Effective Integration of Distance Courses Through Project-Based Learning

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The paper aims to single out critical success factors contributing to efficient implementation of distance learning practices and to explain the role of project-based learning in ensuring effective teaching of profession-oriented foreign language in a distance format. The authors argue in favor of distance learning as a beneficial educational tool providing for the training of large groups of people regardless of the place of residence and placing a priority on students' individual capacities. Study design included a preliminary survey of 150 respondents specializing in the natural sciences and the humanities identifying the key analysis criteria, a complex of experimental online lessons incorporating project-based teaching principles, and a summarizing questionnaire verifying respondents' post-experiment outlooks. The methodology of empirical research was based on a systematic approach and deployed the methods of pedagogical observation, project-based teaching, sociological research, and statistical analysis using Neural Designer software for calculating questionnaire results. Analyzing the obtained results, the authors conclude that: 1) Students specializing in the humanities have a higher motivation to study related minor subjects; 2) interdisciplinary integration using the English language allows to achieve a cumulative effect for major and related minor subjects; 3) interdisciplinary integration based on the project method is an effective means of improving academic performance in major subjects; 4) interdisciplinary integration based on the project method makes it possible to acquaint students with the best practices in their chosen specialty; 5) project method allows to achieve related didactic goals—self-expression, independent continuous learning and the formation of professional competencies.

Keywords: distance course, distance learning, project method, project-based learning, profession-oriented foreign language, foreign language teaching

INTRODUCTION

The advanced requirements for the quality of language training have promoted changes in the methodology and medium of teaching, thus reshaping linguistic education in terms of both organization and control. One of the relatively new solutions that helps keep up with the ever-revamping standards imposed on educational services providers has to do with the introduction of online distance courses (Kaye and Rumble, 2018).

This paper addresses the problem of productive integration of distance courses in an environment of high expectations for the quality of resulting language training in today's higher educational

institutions, required to meet the needs of large population groups regardless of the place of residence, provide further professional training of academic staff, and ensure easy access to the information space for the global community.

The key objectives of the paper are to distinguish the success factors of distance learning, and to explain how project-based learning can be beneficial in ensuring successful teaching of profession-oriented foreign language in a distance format. The authors argue in favor of project-based assignments as a valuable component of distance courses, mainly because of their potential to rejuvenate the learning process, improve the end results and boost motivation to study profession-oriented foreign language.

In conclusion, the paper makes an argument for shifting the focus from exercises to the active mental activity of students taking up distance courses, which can be successfully achieved through project-based learning.

THEORETICAL BACKGROUND

Distance learning is defined as distant teacher-student interaction incorporating all the components inherent in the learning process (goals, content, methods, organizational forms, teaching aids) and implemented using specific Internet technology or other means providing interactivity (Liebowitz and Frank, 2016; Skiada, 2021). Distance learning ensures: 1) Lower cost of training (no rental and travel costs for both teachers and students, etc.); 2) reduced training time (no preparation and travel time); 3) independent planning of schedule, place and duration of classes; 4) training of a large number of people; 5) better quality of education attributable to modern tools, extensive electronic libraries, etc. being applied; 6) establishment of a unified educational environment (Ngu et al., 2021).

Distance learning also helps raise the level of education within a society, meet people's expectations regarding educational services regardless of the place of residence, upgrade the qualifications of high school teaching staff, and facilitate access to the information space for the world community.

Obviously, the success of any kind of distance learning depends on the effectiveness of teacher-student interaction. Successful distance learning practices provide for: 1) The mediated nature of telecommunication between teachers and students; 2) better opportunities for teacher-student and student-student interpersonal interaction; 3) the maximum potential for enhancing students' independent work, which is especially important in terms of university education as future specialists should be able to independently organize their cognitive activity (Wang et al., 2017).

Despite the high popularity of distance learning, not all such projects turn out effective. In teaching a profession-oriented foreign language in a distance format, what comes to the fore (along with the development of professional language competences) is the formation of the personality of a future specialist capable of self-regulation in the field of lifelong learning. This is what a student needs to be taught, while shifting the emphasis from knowledge transfer to the cognitive creative activity (Malyuga and McCarthy, 2020).

