all the project participants.

Aspects of organizing students' self-study in e-environment that students consider to be beneficial

Reason	Frequency, %
Acquisition of ICT skills that will be useful for future profession	95
Studying English websites about Electricity and Electromagnetism and famous scientists	90
Prompt evaluation and feedback	84
Convenience (anytime, anywhere, if the Internet is available)	68
Possibility of instant repeating of some activities, if they are not successful first time	68
Saving resources (like paper)	4
Plenty of resources are available	4

Conclusion

After completing the e-projects with the group of future teachers, the following conclusions were made:

- E-projects-based learning reflects the principles of competency-based approach by focusing on active learning and developing vital professional competencies;
- E-projects-based learning doesn't eliminate traditional in-class teaching, but contributes to learning process through engaging students in meaningful self-study computer-based activities;
- E-project-based learning proved to be both motivating, effective, and it develops students' ICT skills and cross curricular knowledge.

The following recommendations could be given while designing an e-project:

- While choosing the project title, the research area, and ICT skills to be developed, it is vital to analyze what students really need for their future successful career;
- As the project focuses on a narrow specified area of research it is important to provide some parallel activities to help students revise other important information on the discipline (in case of ESP, it is general vocabulary and grammar skills);
- Using technology may cause unexpected technical problems, and it is necessary to be proactive and think about possible difficulties beforehand providing a solution for unfavorable situations;
- In order to make e-environment more user-friendly and less «absent», it is better to use emotionally rich elements. Most students (78%)

agreed that motivating phrases and colorful pictures made the learning process in e-environment more engaging and enjoyable.

Статья рекомендована к публикации
д-ром пед. наук, проф. Л. В. Зайцевой

References

1. Abakumova N. N., Malkova I. Yu. Kompetentnostnyi podhod v obrazovanii: organizaciya i diagnostika [Competency-based approach in education: organizing and evaluation]. Tomsk: Tomski gosudarstvenyi universitet [Tomsk State University]. 2007. 368 p. (In Russian)
2. Al-Akkad M. A. Online Learning Experience in Syria. *Intellectualnie sistemi v proizvodstve*. 2007. № 1. P. 10–21.
3. Al Akkad M. A. The Impact of Administration on Education Quality. *Proceedings of III International Conference «Technical Universities: Integration with European Educational systems»*. Izhevsk, 2008.
4. Anohina A. Analysis of the terminology used in the field of virtual learning. *Educational Technology & Society*. 2005. № 8 (3). P. 91–102.
5. Groff J. Technology-rich innovative learning environments. *OECD – CERl Working Paper*. 2013. 30 p. Available from: <http://www.oecd.org/edu/ceri/Technology-Rich%20Innovative%20Learning%20Environments%20by%20Jennifer%20Groff.pdf>.
6. Friesen N. Report: Defining Blended Learning. *Report*. 2012. 10 p. Available from: http://learningspaces.org/papers/Defining_Blended_Learning_NF.pdf.
7. Krasavina Yu. V. Instructional design: creating an electronic course for learning English. *Technical Universities: integration with European educational systems: proceedings of VI EQ international conference*. Izhevsk: M. T. Kalashnikov publishing house, 2014. P. 184–186.
8. Moore J. L. e-Learning, online learning, and distance learning environments: Are they the same? / Moore J. L., Dickson-Deane C., Gal-yan K. Internet. *Higher Education*. 2011. № 14. P. 129–135.
9. Pedagogika: Uchebnoe posobie dlya studentov pedagogicheskikh zavedenii [Pedagogy: A course book for trainee teachers] / Slastenin V. A., et al. Moscow: Shkola-Press, 1997. 512 p. (In Russian)
10. Research summary: PBL and 21st century competencies. 2013. 2 p. [online] Available from: http://bie.org/object/document/research_summary_on_the_benefits_of_pbl.
11. Staker H., Horn M. B. Classifying K 12 blended learning. Mountain View, CA: Clayton Christensen Institute. 2012. 22 p.
12. Shishlina N. V., Savinova A. R. Zadachi prepodavatelya elektronogo kursa [The tasks of an e-course teacher]. *Otkrytoe I distan-*

cionoe obrazovanie. [Open distant education]. 2013. № 1. P. 77–82. (In Russian)

13. Shikhova O. F., Shikhov Yu. A. Formirovanie kompetencii studentov – budushih pedagogov na osnove metoda proektov [Developing competencies of future teachers through project-based learning]. *Innovacionnye processi v obrazovanii: strategiya, teoria, praktika razvitiya*. [Innovative processes in education: strategy, theory, development practice]. Materials of VI all-Russian scientific conference. Yekaterinburg, 2013. P. 258–260. (In Russian)

14. Nacionalnaia doktrina obrazovaniya v Rossiiskoi Federacii. [The National Doctrine of Education in Russian Federation]. Rossiiskaia gazeta, 2000. Available from: <http://www.rg.ru/2000/10/11/doktrina-dok.html> (accessed 01.12.2014). (In Russian)

15. Proekt professionalnogo standarta pedagoga. [The draft professional standard for teachers]. Ministerstvo obrazovaniya i nauki Rossiiskoi Federacii [Ministry of Education and Science of the Russian Federation]. 2013. Available from: <http://minobrnauki.rf/dokumenty/3071>. (In Russian)

16. UNESCO ICT Competency Framework for Teachers (ICT-CFT), 2011. *UNESCO: website*. Available at: <http://ru.iite.unesco.org/publications/3214694/>.

