Interdisciplinary Approach to Teaching ESP: Problem-Based Assignment and Students' Feedback

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ABSTRACT

The topicality of the research lies in the fact that there is some discrepancy between the demands of the technical workforce market and the pure linguistic approach ESP teachers usually take in teaching practices. Thus, language studies sometimes lack interdisciplinary issues. The aim of the research is to observe and compare the existing interdisciplinary methods and approaches, decide which of them are the most appropriate in the context of teaching ESP and assess the application of the methods in the classroom through students' feedback and teacher's observation techniques. The paper focuses on such didactic issues as teacher's participation in students' activities, students' autonomy, professional competencies development, motivation, and adequacy of language input in problem-based assignments. Except research in methodological approaches in ESP studies, the paper also presents a sociological perspective expressed as qualitative and quantitative results. The experiment on application of problem-based assignments proves their relevance to ESP studies. As a result, students' motivation and autonomy as well as professional aspects of communication are enhanced. As for language input, thematic correspondence and vocabulary extension largely improve students' subject-specific knowledge and skills. Grammar and phonetics were found to be weak points of language studies and are to be more proficiently integrated into such tasks. In general, the method of problem-based assignments described and evaluated in the article has proved its in-built interdisciplinary nature and positive impact on students' professional activities and learning strategies.

Keywords: interdisciplinary approach, ESP, innovative methods, problem-based assignments, interviews, questionnaire

INTRODUCTION

In the era of globalization, sustainability of a country's economic development largely depends on the integration skills of its specialists. It means that linguistics understood as an independent field of knowledge cannot bear the load of international communication demands. Graduates in more technical disciplines are to possess both verbal and subject-specific expertise in order to be successful on international markets. There is an opinion that "communicating information has been a perennial struggle for scientific and technical professionals. Likewise, science and technology are not the typical centers of expertise for disciplines strong in communication [1]. Moreover, W.H. Newell [2] argues that "while the notion that interdisciplinarians study complex systems tends to resonate well with natural and social scientists, it tends to sound strange (even alien) to humanists …"

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We believe that ESP studies should be assumed the kernel interdisciplinary communicative discipline as teaching professional communication to non-native speakers of a language might facilitate students' academic interaction and professional integration within wider communities.

J. Janssens [3] assumes that "when companies support the development of language skills, they want practical knowledge and understanding that can be applied immediately by their staff". He looks at the methods used by training providers and accentuates the need for communication skills on a par with some functional, interrelated social skills such as self-confidence, risk-taking, problem solving, creativity and teamwork.

The research in the interdisciplinary approach is topical. ESP teachers take familiar pains promoting collaboration between their subject and students' professional disciplines. ESP itself is at the cross border of different subject areas. Thus, developing a clear framework of collaboration with teachers in other disciplines and research in how to use existing methods to enhance students' involvement in professional foreign language acquisition are required. Moreover, the hypothesis is that increased interdiciplinarity of language studies may affect students' professional competency, i.e. motivational levels, cognitive ability, purposefulness, business skills and the gift for reflection.

Considering interdiciplinarity as a socially significant challenge, we conducted this research with the aim to investigate how innovative teaching techniques such as problem-based learning can facilitate integration of language studies within the curricula of technical subjects and find out if such integration makes students pay more attention to the development of their communicative skills in a foreign language.

LITERATURE REVIEW

The notion of interdisciplinary approach in teaching is seen as binary or even multiple perspective of two or more disciplines over a communication problem. E. A. Bushkovskaya [4] defines interdisciplinary approach as an interaction of several disciplines that can vary from simple ideological exchange to mutual integration. T. Popescu, R. Pioariu & C. Hereg [5] state: "Interdisciplinarity represents a type of approach, under different embodiments: interaction (when two or more fields interact and aim at a common objective), circulation (when a discipline uses, borrows or assimilates the concepts of another discipline), convergence (when a new discipline emerges as a result of cooperation of scientists belonging to different disciplinary fields), divergence (when differing points of view address a certain issue), and integration".

Interdisciplinary approach represents a multifaceted issue in pedagogics. Ya. A. Komenskiy's [6] philosophical idea about interrelation of human mentality and objective reality laid the theoretical basis for the interdisciplinary approach in didactics. The idea corresponds to works that are more recent where integrity of human with the world around is emphasized [7]. Dewey's pedagogical theory puts forward the idea that practical experience is more valuable in didactics than any theoretical issues [8]. Positive impact of the interdisciplinary approach in education is in the focus of research done by M. N. Berulava [9].