In teaching foreign language professional communication, the following integrative principles come into the picture: practice-oriented, context-based and problem-based training, orientation towards learner-centered activities, communicative-situational learning, interactivity, the balance of the conscious vs the unconscious, the principle of collective interaction/reflection. Considering this, the leading educational approaches used to implement these principles include learner-centered, communicative and competence-based approaches.

The learner-centered approach implies applying personalized solutions suited for every individual student and sensitive to their psychological and age-specific requirements, as well as the particular patterns of perception, reasoning, memory, character, temperament, inclinations and abilities.

The key purpose of the communicative approach is associated with targeted development of the communicative competence, i.e., the ability to use the language in various settings to achieve communicative goals consistent with the corresponding intentions.

Competence-based approach implies overriding orientation towards the results of education: The shaping of the required general cultural and professional competences, self-determination, socialization, promotion of individuality, and self-actualization as essential philosophies (Jaber, 2016; Xiong, 2021).

To implement these approaches, a teacher will have to supply more than just knowledge transfer but embrace the bigger perspective and unlock students' potential by applying the means most suited for an individual person involved in the learning process. While this is obviously a complex task, we believe it can be successfully addressed by introducing project work as part of distance learning activity, since project tasks add the interactive component to the learning process and, most importantly, have been found extremely productive in terms of motivation boost.

The key idea behind the project method lies in shifting the focus from exercise to the active mental activity of students, whereby the teacher acts as an assistant offering teaching methods and technologies that enable students to independently acquire knowledge of a profession-oriented foreign language while solving practical problems.

Studies have reported inspiring results showing that project tasks introduced to foreign language classes promote mastering of the communicative competence (Baş and Beyhab, 2017). For one thing, in foreign language teaching, language appears as both the goal and the means of learning and, therefore, it is constantly used by students in their project work, both for communication purposes and to create a specific activity product: Searching for information, creating texts, etc. Secondly, a prerequisite for the use of the project method is the presentation of the created product, which also takes place in a particular communicative setting (Iwamoto et al., 2016).

Project-based learning has great educational potential, as it motivates students to acquire additional knowledge, contributes to the development of social and business competencies (planning, information search, decision making, systematization, group communication, discussion,

cooperation, presentation of results, assessment, etc.). One of the main features of project-based learning lies in its orientation towards a specific practical goal—a visual presentation of the result.

An important role is given to case studies as part of the project method, since they help develop, renew, intensify and diversify communication between subjects of the educational process with its orientation towards interpersonal interaction. The project method allows students to show independence in choosing a topic, sources of information, the way it is formulated and presented, which in turn prompts increased motivation in their activity (Larmer et al., 2015; Benhima et al., 2021).

Used as part of a foreign language class, the project method provides the opportunity for students to use the language in real-life everyday situations, which noticeably contributes to better assimilation and consolidation of knowledge (Schindler and Eppler, 2003).

Foreign methodologists identify the following features that characterize the project method in teaching profession-oriented English.

The project method has practical professional orientation and a specific goal (Hugerat, 2016) contributing to students' independent activity, orientation towards a result, socially driven interaction within the educational process (Malyuga, 2016), and the realization of interdisciplinary communications in the learning process (Leat, 2017; Demirkol et al., 2021).

Adhering to the above-described principles, one of the distance courses developed at RUDN University proved a good example of a successfully integrated online resource for learning a profession-oriented foreign language. The Business English course intended for people seeking to develop their Business English skills consisted of 12 modules each divided into 12 activities, one of which incorporated a business project task to be completed by the students. The project method was implemented as part of the Case Study and employed various tasks suitable for distance learning. Notably, the course was extremely useful in that it helped include the students into the authentic communicative setting and model the real process of foreign language linguaculture experience.

A good way to establish whether particular tasks within a distance course or the course in general have been implemented successfully is to assess the learning results at two levels: The level of students' reaction to the course, and the level of actual knowledge gained upon course completion (Malyuga and Orlova, 2016). Based on survey results, students' reaction to the course revealed the average degree of satisfaction of 97,3%, while at the level of actual performance, those taking up the distance course revealed a 18,1% higher performance rate as compared to students having taken regular classes.

