II. ИНТЕРНЕТ-ТЕХНОЛОГИИ В ОБРАЗОВАТЕЛЬНОМ ПРОСТРАНСТВЕ

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PREPARATIONS TO ORGANIZE BLOGGING-BASED INDEPENDENT WORK OF TECHNICAL UNIVERSITY STUDENTS

The latest methodology to organize students' independent work with information and communication technology is both an opportunity and a challenge for higher education owing to its current digitalization. The following article presents an algorithm which allows teachers to prepare for and organize students' independent work based on student foreign-language blogging.

Such an algorithm might be easily used and reproduced by foreign language teachers and researchers engaged in profession-oriented foreign language training of future graduates of a technical university. It includes four procedures: from analyzing the regulatory standards and identifying the objectives and methodology of organizing students' independent work, to forming an expert group and developing the quality-assurance criteria for this work's further evaluation, to finding out the structure, content and levels of professional foreign language competences to be developed, as well as its information and technical support.

The results of experimental work enable us to point out the effectiveness of the given algorithm in stimulating students' growth in the competence levels, due to its focus on students' professional development which is often a challenge to many foreign language teachers and researchers.

Key words: independent work, professional orientation, algorithm, profession-oriented blogging, technical university.

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Introduction

Due to the digitalization of higher education, the organization of students' distance independent learning becomes a crucial challenge in teaching, of foreign languages in particular. As the research findings from [Gareev et al., 2019] demonstrate, an effective tool for such purpose is a student blog, a platform for publishing text and multimedia content with its further discussion among students and other internet users via the comments section.

Despite today's students' experience with social media and blogs in their extracurricular activities, the so-called "digital natives" youth community should not be viewed as equal to the "digital learning natives" [Reid, 2018]. In other words, many learners are likely to face difficulties when adopting new digital tools, regardless of how active they are on social media and with internet browsing. Moreover, the growth in digital tools' complexity will raise the expectations around students' ability to use them. Therefore, it must be assured that learners understand how to deal with any digital instrument, otherwise some measures must be taken so that learners gain experience in

working with such software products. Thus, the organization of students' independent work based on information and communication technologies (ICTs) such as blogs requires precise algorithmization [Shamsutdinova, 2018: 103].

The objective of this paper is to make a case for the algorithm with its procedures that lays a solid foundation for the organization of independent work for students in a technical university. This independent work is aimed at developing their ability to use a foreign language in solving future professional problems, which is known as professional foreign language competence, and is based on the pre-designed model and technology both of which utilize students' profession-oriented blogging.

The objectives of the preparation stage, i.e. before the independent work is begun, were, firstly, to determine how relevant, in the context of a technical university, foreign language training is as of now, and, secondly, to lay the groundwork for the students' actual independent work which would comprise student blogging with the further discussion of students' posts, the evaluation of its results and identifying the ways to improve the quality of these results within the author's pedagogical technology. The content of key procedures of the preparation stage is presented below.

1. Determining the relevance, objectives and methods of the organization of independent work for students – future technical university bachelors to improve foreign language training

As part of the author's research, the regulatory requirements of higher education standards for a number of technical specialties relevant for Russian economy, as well as their respective professional standards for several engineering occupations have been studied. The Federal State Higher Education Standard for the training program 11.03.03 "Construction and technology of electronic tools" has been taken as an example. Also, the studies related to the issue of developing technical university learners' foreign language competence (A.A. Verbitsky, E.P. Kobeleva, Yu.V. Krasavina, V.F. Tenishcheva, V.V. Tomin and others) have been analyzed.

The results of this analysis show that the most relevant and understudied issue is that of the lack of professional orientation in current methodologies and technologies of foreign language training for future instrumentation-engineering bachelors, and, in order to improve its quality, the use of individual educational trajectories must be used [Gertsen et al., 2019]. Furthermore, it is concluded that, to enhance students' foreign language competence development, the potential of independent work with its organization being amplified by a wider use of ICTs such as profession-oriented blogging should be involved [Goltsova et al., 2020: 81].

While designing the model mentioned, it was also found that, for student blogging as part of their independent work, the most reasonable solution would be to use the methods of projects, of portfolio and of group expert evaluation; upon that, it should be supported by a set of tools which, apart from blogs themselves, include online communication tools, such as email and messengers, motivational interviewing for purposeful communication with learners [Naar et al., 2021] and instructional guidelines for blogging.

2. Preparations for pedagogical expert evaluation: forming expert groups, designing forms – for experts and for student feedback

Within this preparation procedure, expert groups must be gathered to evaluate the following:
- the integrity of the model of students' independent work organization;
- the structure, content and levels of professional language competence development in future instrumentation-engineering bachelors;
- a set of criteria based on which the results of students' independent work are afterwards assessed;
- the quality of students' profession-oriented blogs and final presentations.

