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Profession-Oriented Blogging as the Optimal Teaching Tool for the Development of Students' Professional Language Competence

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Abstract

The relevance of the research given in this paper is due to the need for more widespread use of information and communication technologies focused on developing the university students' professional language competence as well as encouraging their independent work. The purpose of this article is to present a model and a technology of the organization of independent student work based on profession-oriented blogging in English.

A number of components of this model are described in the paper: a set of approaches (activity, learner-centred, thesaurus, qualimetric) and conditions with which the given technology must be implemented. The scientific-based structure of professional language competence is also proposed by the authors. In order to test this model and the technology based on it, two teaching experiments have been conducted where the university students were asked to keep their profession-oriented blogs in English. The results of these experiments indicate the need for the implementation of our solutions in teaching processes and stimulate students' intrinsic motivation towards the effective organization of their independent work.

Finally, the relevance of our research is discussed in the context of solving two major issues: the replication crisis and the development of artificial intelligence and machine learning.

Key words: profession-oriented blogging, professional language competence, blog, independent student work.

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Introduction

Over the last decade information and communication technologies (ICT) have been playing a major role in professional and language training, following the informatization and automatization trends in modern higher education. Thus, to reduce expenditures, a lot of attention has been paid recently to the development of massive open online courses (Kondratyev & Kuznetsova, 2014) as well as building new models and technologies that help to organize student work with ICT tools. Unfortunately, due to the decreasing quality of pedagogical studies in Russia, it is a challenge for teachers to select a well-established technology that would allow them to reach their teaching goals, whether it is to organize independent student work or develop their language skills (Feldstein, 2011).

Traditionally the main area of application for ICTs has been the development of learners' language competence. However, this does not meet the demands which today's employers place on the university graduates as it has been expressed in a number of professional standards. For example, for several engineering professions, there is a requirement of being able to analyze large amounts of data critically and write scientific and technical texts, including ones in a foreign (usually English) language. It is something that is not taken into account in a traditional foreign language training of university students (Gareyev, 2017).

On the other hand, bachelor graduates who continue their education in master's and later in PhD programs must read and write scientific papers in a foreign language. It is due to the fact that the most advanced and top-quality research is published in English in peer-reviewed journals of international databases such as Scopus and Web of Science. Unfortunately, as the experience shows, the foreign language competence alone is not enough for a graduate to take one's research to an international level and increase one's academic mobility (Shakirova, Valeeva, 2016).

A conclusion can be made that there is an urgent need for the development of a wider range of skills which include not only the foreign language competence, but also the ability to work with scientific and technical information. An attempt to describe the structure of such competence has been made by Mikhailova who introduced a concept of professional language competence (Kruchinina, Patyaeva, & Mikhailova, 2014). According to this study, this competence can be defined as an ability of a learner to use a foreign language to solve communicative problems in one's professional domain, which also contains a willingness to communicate with native speakers of this language, well-developed skills of finding and analyzing needed scientific and technical information. This definition of professional language competence will be used further in this article.

Federal state educational standards of higher education (FSSES HE) for many bachelor programs have already pointed out the necessity of developing future graduates' professional language competence. Thus, according to the latest FSSES HE (3++) for the program 11.03.03 "Construction and technology of electronic tools", which coincides with the priorities of M. T. Kalashnikov Izhevsk State Technical University (ISTU), a graduate must have skills of searching, critically analyzing and presenting information (verbally and in a written form) from different sources, including ones in a foreign language; of business communication in both verbal and written form in a foreign language; of using latest computer technologies to prepare technical design and other types of textual documentation; of time management and building and implementing one's own self-learning trajectory (Ministry of Education and Science of the Russian Federation, 2017).

Now, when the relevance of developing professional language competence is clear, the question is raised: what are the teaching tools and pedagogical technologies which are the best to solve this problem? After reviewing Russian and foreign scientific and teaching literature on developing foreign language competence in a professional domain and the use of latest ICTs as well as after conducting the experimental work on testing our hypotheses, a conclusion has been made that the optimal tool for solving this problem is profession-oriented blogging.