To prove the above theses, we carried out an empirical study based on a foreign language discipline with ingrained learning using the project method. The research goal is to identify the effectiveness of the project-based teaching method within the framework of interdisciplinary integration in the format of distance learning. The research questions under investigation is: Can a Business English course serve as an effective structural core for interdisciplinary integration when using the project-based teaching method in a distance learning environment?

MATERIALS AND METHODS

The research was conducted at Peoples' Friendship University of Russia (RUDN University) from March 4 to April 4, 2021. Study design included three stages. At the first stage, a preliminary respondent survey was developed to identify three analysis criteria: Level of learning motivation to study Business English, level of academic performance in major subjects, and level of performance in minor subjects. The three criteria were analyzed to evaluate the potency of the project method for interdisciplinary integration. At the second stage, a complex of experimental online lessons incorporating project-based teaching principles was put into practice. At the third stage, the respondents and the control group of 50 people (25 students specializing in natural sciences and 25 students specializing in the humanities) completed a summarizing questionnaire.

The project method as a key instruction tool and the basic element of inquiry for the present study was integrated in the framework of the three stages. At the first stage, the preliminary respondent survey was meant to identify participants' self-sustained evaluative assessments regarding their interest in participating in project work in English with the outgoing primary survey results later transferred from qualitative to quantitative indicators as per the three criteria to evaluate the potency of the project method for interdisciplinary integration. At the second stage, project work was integrated as a consistent key element of instruction taking up at least 30% of learning experience for the experimental groups. At the third stage, the summarizing questionnaire incorporated targeted queries aimed at illuminating the differences in opinion regarding the project method and is potential as an interdisciplinary language learning tool.

Study procedures were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Declaration of Helsinki, as revised in 2013.

Research material is represented by the content of the Business English course developed based on the corresponding academic discipline taught entirely in English. The expediency of the chosen discipline is due to the obligatory nature of a foreign language as a non-optional subject to be taken by students of all specialties. In the framework of the research, the project method was applied with students specializing in the humanities and majoring in philology, history, and political science, as well as with students specializing in the natural sciences and majoring in physics, chemistry, and mathematics. By the medium of the proposed approach, the study aims to foreshow if the project method might be considered an efficient instruction technique with respondents majoring in fundamentally different subjects.

The sampling procedure for each specialty solicited participants in their first, second and third years of study with the final sample of 150 respondents participating in the research. The respondents were divided into six groups including two designated control groups. The resulting distribution of respondents registered 75 students specializing in natural
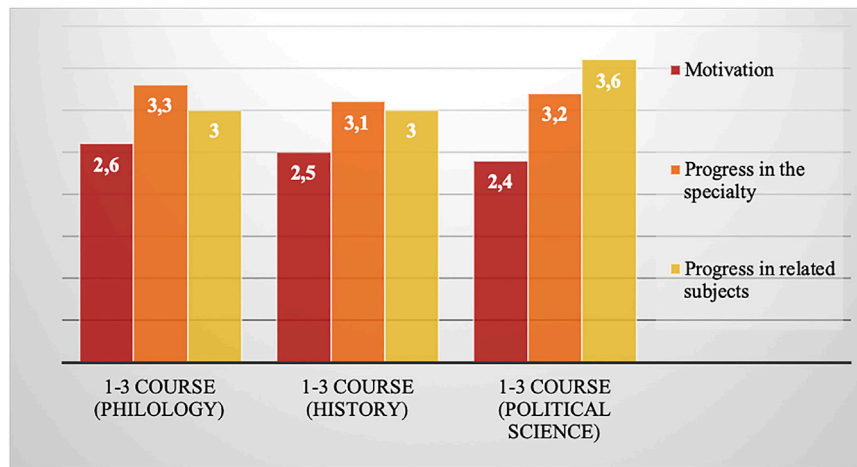
FIGURE 1 | Preliminary survey results among students specializing in the humanities (compiled using Neural Designer).

sciences and 75 students specializing in the humanities (25 representatives per each of the three majors for both specialties).

The methodology of empirical research was based on a systematic approach and deployed the methods of pedagogical observation, project-based teaching, sociological research (questionnaire survey), and statistical analysis using Neural Designer software for calculating questionnaire results. Below are examples of questions included in the questionnaire (score on a 10-point scale).