The would-be experts were teachers of Russian (Kalashnikov ISTU, Udmurt State University, ITMO University in St. Petersburg) and foreign universities (Honduras, Nicaragua) and practitioners in instrumentation engineering. They had to meet certain requirements, e.g. minimum teaching

or other work experience of five years, experience in pedagogical evaluation, experience in the use of ICTs and others. The sample of experts in the research conducted is representative insofar as it consisted of both males and females, teachers of humanities and technical disciplines, with various academic degrees and without them.

All the necessary numerical values such as the size of expert group (nine people) were calculated by the formulae from [Cherepanov, 1988] according to the regulations of *qualimetric approach*.

The competence of would-be candidates was evaluated proceeding from their professional competence, i.e. in the domain of instrumentation engineering, their awareness of the requirements for future instrumentation-engineering graduates, their foreign language competence, experience in pedagogical evaluation and so forth. The qualitative values of these criteria were calculated by the *method of questionnaire data* where these criteria had to be met with documentary evidence, and by the *method of mutual recommendation* where the candidates were selected according to the number of "votes" cast for them.

The *validity* of the forms designed was calculated in accordance with the requirements of competency-based approach, has been equal to 1 and thus considered excellent. Their *reliability* varied from 0.89 to 1 which, in keeping with [Avanesov, 1989], corresponds to excellent or good reliability.

To assure the grammatical correctness and unambiguous meaning of the statements and questions in the forms, syntactic, semantic and pragmatic evaluation was conducted.

Also, when it comes to students' independent work, the feedback communication with them, apart from direct communication in classroom, must be organized in advance [Korenev, 2018: 126]. For this, the forms for both an independent student evaluation of one's blog and peer evaluation of other students' blogs have been designed in compliance with the quality criteria mentioned in the next procedure. In addition, there are forms for expressing students' opinions regarding their independent work. This surveying enables us to understand how motivated the students are for their independent work and to identify implicitly if they have any trouble with it.

Two types of forms have been made to evaluate the learners' opinions: one indicates their current experience, while the other indicates their experience after all the work is done. This separation is necessary to identify students' motivation more precisely. The two forms may differ as replaying one's experience differs from retrieving it from one's memory which corresponds to D. Kahneman's notion of experiential and remembering selves [Kahneman, 2021]. To make this survey more objective, the possibility of anonymous form filling should be introduced.

3. Pedagogical evaluation of structure, content, levels of professional foreign language competence of future technical university bachelors, and quality criteria for students' independent work

The pedagogical evaluation itself conducted after the preparation within the previous procedure resulted in the following. It was concluded that the structure of professional foreign language competence which must be developed in future instrumentation-engineering bachelors is expressed best by the three most important *components*: communicative (language skills), cognitive (abilities to comprehend, analyze and synthesize information) and domain-specific (competence in professional domain).

Then, the experts pointed out four *levels* of professional foreign language competence development:
1. threshold level at which a student could comprehend only the essence of English texts on general topics;
2. basic level at which a learner could use one's language skills to compose standardized statements on one's professional topic;
3. analytic-synthetic level at which a student could analyze complex and voluminous professional content in English and, based on it, compose scientific and technical texts;

4. predictive level at which a student could and is willing to critically evaluate complex, lengthy information in English, and on its basis compose the content with evidence-based predictions concerning the trends and future patterns of the industry under discussion, perform profession-oriented creative activity.

The quality criteria for students' independent work approved by the experts, which include language competence, logical coherence of statements, having references to the sources used, lack of plagiarism, is discussed in detail in [Gareyev, 2017].

4. Information and technical support for blogging

Before the students begin blogging in a foreign language on a professional topic, the teacher curating and organizing this independent work must, firstly, make up a list of possible blog topics for the students. For instance, the list of topics for a group of students in the aforementioned training program included, among others, the review of latest communication technologies and research into their effectiveness, the review of latest radio-engineering tools in medicine, and the development of simplified Arduino systems. At the same time, it must be noted that a student's blog topic is to suit the curriculum requirements for the discipline within which this independent work is conducted. For these requirements to be followed, one of the criteria introduced to evaluate the quality of a student blog is a topic's relevance for the given training program which is to be assessed by the expert group.

Secondly, a teacher is to compile a list of sources from which the students would receive most of the information for their blogs. Typically, these are internet sources updated regularly: scientific journals, industry-specific blogs from native speakers, theme-based news aggregators such as Hacker News from YCombinator.