Scholars who research the issue of textual input in ESP studies take a more practical approach to interdiciplinarity. The key issue for textual input is authenticity of texts. "Authenticity is very significant, because it prepares the learners for the real world situations in terms of using the target language" [10]. In comparison to textbooks, authentic texts (scientific and publicists articles) are more diverse and up-to-date in the topics they cover.

Speaking about the text selection criteria, it is worth mentioning A. I. Komarova's [11] research, who clearly proved that "the combination of technical, non-technical and general vocabulary defines the functional style of speech". Thus, when choosing subject-specific texts, a teacher is to consider the frequency of terms, thematic correspondence, functionality, interlingua connections, compliance with the register of speech [12] and the criterion of conceptuality.

Scholars believe that "although students develop a moderate command of spoken English in social settings in 1 – 2 years, they need a longer time frame (i.e., 4 – 7 years) and more support to comprehend and use academic English successfully in school" [13]. The same is true for technical (subject-specific) communication.

The idea of interdiciplinarity has changed the role of the teacher. J. Janssens [3] states that the approach "where the teacher is assumed to know everything, or at least a lot about a subject, and where the pupil is ignorant or has serious gaps in his or her knowledge" has become obsolete at the age of digital information. J. Janssens suggests a different role – the role of a coach with focus on students' independent research and peer learning where the aim of a teacher is to stimulate communicative independence of his or her students. Consequently, there is more emphasis on e-learning. "The teacher has to strengthen his/her role of a facilitator, be able to encourage the students, motivate them throughout the whole duration of the course. He/she should react promptly to contributions in discussions, assess online homework, tests and do one □s best to meet students □demands. The online communication with students must be active and prompt" [14].

"Comprehensive input should be equal to output on behalf of the students [13]. In order to make students' output comprehensive, researchers in the field of ESP have developed a number of innovative methods.

"Innovative methods are methods which are based on contemporary research and information technologies that improve the quality of training students and develop their creativity and independence in decision-making" [16].

Distinguishing between active and passive types of learning, O. V. Borisova et al. [16] believe that "a student is no longer an "object" of teaching, but a "subject" of the education process. That is the active model of education, which stipulates students' self-study and encourages cognitive activity".

Application of virtual reality represents an instrument for active learning. Increasing applicability of computer-based assignments in teaching languages is vitally important as "it prepares an individual for making decisions in extreme and complex social and net-worked environments" [16]. The use of modern technology helps increase the students' motivation and interest in learning [17].

"Computer-assisted learning software, internet, multimedia, email, personal web sites are used as the technological components of interdisciplinary studies, tools for visualization and a component of the blended learning approach" [18]. "Moreover, with the development of computer technologies some tasks are carried out in automatic mode, which simplifies the process of assessment and eliminates subjective performance evaluation" [19].

The specifics of professional communication in the sphere of business stipulates oral communication as a primary skill needed from specialists. Oral communication skills are developed by practicing. Cooperative learning implies that "learning is a naturally social act in which the participants talk among themselves. In a cooperative learning, learners have the opportunity to converse with peers, present and defend ideas, exchange diverse beliefs, and question other conceptual frameworks" [20]. "Efficiency of modern technologies and methods of training will depend in many respects on the teacher's ability to solve the problem not only of creating the comfortable psychological and emotional environment for training, but also of finding optimal balance between selecting relevant professional activity of the contents and distance learning tools enabling to form competencies required for students to be competitive in the global labor market" [21].

The practical nature of interdisciplinary approach in ESP studies is expressed by the increased use of project and problem-based methods in teaching. "Project-Based Learning is one such learning which can be best implemented for students in professional courses to inculcate and develop skills like leadership, teamwork, problem solving, public speaking, interview skills, etc" [22]. "In a globalized world modern learning environment should be aimed at developing personal intellectual abilities, critical thinking skills, communication skills essential for understanding cultural diversity, cooperation with representatives of various multinational organizations" [23, 24]. "Project-Based Learning is a learner-centered interdisciplinary teaching strategy. Student-centered learning has represented both a triumph of the psychology studies and of the experimental teaching approaches on the gross economic indicator" [25].