Purpose and objectives of the study

In this paper, the authors propose a model and a technology that both have been proven effective in their testing and can be replicated by other researchers.

Literature review

The key concept in understanding such a teaching tool as blogging is the idea of a blog. A blog is a website containing a set of regularly updated textual and/or multimedia entries, or blog posts. The main features that make a blog different from any other website are the independence of an author's view, the possibility of feedback (e.g., via the

comments feature) and hyperlinks to other resources (scientific papers, news articles, other blogs, etc.) attached to the entries which combined with other blogs form a community called blogosphere. As for the profession-oriented blogging, it will be defined as a learner's keeping a blog (in case of our research, in English) on one's professional topic.

A bulk of scientific work is devoted to the application of blogs in education, mostly to develop a foreign language competence of a learner (Pavelyeva, 2010; Sysoev, 2012; Bloch, 2007; Murray & Hourigan, 2008; Lee, 2011). However, as Rushby writes, we must take into account not only the results of the latest studies, on the use of ICTs in particular, but also the key studies from the past which might have the answers to today's challenges (Rushby & Seabrook, 2008). The literature review on the use of ICTs, blogging in particular, the development of professional language competence and the organization of independent student work has made us come to the same conclusion.

Thus, the first researchers who introduced blogs in teaching processes tested empirically the capability of blogs to develop writing and online discussion skills (Kennedy, 2003). It is worth mentioning that they were native speakers, therefore, the problem of developing a foreign language competence was not of the highest priority, as the foreign language training is most often discussed in the context of teaching English. Bartlett-Bragg (2003) was one of the first researchers who provided an algorithm for student blogging including such stages as creating a blog, commenting and reflection. Later, Bloch (2007) conducted the first teaching experiments on developing language skills and the ability to evaluate the importance of the given information with the use of blogging.

Recently, the main research area for blogging in education has been the English language training of non-native speakers. The fundamentals of blogging methodology in Russian literature have been laid by Sysoev (2012) who determined the didactic properties and functions of blogging as well as came up with the algorithm to develop writing skills in English which includes, among aforementioned stages, evaluation of students' work by teachers and students' self-assessment. Montero-Fleta and Pérez-Sabater (2010) from the Polytechnic University of Valencia have done a few studies concluding that blogging tools helped to dramatically increase learners' motivation to study English.

As a result, we can see that, despite numerous studies that use ICTs, and blogging in particular, none of them emphasizes the importance of integrating foreign language training with professional development of university students, ignoring the demands from today's employers. Moreover, thorough investigation of scientific and teaching literature demonstrates an explicit lack of research on the methods of organizing students' independent work that would help develop their foreign language competence within the context of their professional development. The latter is also a symptom of ignoring the problem, at least by Russian researchers. In most Russian universities, foreign language training for non-linguistic bachelor programs takes two years with only one classroom lesson per week. Obviously, it's far from being enough to fully develop professional language competence. Teachers have to either search for rare models of organizing independent student work in pedagogical literature or build them themselves. The model and the technology based on profession-oriented blogging proposed by the authors of this paper both address the demands from the employers with respect to high-quality training of the graduates and are focused on developing their self-learning skills.

Methodology

Before moving to the description of the structure of the professional language competence and the model focused on its development one important feature of blogging must be mentioned. Unlike many other models that use blogging as one of the elements in developing the language competence, in our study blogging is the only task (let alone the final presentation of its results) that is performed by the learner.

