Integrating E-Learning into the Course of English for Science Students

Creating a New Learning Environment in the Activity of Preparing for a Conference on Speciality

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Abstract: The paper deals with the problem of creating some kind of a blended learning environment for the science students who learn to prepare for a scientific conference on speciality in English. The learning environment is supposed to be effective, supportive, and friendly. In order to get that we have endeavoured to integrate some features of e-learning in the course. The activity of preparation for the conference is described in some detail. The materials and tools employed are considered. Among them there are materials found on the web page *APres* created by the author. The web page has been developed to help the students to cope with the problem of preparation for and carrying out the conference. The language skills and e-learning skills are studied that are formed in the activity. The techniques and tools are described which allow our students to work productively both individually and in collaboration with other students. Both e-learning and traditional methods are involved in the course. Online communication in English is effectively exploited here to promote language learning. Several programme applications are utilized (Google Drive, Google Docs, Skype), which has proved to be useful for the process of preparation for the conference.

1 INTRODUCTION

What kind of a learning environment is to be created in order to help students to study English effectively and to gain the skills in English that are necessary for them in their study and work these days? We are going to examine this problem by considering the case of preparation for a scientific conference in the course of English for science students.

The students doing their degrees at the Department of Natural Sciences (DNS) of Novosibirsk State University (NSU) have a compulsory course of English. Their major is Chemistry. They are trained in their speciality at the research institutes of the Siberian Branch of the Russian Academy of Sciences. The students work under the guidance of research scientists and conduct real research work. That is they have to read a lot of different texts on their speciality in English: scientific papers, monographs, patents, etc. They take part in scientific seminars and conferences. They write scientific papers, conference reports, etc. Thus they are supposed to learn how to communicate in English orally and in written form.

During their course of English the students take part in the activity of preparing for and carrying out the round-table discussion «Materials Review. The Latest Discoveries and Ideas Behind». This is a kind of a training conference. Hereinafter it will be referred to as “conference”. The activity of preparation for the conference is a multimedia project which is in itself a highly motivating use of technology. This provides a meaningful and motivating context to frame learning activities throughout the course.

The learning that happens in the course is problem-based. This kind of learning is based on the concept that if you learn by doing then you will retain the experience more effectively. This approach is based on asking you to solve the problem. In the course the students solve the problem – they prepare and carry out a scientific conference.

The web-based activities are widely used here. They are a part of a blended learning environment in which modern information and communication

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technologies (ICT) both support class-based learning and help to develop independent learning skills in students. The web can be considered as an extension of the English culture and society. By engaging in web-based activities, the students can gradually become the members of the community of English language speakers (Warschauer, 2011).

The students develop traditional literacies and electronic literacies in their course of English. Electronic literacies are very important in many languages. They are especially important in English. This is because an estimated 85 per cent of the electronically-stored information in the world is in the English language (Crystal, 1997).

Our students are considered to be the "net generation". But that does not mean that they are really technologically literate. This is particularly so with teaching English to science students in Russia. Our goal is to help them to gain the relevant digital information literacy, which is supposed to help them both to master English and to learn to prepare for and participate in a scientific conference on their speciality.

In our course electronic literacy skills are integrated in traditional EFL (English as a Foreign Language) classroom. A structured, project-based approach is used. The project is a conference. The learners are engaged in increasingly complex tasks throughout the course. They can get appropriate supporting from the teacher or from the other sources, including online resources. The teacher facilitates learning by moderating the activity, providing advice about the goals of the activity, and being a resource for the students.

The students use a blended learning environment, by which we mean a combination of e-learning or online learning approaches with traditional / face-to-face methods. E-learning can take many forms and is always connected to the environment in which the course is based. The following approaches are used in our course: 1) blended learning, 2) groupware, 3) the world wide web, 4) synchronous learning, 6) asynchronous learning.

Blended learning focuses on the learner and the learner's needs. This helps learners choose what and when to blend so it can be manipulated and controlled by learners rather than teachers. The teacher through effective facilitation supports students in understanding what they are expected to learn. Blended courses create enhanced opportunities for teacher-student interaction, increase student engagement in learning, and give chances for students' continuous improvement (Garrison and Kanuka, 2004; Kenney and Newcombe, 2011; Young, 2002). Blended learning is also known as cooperative learning, which allows students to work closely together to achieve desired goals. The blended learning is the learning environment that is richer than either only traditional face-to-face or fully online environment (Engelbrecht and Harding, 2005). In our course face-to-face contact is not lost because the students and the teacher meet in class and work together at the preparation for the conference there as well as online.