1 How do you rate your interest in learning Business English?
2 To what extent are you interested in related subjects in the process of your specialist training?
3 How good is your knowledge in related subject areas?
4 How interested are you in participating in project work in English?
5 How do you rate your academic progress in related subjects?

Questionnaire results were transferred from qualitative to quantitative indicators on a 10-point scale: 1-3 low level, 4-6 average level, and 7–10 high level for the three criteria (learning motivation, academic performance in major subjects, academic performance in minor subjects). Questionnaire analysis attributed to the first and third stages of the study relied on the evaluation of statistical data retrieved using Neural Designer, an advanced software tool for descriptive, diagnostic, predictive and prescriptive analytics. For each questionnaire, the program calculated the average score for each group (see diagrams below). The processing of the results also involved correlation analysis quantifying the relationship between the two sets of data. In our study, these are answers to the questionnaire in points and three survey criteria.

RESULTS

The primary survey results for students specializing in the humanities were transferred from qualitative to quantitative

indicators as per the three criteria (**Figure 1**), with the "learning motivation" indicator at its lowest. 73% of respondents noted that they lost interest in learning English at school, mostly due to the poor quality of teaching associated with this particular academic discipline. 67% of the students surveyed expressed "persistent aversion" to the foreign language discipline since the level of their basic knowledge was not taken into account in the process of teaching English at the university, thus leading to 82% of Elementary-level students having to study English at the Advanced level.

The three criteria did not reach the upper threshold at the average level meaning that the respondents had a low level of learning motivation to study English. With second-year students, the initial enthusiasm associated with university training declined after the first year due to the complexity of the exams. The first year of study was also associated with a lack of sustained motivation to learn English resulting from poor training at school with 90% of first-year students not speaking English above the Elementary level. Third-year students specializing in the humanities were more focused on mastering the major subjects, with 52 of 75 students claiming they were confused as to why they needed any related minor subjects at all, and 73% of respondents relating to the study of minor subjects as "a waste of time". Respondents' feedback thus illuminated a crisis in the traditional teaching system, highlighting the need for new teaching methods to be implemented within various formats of student-teacher interaction.

An even more persistent resistance to minor subjects was registered among respondents specializing in the natural sciences (**Figure 2**).

The level of learning motivation to study Business English for each of the 3 years of study remained low. The level of academic performance in major subjects was found to be slightly higher than that of students specializing in the humanities, yet this indicator for students specializing in the natural sciences still landed at the lower threshold of the average level. At the same time, 75% of respondents noted that they did not have a clear
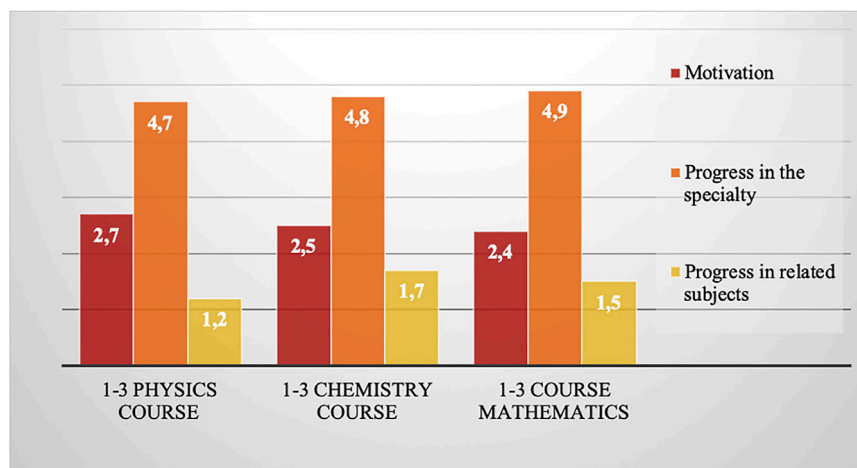
FIGURE 2 | Preliminary survey results among students specializing in the natural sciences (compiled using Neural Designer).

understanding of why they should study any related minor subjects at all. Most of the first-year physics students were outraged that they had to study philosophy and English. Chemistry students showed a slightly more loyal attitude towards minor subjects, yet this indicator was also presented at a low level. Interest in minor subjects was also low among mathematics students. At the same time, 55 students from the entire sample of 75 respondents expressed their indignation at the need to study Business English in a program not related to their majors. 89% of students specializing in the natural sciences did not understand "why they needed detailed regional knowledge about Great Britain" and were frustrated to be "constantly given texts of fiction, instead of specialized texts", with one of the comments reading: "I came to the university to study nuclear physics, not memorize pieces of texts about British cuisine and zoos".