This decision is based on the idea mentioned by one of the greatest Soviet psychologists Lev Vygotsky in his fundamental work "Language and Thought" (Vygotsky, 1986). Describing his method of double stimulation used in one of the experiments, he points out that the task unfolds before the test subject from the very beginning and does not change throughout all the stages. Having made a task a constant and the tools to solve a problem (words-symbols) a variable, he has managed to examine all the stages of the process observing the test subject using these tools to direct one's intellectual capabilities. In our research, following the same principle and making blogging the only educational task, we could use all available tools to direct this process towards the development of professional language competence.

Structure of professional language competence

As has already been shown in many studies, blogging is an effective teaching tool for developing the students' foreign language competence. However, two other important features of this tool must be mentioned. Quitadamo and

Kurtz (2007) in their study of writing skills development found that the students who did writing assignments developed their critical thinking which includes the skills of analyzing the information, evaluating its importance in a given context and making conclusions based on this data. Furthermore, they showed that the exercises focused on developing students' writing skills also develop their conceptual thinking, i.e. the ability to manipulate abstract ideas, including professional concepts. Analyzing the results of their study, the authors come to the conclusion that through writing assignments students acquire problem-solving skills.

Given these remarks and the research on the structure of a competence, three components of the professional language competence have been revealed in our study:

1) communicative component which deals with the language skills development and the ability to understand and generate texts in English;

2) cognitive component which characterizes the ability to think critically, analyze and synthesize scientific and technical information including one in a foreign language;

3) domain-specific component which reflects how well a subject's profession-related vocabulary is formed, one's conceptual thinking and the ability to use professional vocabulary in solving communication tasks.

Profession-oriented blogging model

The full description of the model proposed is given in the previous paper of the authors (Gareev, Shikhova & Shikhov, 2018). Here, only the components of the model relevant to the context of this paper are presented.

Independent student work based on profession-oriented blogging within our model is organized with scientifically grounded methodological approaches and theories. Thus, the activity approach means full engagement of a learner when one is performing the task. The best way to understand this concept is through the phenomenon of "deliberate practice" described by Ericsson, Krampe, & Tesch-Römer (1993). The idea is that the expert performance in any task depends exclusively on the amount of one's deliberate practice, i.e. purpose-driven work and exercises which develop the skills necessary to solve the task. With respect to our research, the students are asked to compose and publish their blog posts every week as well as constantly read through and comment on others' entries.

To maintain students' motivation to perform such labour-intensive work regularly, the learner-centered approach is used. This approach implies that a learner will be intrinsically motivated to perform one's independent work only if the content and method of this work can be chosen by this learner himself. In other words, this student has absolute autonomy while constantly receiving feedback from the teacher and other students. The approach is identical to what Deci and Ryan (2004) suggested in their self-determination theory, according to which autonomy, competence and relatedness are the basic human needs that must be met in order for the students to have intrinsic motivation. In our study, we offer the students to choose the topic of their blog (either from a list or not), so that it meets two conditions: 1) it is relevant to the student's needs, goals and interests; 2) it is within the speciality and suits the requirements of one's curriculum. More than that, the students can choose the way they blog: from home or in a classroom, over the weekend or weekdays, on a website using one's personal computer or via an app on a smartphone, etc. The level of these tasks' difficulty is discussed with a teacher: these assignments, depending on the current students' level of the competence, might vary, for example, from preparing the blog post in Russian and then translating it into English to the analysis of authentic content in English with documenting it as a part of a scientific paper.

In order to systematize the professional vocabulary that is formed during profession-oriented blogging, the thesaurus approach is applied. This approach allows us to present a student's professional terminology as a thesaurus, i.e. a set of professional concepts and links between them. In particular, as a part of our teaching experiments each of the students composed a glossary of 50 professional terms used in one's blog and their definitions. Based on what terms are included in a thesaurus, a conclusion can be made about whether the blog's topic is related to the student's speciality. Also, an assessment can be made on how well the professional language competence is developed.