2 PREPARATION FOR THE CONFERENCE «MATERIALS REVIEW. THE LATEST DISCOVERIES AND IDEAS BEHIND»

The students do a lot of traditional exercises in their course of English. They read and translate authentic texts on their particular speciality, review some important grammar points from general English grammar as well as the grammar points specific for the scientific texts. They also acquire scientific lexis and phraseology. The texts are taken from the traditional and electronic scientific journals, monographs, etc. When translating the texts the students use both paper and online dictionaries (for example, www.yourdictionary.com/). The latter are more preferable as they provide both quick search and high quality sound. So one can hear the word, read it and pronounce it after the computer. This is crucially important for science students who study English at the university as EFL.

The students read the texts and do the exercises from the textbook "*Study Guide on the Development of Speaking Skills for Scientists*" (Kostenko et al., 1988). The texts describe the biographies of outstanding scientists, the work of scientific institutions, etc. Thus, the students get the knowledge and skills that will help them to talk about their scientific and practical work, about the laboratory and institute they work at, about their scientific advisor, etc.

There is a lot of information available electronically. This makes cognitive demands on language students. This also creates a rich setting for the authentic tasks and projects that can promote language acquisition. It has been recently recognized in language pedagogy that there is the need to encompass higher cognitive processes in the

learning task. The cognitive approach addresses the need for students to be aware of their learning processes, and to organise and structure their learning themselves (Hanson-Smith, 2011).

2.1 Preparation for the Conference

The activity of preparation for the conference consists of several sub-activities.

First, to prepare reports for the conference «Materials Review. The Latest Discoveries and Ideas Behind» the students use texts from the book "*Materials*" by Robin Kerrod. The texts tell us about various kinds of materials that are produced for the purposes of science and industry and that can also be used in our everyday lives. The topics are: 1) precious metals, 2) alloys, 3) drugs and vaccines, 4) dyes and pigments, 5) natural and synthetic fibres, 7) explosives, etc. (Kerrod, 2002).

The students choose the texts that they like and study them in detail. They work independently. The texts are read aloud, translated into Russian and thoroughly analysed. The students acquire subject-specific lexical items and master their pronunciation. Finally, they discuss the chosen texts with the teacher.

Second, the Organizing committee of the conference is formed. It consists of the Conference organizer, three secretaries and a chairperson. The Conference organizer is the teacher. All the members of the Organizing committee have their own duties. An important approach to learning is employed here – working in small groups (groupware). It is a part of the course. The group takes part in a joint project – the preparation for and carrying out a scientific conference. The students work in collaboration to achieve a common goal.

The procedure of preparation for the conference is as follows.

The teacher as the Conference organizer makes up the "Call for Papers" and e-mails it to Secretary 1. Secretary 1 sends it to all the participants. Then the students send the application letters to Secretary 1. Having received them Secretary 1 makes up the programme of the conference on the basis of the sample of a programme downloaded from the web page *Apres,* which is located at the NSU web portal my.nsu.ru.

In order to write their application letters the students have to do the following. They go online, get to the web page *APres*, find the sample of an application letter, and download this sample. Then they make all the necessary changes in the sample inserting their personal data. In their application letters they specify their name and surname in English, their affiliation, the title of their report, etc. After that they send the application letter to Secretary 1. They have to meet the deadline.

Secretary 2 receives the programme of the conference from Secretary 1, downloads the sample of the "Invitation Letter" from the web page *APres* and having worked up the wording sends individual invitation letters to the participants. After that the participants send their reports to Secretary 3 who is responsible for making up the Book of Proceedings of the conference.

The chairperson has to make up the "Scenario" of the conference. In order to do that they have to get a sample of the scenario and the list of phrases that can be used by the Chairperson. All this can be downloaded from the web page *Apres* as well. Then they make up the scenario for the conference using the sample, the list of phrases and the programme of the conference which they have received from Secretary 1. Secretary 3 arranges the book of Proceedings including all the reports, the programme and the Foreword of the Organizer. Then they print the book out.