Nevertheless, some scholars have come up with much criticism concerning the use of project-based learning method. Comparing the duration, the nature of problems and tasks, the definition of problems, the structural didactic elements of the process of work, the degree of theorization, the role of the teacher, the outcome and assessment, the researchers conclude that problem-based learning "is found to achieve better results than iPjBL (interdisciplinary project-based learning) when it comes to interdisciplinary competence. The development of interdisciplinary skills, reflective behavior, and the recognition of disciplinary perspectives is higher in iPBL (interdisciplinary problem-based learning) than in iPjBL) [26].

"The phrase "problem-based learning" reveals that this is a learning method based on solving problems. It was adopted from the field of medicine in the 1980s and was introduced into the teaching of foreign languages for specific purposes with the desire to implement a model that combines what have long been considered essential distinctive elements of languages for specific purposes: language and discipline-related knowledge" [27].
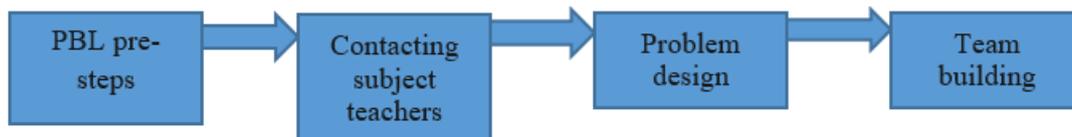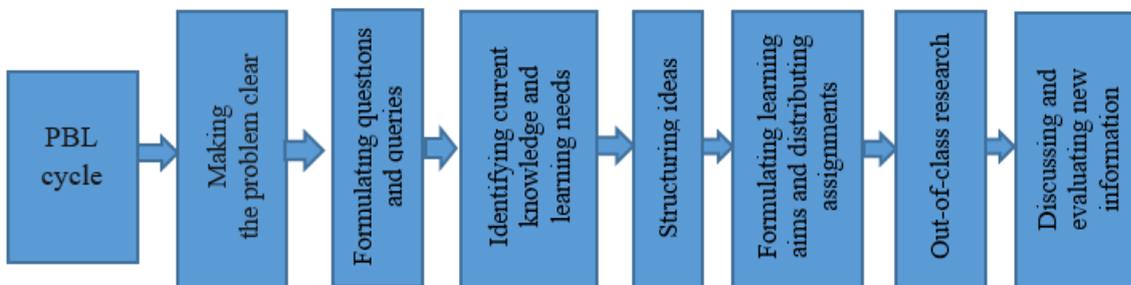
Figure 1. PBL pre-steps
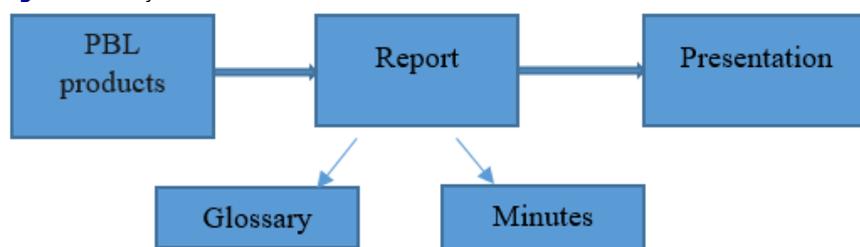

Figure 2. PBL cycle

Figure 3. PBL products

METHODOLOGICAL FRAMEWORK

The experiment discussed in this paper is based on the 7-PBL-Step model suggested by V Jurkovic [27] (see **Figure 1, 2, 3**)

Research Methods

The present research takes the deductive type of thinking. As the starting point for the experiment conducted at Financial University under the Government of the RF we used theoretical methods. By observing theoretical framework of interdisciplinary studies, using the methods of analysis, synthesis and generalization, a pattern for empirical investigations in the field is presented. We have studied the literature on the concept of interdiciplinarity, analyzed existing views on contents of an interdisciplinary input in language studies, overlooked existing methodologies such as computer-based studies, enhanced learners' autonomy, diminishing authority of a teacher in the learning process and compared innovative techniques (project and problem-based learning).

Empirical methods of research were used in order to work out a problem-based task for students of Economics. Modelling the problem for students' investigation required extensive search, brainstorming techniques, making assignments. In the process of the experiment, we practiced reflexive techniques such as testing, interviews, written feedback.

To draw conclusions on the results of the experiment we had to compile a questionnaire and employ statistical methods and methods of graphic representation of the results for visibility.