To assess a blog, a thesaurus and a final presentation of the student's results, the qualimetric approach is used. This approach implies the possibility of assessing such a qualitative characteristic as professional language competence in a quantitative way. The authors of this paper have developed a set of criteria with which a blog, a thesaurus and a final presentation are assessed via a method of expert group appraisal. The expert group includes the teachers and practitioners who have a sufficient level of both foreign language competence and professional competence (related to the student's speciality). Thus, some of the criteria include the regularity of publishing blog posts, lexical and grammatical correctness

of the entries, presence or absence of plagiarism and logical coherence between the ideas in a blog post. To make the assessment even more accurate, students themselves assess both their own blogs and other students' blogs.

Apart from the aforementioned approaches, the organization of independent student work based on profession-oriented blogging requires the following conditions to be satisfied:

1. Feedback must be present between a teacher and a student as a system of instant messaging, email and other means of communication allowing the learners to solve arising issues in a timely manner and the teachers to gather the data on the dynamics in the level of students' professional language competence;
2. Authentic profession-oriented teaching materials relevant to the given speciality must be used (e.g., for the students of the program 11.03.03 "Construction and technology of electronic tools" these materials would include scientific papers from IEEE journals and/or videos from Electrical Engineering section of the Khan Academy project);
3. A teacher must possess the competence in monitoring the blogging activity, so that he or she is able to provide the counselling assistance timely, regularly look through and analyze the blog posts and comments to them, test the authenticity and reliability of online resources used by the students, etc.

In order to implement the model proposed, a technology for organizing the independent student work has been developed based on this model. The algorithm of this technology implies four stages of profession-oriented blogging: preparation, composing the content for the next blog post, reflection and assessment. In a prior article by the authors, one can study the details of each stage (Gareyev, Shikhova, Shikhov, & Krasavina, 2018).

Experimental base of the research

The experimental base of the research is FSBEU HE M. T. Kalashnikov Izhevsk State Technical University.

Results

To test the model and the technology in question, two teaching experiments have been conducted. In 2016-2017 academic year, 23 second-year students who studied in the program 11.03.03 "Construction and technology of electronic tools" kept their profession-oriented blogs in English. The comparison of levels of their professional language competences (experimental group) with those of the students who performed their independent work in a traditional way (control group) has proven an explicit superiority of the former group over the latter one (Gareyev, Shikhova, & Shikhov, 2018).

In 2017-2018 academic year, another experiment has been conducted within which profession-oriented blogging was done only by the most motivated students (6 people) who, unlike others, had chosen this experimental form of independent work over the traditional one. The results of comparing the competence levels were quite similar: the experimental group was far more superior than the control one.

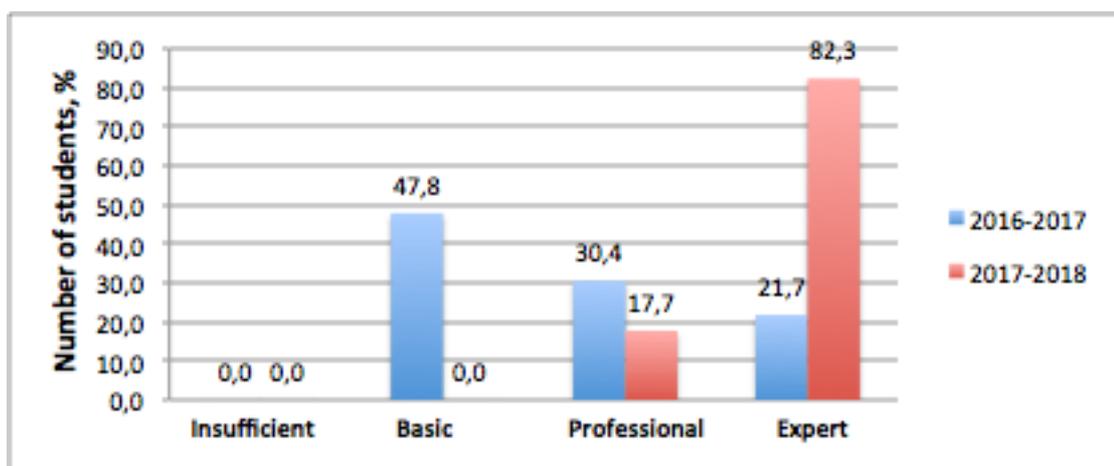


Fig. 1. Final assessments of experimental group students by the expert group in two teaching experiments (in 2016-2017 and 2017-2018 respectively) on profession-oriented blogging