The students communicate online using several software applications, which is incorporated into the ongoing structure of homework as an integrated process.

2.2 What Traditional and Electronic Materials and Tools Are Used

The materials or learning resources take a variety of forms and include: 1) interactive materials that the students can access and interact with online; 2) traditional materials (e.g. workbooks, textbooks and lecture notes), 3) the materials especially created by the teacher for the given course; 3) content that they create themselves (e.g. PowerPoint presentations); 4) resources which are simply available on the world wide web (e.g. web pages, downloadable files, and online databases).

Books are probably the major learning resource for any student. The scientific advisers provide them with the lists of books, articles, and monographs that they should study. Students read scientific articles, which they find online. Many journals allow students to download or print a copy of articles but you should check the conditions under which this is provided (Clarke, 2008).

The teacher provides students with lists of books and lists of websites that can be useful in the course. The students have to identify those parts which are most useful to them so that they can use those

elements in writing reports, preparing Power Point presentations, writing e-mails, etc. The resources are effectively integrated in the activities carried out in the course of English.

The students write their conference reports making use of the texts from the book "Materials". They also use special conversational gambits which help to structure the report. The conversational gambits are taken from the manual "*Conference Lexicon*" provided by the teacher. At the conference the students present their reports orally using PowerPoint presentations. These presentations serve as a kind of visual aids here. Presentation software such as Microsoft PowerPoint is used.

When preparing for the conference the students have to download from the web page *APres* the following manuals for speakers and listeners: "*Conference Lexicon"*, "*Question-Answer Techniques"*, *"Discussion Techniques"*, *"Listening Strategies"*, "*Speaking Strategies"*, and *"Some hints for a successful presentation"*. The first manual comprises the phrases that are both necessary and appropriate in the setting of a scientific report. The second and the third ones provide the samples of question-answer and discussion devices to be used in this setting. The manual "*Listening Strategies"* contains recommendations for listeners, the manual "*Speaking Strategies"* – for speakers. And the last manual teaches students how to make the text of the report for the conference, what language to use, and how to deliver the report properly.

The manuals "*Some hints for a successful presentation*", "*Listening Strategies*", and "*Speaking Strategies*" take use of the presentation skills rubric which was developed by Stephen Hoyt for his classes at the English Language Intensive Training (ELIT) Camp hosted in Kazan, Russia in 2010 (Hoyt, 2010).

The following materials are being created during the process of preparation for the conference: 1) Call for Papers; 2) Programme; 3) Letters of application; 4) Invitation Letters; 5) Texts of reports; 7) Book of Proceedings; 8) Power Point presentations.

The students cooperate in the activity of preparation for the conference. Among other applications they use Google Drive, which is a personal cloud storage service. It is known to allow users to store and synchronize digital content across computers, laptops, and mobile devices. It produces storage facilities, production tools, and coordination support (Giemza et al., 2013). It is a repository cloud service. The students are supported in creating an account at the cloud service. The group of students is formed to help each other to accomplish the task – to prepare for a scientific conference. They work together in order to learn and they motivate each other as well. As the old Chinese proverb goes, "Tell me and I'll forget, Show me and I may remember, Involve me and I'll understand."

The Google Drive is used to prepare the programme of the conference, the Book of Proceedings, etc. The teacher creates the primary document, and from then on maintains control of who can view, edit or comment on the file. Every student of the group can do that after they have managed to create their own user account. The secretary responsible for creating the programme puts the draft of the programme into the document made up by the teacher. Then every student can get access to the draft and check if everything is correct with the wording of the topic of his/her report, the spelling of his/her name, etc. The teacher also makes the necessary corrections. After that the programme can be printed out. The finished programme can be further used by the Chairperson of the conference to make up the scenario of the conference.

A set of productivity tools, the Google Docs suite, is employed to collect, arrange, and edit the Book of Proceedings. Everyone is involved in the activity: 1) all students create their reports there; 2) the teacher edits them; 3) Secretary 3 arranges the Book, etc. So the students are able to create, edit, share and collaborate, which can be done any time anywhere. Documents can be accessed and edited both online and offline. Real-time collaboration is possible in the Google Docs suite, which means that more than one person can work together, to edit, chat, make comments and suggestions, and view revision history. They can access, share and edit content just from their web browser.