Experimental Base of the Research

The Financial University under the Government of the RF was the experimental base of the research. Bachelor-students in their 1-2 courses were chosen as a target group because English for specific purposes is something new for them (previously, at school, they were taught general English and they have no experience in integrating different disciplines into one course).

Stages of Research

The research was carried out in three stages.

At the primary, reference stage we had to analyze the theoretical and methodological database on the issue of interdiciplinarity in language studies in order to define the idea and resources for the experiment.

At the second stage, we developed problem-based assignments for the students of Economics, e.g. on the theme of Car Insurance problems in Russia. The usual period for an assignment was about 2 weeks and it required persistent monitoring of intermediate results as well as design and assessment of students' final products.

At the third stage, an analysis of the impact of the experiment on students' levels of motivation, teacher's role and sufficiency and adequacy of language input was done in order to find out how much problem-based learning techniques stimulate students' professional development and communication skills, and if any amendments to the existing framework of problem-based tasks are to be made.

RESULTS

Problem-based assignments are offered to students of Economics at Financial University under the Government of Russian Federation throughout the academic year. Such assignments are given as end-of-the-unit tasks and performed in groups of up to ten people. Bearing in mind the small amount of academic hours allocated to English lessons, we had to reduce the number of students' meeting (discussions) to just two (one per week). One of the assignments concerned the problem of Car Insurance in Russia. You see the contents of the assignment in the table below (**Table 1**). As a part of reflection activities, we conducted a series of interviews to get students' feedback and tried to investigate how much participation is required of a teacher in this type of assignments, if a teacher can really be no more than a coach for students and if students' autonomy is increased.

We compiled a questionnaire for the students who participated in problem-based assignments throughout the year. The aim was to assess how successful the method is in respect of language input students get and if the employed techniques are relevant to the demands of professional markets. We chose the form of a questionnaire as it could help us "gather large amounts of data relatively quickly", "compare the responses to particular questions from individuals or between different groups of respondents", and "the data can be expressed statistically" [28].

Students were asked a number of closed, rather simplified questions concerning their educational experience. The questions they were to answer were divided into two sections – language input and teaching techniques. Options for the answers were "yes" / "no" / "I doubt". There were 100 respondents. There were 10 questions on the list and the students were given 10 minutes to answer them.

Table 1. Contents of the Problem-Based Assignment

Steps	Purpose	Activities	Teacher's participation	Students' feedback
Step 1 Preparation of the assignment	Making the problem clear	The following idea for the assignment was suggested: Car insurance in Russia is expensive and inefficient. Car insurance policies do not reflect the degree of risk drivers are exposed to. What can be done in order to improve the price / quality ratio of insurance services?	Teacher got in touch with colleagues who specialize in insurance, formulated the problem for investigation.	In interviews, students noted that the problem is urgent. Their parents regularly come across deficiencies in car insurance politics. For some students the problem was especially interesting as they considered specialization in insurance at the further stages of their education.
Step 2 Students' meeting 1	Formulating questions and queries / Identifying current knowledge / Structuring ideas / Distributing assignments	Students brainstormed questions relevant to the problem under investigation and shared knowledge of the problem. They decided to include the following issues into research: How long is the history of car insurance? What are the obligatory and optional insurance packages in Russia and abroad? How much is the price of insurance policies across different countries? How do we calculate the price of an insurance policy in Russia? What technical innovations have insurers come up with recently? What do Russian people think about the price and quality of car insurance? Then students drew a concept map and distributed the tasks.	Teacher organized the time of the meeting, gave instructions on the use of English only, prompted students with vocabulary, took notes on their language performance, and came up with the idea to compile a glossary organized in frames representing people, risks, objects, legal acts and documents.	Students noted that the issues they brainstormed required the knowledge of different disciplines such as history, law, mathematics, technologies and sociology. That was quite challenging for them. They also noted that drawing a mind map helped them structure ideas and distribute the tasks. The tasks were distributed according to students' personal professional interests.
Step 3 Autonomic work	Individual activities and research	Out-of-class, students searched the Internet for information and compiled a digitally organized database of terms in car insurance. Any terms they came across were to be placed in certain boxes of a Google table online. Terms were grouped in frames denoting people (e.g. the insured), circumstances of risks (e.g. injury, accident), objects (e.g. anti-lock braking system), legal acts and ideas (e.g. salvage), documents (e.g. application, blue book) and financial operations (e.g. benefit, value)	No participation was required of the teacher except occasional requests from students to help translate certain terms or phrases.	Students assessed their out-of-class activities as interesting but rather hard. In fact, they had to read a great amount of authentic texts in order to obtain the necessary information. Still, compiling the glossary was a kind of competition for them – everyone wanted to invest more vocabulary into the product.
Step 4 Students' meeting 2	Discussing and evaluating information	At the consequent meeting, students made reports on their findings and had to decide how the obtained information can help them develop new policies in car insurance.	Teacher organized the time for the meeting, took notes on the students' performance, occasionally had to help with vocabulary issues, but fewer times compared with the previous meeting.	Students noted that they are much more confident in what they are saying and have fewer problems with the vocabulary they use.
Step 5 Product delivery	Sharing the results with peer-students	A petition to the government of the RF containing suggestions on what legal regulations have to be introduced was written. Students made a PP presentation about car insurance in Russia. A glossary of insurance terms was compiled and presented in class.	Teacher made comments on students' verbal performance for stages 1-7. These were comments on grammar structures, phonetics and vocabulary use.	Most students noted that writing the petition was fun. They are proud of their glossary and they believe their PP presentation was a success with other students.