However, a comparison of the results in experimental groups in both experiments might be of great interest. In the first experiment students' blogging has been a compulsory independent work, while in the second experiment the students who did the blogging volunteered to perform this work. The final assessments of students made by the expert group for both experiments, in 2016-2017 and 2017-2018 respectively, are shown in Figure 1. Despite the difference in the number of students included in the experimental groups (23 people in 2016-2017 against 6 people in 2017-2018), the results of both of these experiments imply certain conclusions.

Discussions

The results of the aforementioned experiments allow us to make the following conclusions:

- The introduction of profession-oriented blogging as independent student work leads to an increased level of professional language competence;
- The effectiveness of the process of professional language competence' development is higher when this independent work is optional and not obligatory.

This coincides with our thinking about students' intrinsic motivation which is stimulated only when they possess a certain degree of autonomy and freedom to choose the content and methods of their independent work.

Another, by no means less important, conclusion from the results of our study is that it is necessary to conduct further research in the use of ICTs, blogging in particular, to develop such complex competencies like the professional language competence. It can be claimed that at the moment, due to the lack of research on this topic, our model of implementing profession-oriented blogging is the optimal solution for the organization of university students' work. Not only does it give a visible increase in the level of students' professional language competence, but it also allows us to follow thoroughly and measure quantitatively their independent work. It is something that currently no other ICT-based model or methodology described in scientific and teaching literature can guarantee.

The model and the technology presented by the authors are just the beginning of the study of such processes as students' developing their professional language competence, and the search for more efficient ways of its development is needed.

Conclusion

To conclude, it has been shown that profession-oriented blogging as a teaching tool combined with a scientifically-based methodology of organizing students' independent work can effectively develop their professional language competence. As a result of two teaching experiments, it has become clear that profession-oriented blogging in English with all of its conditions met and principles used is the optimal solution both for learners who are intrinsically motivated to perform independent work and for teachers who are now able to measure the professional language competence of their students quantitatively.

There are also two important questions we need to cover which are especially relevant to the today's economic situation in Russia and in the world. The first question is the replication crisis of scientific findings, especially in psychological and pedagogical studies, which is now actively discussed. For various reasons, the majority of scientific papers in these areas cannot be replicated by further generations of researchers and teachers which casts doubt on the scientific rigour of this work and requires a different, more systematic approach to scientific research.

The authors would like to emphasize that the results of the study given in this paper are scientifically-based and can be empirically tested and replicated by other scholars. For example, if a teacher or a researcher has a goal of developing one's students' professional language competence, then to organize their independent work via profession-oriented blogging they need to follow the approaches and conditions on which this teaching model is based. In the course of the work itself, one has to take into account the specifics of the region and the educational institution to which the model must be adapted. One has to follow the algorithm that is implemented for the technology proposed, and also pay attention to the authors' recommendations to student profession-oriented blogging.

The second question which is worth mentioning in this paper is the rapid development of information technologies, such as artificial intelligence and machine learning. Given that mass automation and informatization gradually become the foundation of the national and global economy, it is necessary to note that the results of our research can also be viewed in this context. As all the results of our study can be replicated in different conditions, it is clear that all the actions done by people following the principles of our technology can be implemented as the steps of a

machine learning algorithm. As is well known, natural language processing is one of the priorities for the research in these state-of-the-art technologies. That is why teaching the software to "understand" and generate the texts in a natural language could complement these model and technology proposed by the authors of this research.

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