2.2.1 Assessment in the Course

The assessment of achievement is carried out. Such kind of assessment "aims to establish what a student has learned in relation to a particular course or curriculum" (Brindley, 2011). At the stage of preparation for the conference the following documents are assessed: application letters, letters of invitation, and written reports.

Let us take, for example, the application letter. The sample of the letter is given, and all students should apply it. The secretary who receives application letters can assess them using the sample. The sample of an application letter is as follows:

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Dear Mr Ti,
I am Sergey Petrov from the Chemical
Department of Novosibirsk State
University.
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I would like to take part in the forthcoming conference «Materials Review. The Latest Discoveries and Ideas Behind».

The theme of my presentation is "Precious Metals".

Yours sincerely,

Sergey Petrov

On the Google Drive e-portfolios of all students are gathered and accumulated, which are to demonstrate that the students know how to prepare for a scientific conference, understand what is to be done and are skilled to do that. E-portfolios include a set of documents created in the activity of preparation for the conference, both individually and in collaboration with other students. The individual documents are: the application letters, the letters of invitation, the texts of reports, the threads of email letters concerning the conference, and the Power Point presentations.

2.2.2 Web Page APres

The web page APres is an electronic resource created in order to be used by those who need to learn how to prepare for and give a scientific report at a conference, how to make a good Power Point presentation, how to write an application letter, etc. There are a lot of materials that can be used as self-instructional materials on the page. They can accompany and supplement the self-directed learning.

APres consists of the following sections: 1) General information; 2) Conference lexicon; 3) Presentation techniques; 4) Conferences; 5) Photos; 6) Poster guidelines; 7) Notes for writers; 8) Feedback. Section Conference Lexicon contains the necessary conversational gambits and the manuals for the speakers and listeners. Section Presentation Techniques is dedicated to the ways of preparing and delivering academic presentations. In Section Notes for writers the samples of written documents can be found such as an application letter and an invitation letter.

2.3 E-learning as a Means of Creating a New Learning Environment

In their course of English the science students of the DNS NSU communicate online. Their communication includes the reading and writing of online documents via the Internet as well as asynchronous computer-mediated communication such as email. Face-to-face and e-learning happen, which involve both group and individual activities. Communication in face-to-face situations is a mixture of speaking and listening while in online learning it is about reading and writing (Clarke, 2008).The Internet is integrated in the classroom here. It is viewed and exploited as a major new medium of literacy that needs to be mastered on its own terms for success in the twenty-first century life.

Susan M. Zvacek in her work "Tech-Savvy Students? Maybe Not ..." writes that students today are supposed to have digital information literacy, which means that they have to have relevant communication skills and skills in information seeking (Zvacek, 2013). They are to develop three groups of abilities: hands-on (practical) skills, conceptual knowledge, and intellectual capabilities.

In order to learn effectively you need an environment that helps you to learn (Kochkareva, 2013). Learning requires the students to synthesize information by combining and integrating information from several sources. The environment created in the course provides support for learners. But it also "expects" some things from the learners, too. These include peer support and communication, tutor support and communication as well as moderation of online communication and assessment.

2.3.1 Using Modern Information and Communication Technologies

Our students are technologically adept and ready to use the huge number of resources available online. But many of them do not have the ability to use digital tools effectively. It is the teacher's job to equip students with the opportunities to elaborate relevant practical skills, conceptual knowledge, and critical thinking abilities. This will enable them to use various technologies widely.

Online activities in the course are well-planned and purposeful. So they support the language learning objectives, which are to be achieved. The tasks that the the students are supposed to perform are incorporated in goal-oriented research and communication.

The students can use different media (e.g. video, sound, text) in the course. Software and the Internet provide much data which students may explore. They have to organise the vast amount of data, which is a difficult task. The teacher helps the students to structure their learning so they could take advantage of the available language resources. For example, to help the students to improve their pronunciation we recommend them to use the

Pronunciation Power application (www.pronunciationpower.com). Or they can use the website *Pronunciation of science by Macmillan Dictionary*, which allows to practise the pronunciation of scientific terms (www.macmillandictionary.com).