Language Input

1. Vocabulary (Can the vocabulary you study in your English class be used for subject-specific communication?)
2. Grammar structures (Is the range of grammar structures you study wide enough?)
3. Phonetics (Do you focus on pronunciation when you are in the English class?)
4. Thematic compliance (Do the topics you study coincide with the themes of your specialization?) (**Figure 4**).

The results state that students' language studies are very subject-specific in respect of vocabulary and themes. Grammar and phonetics are the weak points. Indeed, English teachers at university sometimes neglect pronunciation drills and grammar exercises, taking it as something secondary to vocabulary input. Indeed, there is a range of accents recognized as a norm. Naming things in professional reality is sometimes more important than
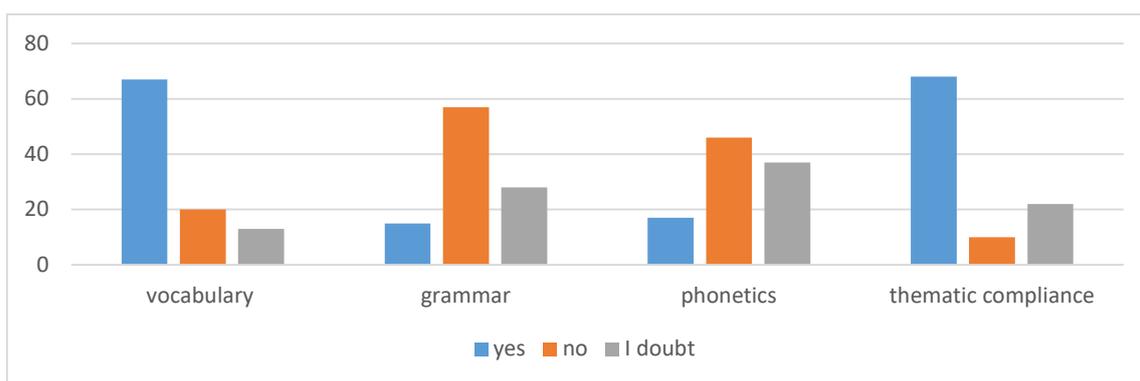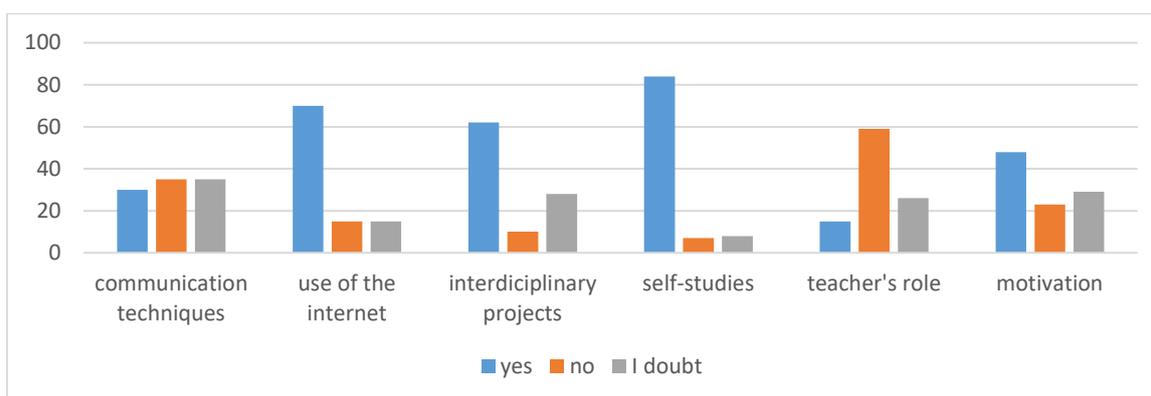
Figure 4. Language input

Figure 5. Teaching techniques

stating relations between subject-specific phenomena and more universal things like time, space or human relations. Thus, the number of grammar structures needed to deliver a subject-specific message may be small.