17. Federalnyi gosudarstvennyi obrazovatelnyi standart vysshego professionalnogo obrazovaniya po napravleniu podgotovki 051000 «Professionalnoe obuchenie (po otraslyam)» [Federal State Education Standard of Higher Professional Education for Professional Teaching specialty area]. Ministerstvo obrazovaniya i nauki Rossiiskoi Federacii [Ministry of Education and Science of the Russian Federation]. 2009. Available from http://www.edu.ru/db-mon/mo/Data/d_09/prm781-1.pdf. (In Russian)

Литература

1. Абакумова Н. Н., Малкова И. Ю. Компетентностный подход в образовании: организация и диагностика. Томск: Томский государственный университет, 2007. 368 с.

2. Красавина Ю. В. Instructional design: creating an electronic course for learning English // Технические университеты: интеграция с европейскими и мировыми системами образования: материалы VI Международной конференции. Ижевск: Иж ГТУ им. М. Т. Калашникова, 2014. С. 184–186.

3. Педагогика: учебное пособие для студентов педагогических учебных заведений / В. А. Слостенин [и др.]. Москва: Школа-Пресс, 1997. 512 с.

4. Шишлина Н. В., Савинова А. Р. Задачи преподавателя электронного курса // Открытое и дистанционное образование. 2013. № 1. С. 77–82.

5. Шихова О. Ф., Шихов Ю. А. Формирование компетенций студентов – будущих педагогов на основе метода проектов // *Инновационные процессы в образовании: стратегия, теория, практика развития: материалы VI Всероссийской научно-практической конференции*. Екатеринбург, 2013. С. 258–260.
6. Национальная доктрина образования в Российской Федерации [Электрон. ресурс] // *Российская газета*. 2000. URL: <http://www.rg.ru/2000/10/11/doktrina-dok.html> (дата обращения 01.12.2014).
7. Проект профессионального стандарта педагога [Электрон. ресурс] // Сайт Министерства образования и науки Российской Федерации. 2013. URL: <http://минобрнауки.рф/документы/3071> (дата обращения 05.04.2014).
8. Структура ИКТ-компетентности учителей. Рекомендации ЮНЕСКО (2011) [Электрон. ресурс] // Сайт ЮНЕСКО. URL: <http://ru.iite.unesco.org/publications/3214694/> (дата обращения 05.12.2014).
9. Федеральный государственный образовательный стандарт высшего профессионального образования по направлению подготовки 051000 «Профессиональное обучение (по отраслям)» [Электрон. ресурс] // Сайт Министерства образования и науки Российской Федерации. 2009. URL: http://www.edu.ru/db-mon/mo/Data/d_09/prm781-1.pdf. (дата обращения 01.12.2014).
10. Al-Akkad M. A. *Online Learning Experience in Syria* // *Интеллектуальные системы в производстве*. Ижевск: ИЖГТУ им. М. Т. Калашникова, 2007. № 1. P. 10–21.
11. Al Akkad M. A. *The Impact of Administration on Education Quality* // *Proceedings of III International Conference «Technical Universities: Integration with European Educational systems»*. Ижевск: ИЖ ГТУ им. М. Т. Калашникова, 2008.
12. Anohina A. *Analysis of the terminology used in the field of virtual learning* // *Educational Technology & Society*. 2005. № 8 (3). P. 91–102.
13. Groff J. *Technology-rich innovative learning environments* [Электрон. ресурс] // *OECD – CERl Working Paper*. 2013. 30 p. URL: <http://www.oecd.org/edu/ceri/Technology-Rich%20Innovative%20Learning%20Environments%20by%20Jennifer%20Groff.pdf> (дата обращения 01.12.2014)
14. Friesen N. *Report: Defining Blended Learning*. [Электрон. ресурс] // *Report*. 2012. 10 p. URL: http://learningspaces.org/papers/Defining_Blended_Learning_NF.pdf. (дата обращения 01.12.2014).
15. Moore J. L., Dickson-Deane C., Galyen K. *e-Learning, online learning, and distance learning environments: Are they the same?* // *The Internet and Higher Education*. 2011. № 14 (2). P. 129–135.
16. *Research summary: PBL and 21st century competencies*. 2013. 2 p. [Электрон. ресурс]. URL: http://bie.org/object/document/research_summary_on_the_benefits_of_pbl. (дата обращения 01.12.2014).
17. Staker H., Horn M. B. *Classifying K 12 blended learning* // *Mountain View, CA. Clayton Christensen Institute*. 2012. 22 p.