Students take part in a number of collaborative activities while preparing for the conference. These activities and their coordination are supported by means of computer systems. The use of collaborative software in learning creates a collaborative learning environment (CLE). The CLE supports students in both their individual and cooperative work and helps them to evolve e-learning skills.

2.3.2 Using Synchronous and Asynchronous Methods of Learning

The students employ both synchronous and asynchronous methods of learning. For example, the synchronous method of text, video and audio conferencing. The method is used by the members of the Organizing Committee of the conference. One of them sends a message which is supposed to be discussed within the framework of the preparation. All the others are logged on to the system and they can see it and respond to it. Individual students are located at many different places. They interact with a tutor at the educational institute or with a student who undertakes the facilitator's or moderator's role, e.g. a secretary of the conference. Synchronous text conferencing is presented in threads, which can be referred to later.

The asynchronous method used is email. In the asynchronous email group threaded discussions are conducted, which in our case are series of email messages that are linked to the particular topic – the activity of preparation for the conference on speciality at an English lesson. The key benefit of asynchronous interaction is its flexibility and ability to fit into everyone's working day. Asynchronous communication is sometimes called 'the great equalizer' (Wepner and Mobley, 1998).

In this activity the applications of groupware are used, which are applications that allow people linked through a network (e.g., the Internet) to share information and work cooperatively and collaboratively. Students in groupware work with other students sharing an application (e.g., Skype, text conferencing, etc.) as a part of a synchronous group project. They share an application and use real-time text communication. The groupware is for small groups of people who are to be competent users of the shared application and communication system. So it is ideal for the activity in question.

Internet-based activities incorporated in the course of English are well supported by the medium. They encourage interaction and collaboration as well as autonomous decision-making. They are sufficiently structured to allow learners to achieve objectives without floundering or getting lost. Thus, the Internet-based projects and activities can be successful when they reflect in-depth planning and integration (Warschauer, 2011).

Opportunities for online communication increase students' motivation. That is because they feel that they gain technical and language skills that will be beneficial for them in the future. The use of both traditional and electronic resources allows the students to enhance their communicative abilities both by individualising practice and by taking part in the group work online.

3 WHAT SKILLS BOTH TRADITIONAL AND E-LEARNING ARE FORMED

In the activity of preparing for the conference «Materials Review. The Latest Discoveries and Ideas Behind» the students develop sets of practical (hands-on) skills in e-learning. They are able to use communication and collaboration tools (e.g., e-mails, Skype, chat, etc.), word processing, data bases, and search engines. These skills are focused on productivity. The students learn how to use advanced features of these applications and supporting documentation.

Using the ICT they also are to have conceptual knowledge, which implies that they understand fundamental ideas connected to digital technology, e.g., network structures, how search engines work, what databases are and how they are organized and what technology can and cannot do.

My students also develop intellectual capabilities in order to deal with technological environments and applications. This means that they learn to take part in problem solving, collaborate with other students, and evaluate information and information sources.

Computer-mediated communication provides great opportunities for language teaching and learning. It shifts the focus from language form to language use in a meaningful context, and thereby increases student motivation. Long-distance exchanges make reading and writing more authentic and collaborative. Rapid written interaction helps to

achieve certain linguistic benefits, such as better opportunities to process and try out new lexical or syntactic patterns as compared to oral interaction (Warschauer, 2011).

The students write a lot. This happens when the students exchange emails, write application and invitation letters, and conference reports. They write for a real audience not just for educational purposes so their writing becomes more reader-centred. The reading skill is necessary when you browse the web and have to be able to scan a text for the key points. They write with the help of computers. So they have to employ and develop their ICT skills. They use Windows operating system or other operating systems.

The word processor is used by the students, the word processing being very helpful when you are trying to integrate several sources together. Computers can enhance all aspects of the writing process. That is because they allow easy revision, multiple drafts, and spell-checking, which can teach spelling by raising students' awareness levels (Hanson-Smith, 2011). The students also employ visual displays – slides using Power Point presentation graphics programme. All the tools offered by this programme are used: word processing, outlining, drawing, graphing, and presentation management tools. On the slides the students put the speaker's notes, the audience handouts, and the outlines.