Teaching Techniques

1. Communication techniques (Are your communicative tasks diverse?)
2. Use of the Internet (Do you use the Internet as a resource for language studies extensively?)
3. Interdisciplinary projects (Do you often do interdisciplinary projects?)
4. Self-studies (Do you have to self-study much?)
5. Teacher's role (Do you depend on your teacher in language studies much?)
6. Motivation (Are you motivated to learn English more now than when you were at school?) (**Figure 5**).

The largest proportion of students emphasized the increase in the use of the Internet, self-studies and increased participation in interdisciplinary projects. In subsequent interviews, some students complained that in order to implement a task they have to turn to specialists for help and there are some topics, which they feel unable to speak on due to the lack of professional knowledge. In Russia, business and subject-specific English studies start in the first year of students' higher education. It means that their professional development lags in time. Sometimes English teachers have to use anticipatory techniques explaining technical issues to student before students take a course devoted to them. English teachers are not authoritative in the students' point of view and the degree of motivation is on the rise. In subsequent interviews, some students emphasized that now they know why they need to speak the language – not to pass their exams successfully, but to be able to speak with peers, teachers and colleagues.

DISCUSSION

There is some very pragmatic feature of knowledge acquisition in today's knowledge society. Some say, "the word 'learning' turns into '(l) earning' for access to the labor market. In this regard, LL is emerging as a global industry and the language of that is becoming marketed gradually such as from 'education field' to the 'learning sector', from 'student' to the 'client (l)earner', from 'diploma' to 'certificate', from 'human resource' to 'human

capital' in the EU Commission LL documents" [29]. There is no point in arguing against the fact that today's education is being transformed into a sphere of business, where the effect of the learning process is measured in terms of profits.

Interdiciplinarity is one of the key issues in providing quality educational products as integration of a specialist into international environment lays a foundation for national progress. ESP studies provide the necessary background for future specialists, make them competitive and enlarge their general communication skills.

The notion of interdisciplinary approach in teaching ESP has been researched in respect of its philosophical and practical capacity by E. A. Bushkovskaya [4], T. Popescu, R. Pioariu & C. Hereg [5], Ya. A. Komenskiy [6], M. N. Berulava [9]. Scholars' interests within the interdisciplinary approach vary from language input properties [10, 11, 12, 13, 20, 30] to the changing role of a teacher [3, 14] and further to innovative teaching methods in stimulating active learning processes [15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 28, 31, 32, 33, 34, 35].

The model of problem-based learning suggested by V. Jurkovic [27] is a practically applicable model designed to enhance students' cognitive development, motivation, professional, communicative and business skills and help them take a reflexive look at their language studies and professional achievements. Still, tasks within the model have to be developed further as students' feedback about grammar and phonetics aspects, for instance, was not positive. Supposedly, these aspects of language studies require traditional drills and exercises or are to be integrated into problem-based assignments more efficiently. Nevertheless, the continuous implementation of the problem-based model may improve didactic conditions and give way to creativity and further innovations in the field of ESP.

CONCLUSION

Reflecting on the work done, we can draw the following conclusions:

The results of the experimental problem-based assignments were expressed in terms of students' feedback (the interviews and the questionnaire). The feedback proved that problem-based assignments enhance students' motivation and autonomy, thus contributing to their professional competencies. Students stated increased volume of interdiciplinaritry in vocabulary acquisition and textual input.

Teaching techniques in problem-based assignments gives way to an increase in the use of virtual environment, autonomy and motivation. Students noted the frequency of interdisciplinary tasks. Teacher's observations and students' feedback make us think that the structural components of the professional competency such as purpose making, motivation, cognition, business activity and reflection are enhanced through problem-based tasks.

More research should be done to integrate traditional grammar and phonetics drills into the context of problem-based assignments. The properties of an English teacher's role should also be researched further.

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