Thirdly, as the author's pedagogical experiment has shown, learners might experience challenges while interacting with blog platforms. Although blogging is similar to maintaining one's profile in social media that most students have experience with, the latter has a few peculiarities: the compulsory and regular nature of post publishing, the choice of topics being restricted by a professional domain, the necessity to blog in English only. The challenges are also complemented by the lack of students' experience in writing scientific and technical texts thus far, as in most universities most of the undergraduates learn English only for the first two years of study. In the author's research, these challenges are solved by special instructional guidelines which contain frequently asked questions and standard solutions of the most common problems, as well as by the regular feedback from the teacher-curator, both remotely, online and offline, during regular classes and consultation hours.

Furthermore, technical issues are possible. These are partly solved by the requirement of the teacher-curator to have ICT competence and blogging experience, and partly by many blogging platforms, such as Wordpress, Blogger and Tumblr, being widely used. For each of these, there are discussion forums and technical support in English which both the teacher and students can refer to. However, it was shown that the most cited technical issue is losing one's login credentials with no chance of restoring. The simplest solution is to build a new website page and transfer the previously published content there which takes not more than ten minutes.

Conclusion

The results of experimental work which was conducted after the preparation procedures above and was also strictly algorithmized are described in more detail in the author's other publications. For this article, the following must be emphasized. The pedagogical experiment has shown a statistically significant growth in professional foreign language competences among the students from the experimental, "blogging" group: significantly more students (65%) were at analytic-synthetic and predictive levels of their development while the initial test showed less than 5% of them being at the former level and none at the latter. The final reviews of blogging students were mostly positive and reflected on gaining more confidence in using a foreign language, as well as the professional content in this language, more interest to explore professional topics, insights about having more control over the content being explored, comparing to, for example, a less controlled environment during their lectures [Wellman et al., 2018]. Among the typical challenges the students faced were, first of all, their own laziness, then their heavy workload with other disciplines and, as a result, the lack of time devoted to

this independent work, sometimes the lack of competence in their professional domain or of foreign language skills.

In addition, the procedures and recommendations to prepare for the organization of profession-oriented independent work for students at a technical university are especially relevant for two more reasons. Firstly, in the context of foreign language training of future technical specialists, for the first time it has been shown how such work can be organized for the purpose of future graduates' *professional development*. Unfortunately, virtually all studies concerning the use of ICTs and other ways to organize the foreign language training do not imply a foreign language teacher to be acquainted with the professional domain that is one's students' major, or at least one's interest towards it [Rezunova et al., 2018]. Secondly, the fact that the preparation for students' independent work is presented as an algorithm allows any teacher, even without any expertise in a professional domain, use the author's pedagogical model and technology by following the steps of such an algorithm. Not only does this simplify the preparation for a teacher but it also keeps the students' independent work professionally focused so that they could explore others' and publish their content in English, discuss it with each other and receive valuable feedback, from experts and outside readers.

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ПОДГОТОВИТЕЛЬНЫЕ ПРОЦЕДУРЫ К ОРГАНИЗАЦИИ САМОСТОЯТЕЛЬНОЙ РАБОТЫ СТУДЕНТОВ ТЕХНИЧЕСКОГО ВУЗА НА ОСНОВЕ ВЕДЕНИЯ БЛОГОВ

Современные методики организации самостоятельной работы студентов с использованием информационно-коммуникационных технологий являются одновременно и возможностью, и вызовом для высшего образования в связи с его текущей цифровизацией. В данной статье представлен алгоритм, который позволит преподавателям подготовиться к организации самостоятельной работы студентов на основе ведения ими блогов на иностранном языке.

Данный алгоритм может быть с легкостью использован и воспроизведен преподавателями иностранного языка и исследователями вопросов обучения иностранному, профессионально-ориентированному языку будущих выпускников технических вузов. Он включает в себя четыре процедуры: начиная с анализа нормативных документов и выявления целей и методов организации самостоятельной работы обучающихся, формирования экспертной группы и разработки критериев для последующей оценки качества этой самостоятельной работы, выявления структуры, содержания и уровней развиваемой у обучающихся профессиональной иноязычной компетенций и заканчивая их информационно-технической поддержкой.

Результаты экспериментальной работы указывают на эффективность приводимого алгоритма в активизации самостоятельной работы студентов и росте уровня их компетенции, что обосновано акцентом этой работы на профессиональном развитии обучающихся, организация которого зачастую представляет сложность для преподавателей иностранных языков и исследователей в области педагогики.

Ключевые слова: самостоятельная работа, профессиональная ориентация, алгоритм, профессионально-ориентированный блог, технический вуз.

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