The students form and develop some specific e-learning skills, e.g., the searching and navigation skills for the world wide web. This is a complex set of knowledge and skills, involving the understanding of different types of search engines and search techniques as well as the understanding of hypertext links and the navigation features of browsers.

In order to be a successful e-learner the students need to have a set of basic computer skills. Computers can help you to keep records, present information, and manipulate data. The ICT helps you to locate sources of information on the Internet and to communicate with teachers and other learners. A range of new web applications are becoming part of e-learning. They offer the opportunity to find content and to create it.

The Internet is an enormous information resource. When you want to find something there, you have to be able to decide if the web's content is accurate, reliable, and suitable for your purpose. So you have to develop two sets of skills: 1) searching for information, and 2) judging the quality of information. To search for information the students use search engines.

They develop different traditional language skills: 1) reading skills – the skills to acquire conceptual text structure, to highlight the primary and secondary information in the text, to integrate data, etc.; 2) listening comprehension skills and speaking skills on speciality; 3) writing skills needed to prepare reports for the conferences, abstracts of the reports and to communicate by e-mail on professional topics.

Thus, various skills both e-learning and traditional language skills are developed in the activity of preparing for a scientific conference in English.

4 CONCLUSIONS

A new learning environment has been created in the course of English for the science students in the activity of preparation for a scientific conference at the Department of Natural Sciences (DNS) of Novosibirsk State University (NSU). e-Learning is confined to formal learning here. Technology is incorporated into a traditional course of English.

In our course the teaching of language skills and new "electronic literacies" are integrated. The electronic literacies incorporated in the course are: 1) communication that allows my students to converse with each other by means of e-mail, text conferencing and Skype; 2) construction, which involves the ability to work individually and collaboratively to write and publish information on the Internet (Google Docs, Google Drive, etc.); 3) research, which involves a number of navigation, reading and interpretation skills.

The traditional language skills formed are as follows: writing, speaking, reading, listening, and translation skills.

The project is used in the course – the preparation for a scientific conference on speciality at an English lesson. It is a really authentic and challenging task for the students. Accomplishing this task the students use a lot of different electronic tools and traditional tools.

The former are such software applications as Microsoft Power Point, Microsoft Word as well as Google Drive, Google Docs suite, Skype, email, etc. The latter are textbooks, workbooks, articles, dictionaries, etc. Google Docs suite, for example, are productivity and creativity applications that allow our students create, edit, share, publish, and collaborate in the activity of preparing for the conference. They help the students to build important skills that they need, both traditional

language skills and e-learning skills. The teacher's role in this blended learning environment becomes that of guide and mentor encouraging the students to take charge of their own learning.

Being a vast resource of materials the web is widely used in the course of English. The Internet is integrated here into collaborative, content-focused project work. Technology becomes both an environment and a tool for learning. The web page *Apres*, located at the web portal of the NSU (my.nsu.ru), is a part of the blended learning environment created in the course.

In the activity of preparation for the conference the students participate in computer-supported cooperative work. Some kind of a blended learning environment has been created. Recognizing the full potential as well as the strengths and weaknesses of the blended learning in general will take time and patience.

We can only try to summarize some of the strong and weak points of this set-up as we see it. The strong points are as follows: 1) the students are exposed to an authentic activity and are provided with real opportunities to interact in the target language; 2) the interaction is carefully planned here: the interaction between the learner and the content, between the learner and the teacher, and between the learner and the other learner; 3) special care is taken of convenience, flexibility, and accessibility. The students can learn not only face-to-face in class but also any time and anywhere.

The weak points, in our opinion, are as follows: 1) the students are rather immature. They cannot cope with the demands put on them by the set-up in question. They are supposed to be self-reliant and responsible for their learning, but they are not able to. They often cannot manage their time as well; 2) the use of mother tongue during the student-student interaction or when the students work in groups; 3) the work is very demanding for the teacher because it requires a lot of planning and extra work. But then, all progress has a price and nothing comes free.

Digital information literacy skills are essential if students hope to be competitive in today's workforce. A well informed scientist who can use various information resources and evaluate they credibility serves the society in general and can push scientific progress.

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