The comments received and general statistics (**Figure 2**) show that for students specializing in the natural sciences the traditional system of teaching English, based on grammatical and regional approaches, is fundamentally unacceptable from the point of view of the formation of stable internal learning motivation. Unfortunately, traditional methods of teaching minor subjects also did not sit well with this group of respondents with the preliminary survey ultimately identifying the following teaching problems: lack of stable internal learning motivation to study Business English and related minor subjects, and low level of academic performance in minor subjects, which is also associated with the lack of motivation to study them.

To remedy the situation and evaluate the potency of the project method as a teaching aid in integrating Business English into the respondents' curriculum, the second stage of empirical work was put in place. This stage involved a series of experimental online classes using Business English for interdisciplinary integration based on a project-based teaching method. The purpose of the experimental lessons was to boost respondents' learning motivation to study Business English and improve their academic performance in both major and minor

subjects. During the experimental sessions, students worked on specialty-related projects, which also required a certain amount of knowledge in minor subjects as well. All project work was executed in English only. Following 25 classes, 18 projects in Business English were delivered by students specializing in natural sciences and the humanities of all years of study. The teaching methodology incorporated project activities with the participation of native speakers of English, virtual presentations by students prepared in English, and various types of independent work.

In general, the students showed enthusiasm in working on their projects and successfully mastered interdisciplinary connections. At the same time, students improved their knowledge of the English language, including through online communication with native speakers (using Twitter to search for the necessary information to complete the project). To identify the dynamics of changes after a series of experimental lessons, we formed a control group of 25 students who did not participate in the experimental work.

Following the online lessons, the summarizing questionaire was introduced, which results are presented in **Figures 3**, **4**.

Compared with the control group, respondents' indicators for academic performance doubled, while learning motivation to study English tripled. Students specializing in the humanities noted that they had gained an understanding as to why it was beneficial to study English—in order to be able to expand access to foreign language scientific content in their specialty. The highest result was registered among students majoring political science, who, prior to the experimental classes, did not understand the importance of learning English except as a language of international communication. In this context, project work for subject integration using a foreign language as the integrative core is more focused on the tasks facing a foreign language for special purposes (LSP). Of course, these tasks do not negate the need for students to master the common vocabulary and grammatical foundations of a foreign language. However, the special vocabulary and terminology of the topic
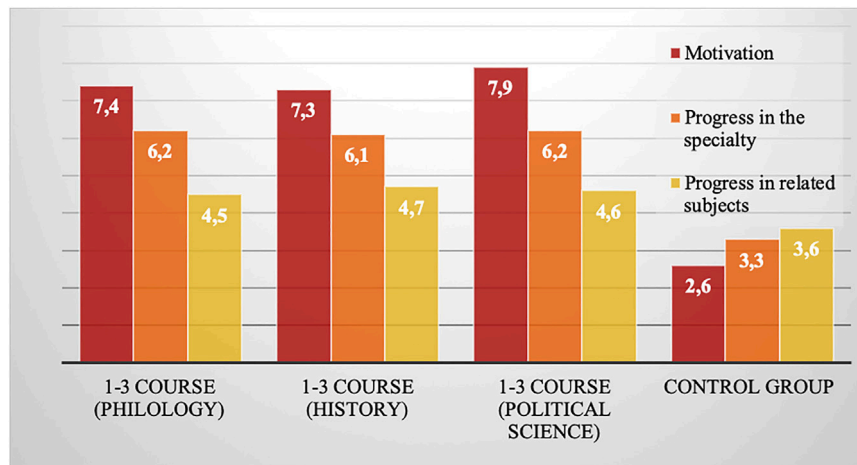
FIGURE 3 | Summarizing questionnaire results among students specializing in the humanities (compiled using Neural Designer).
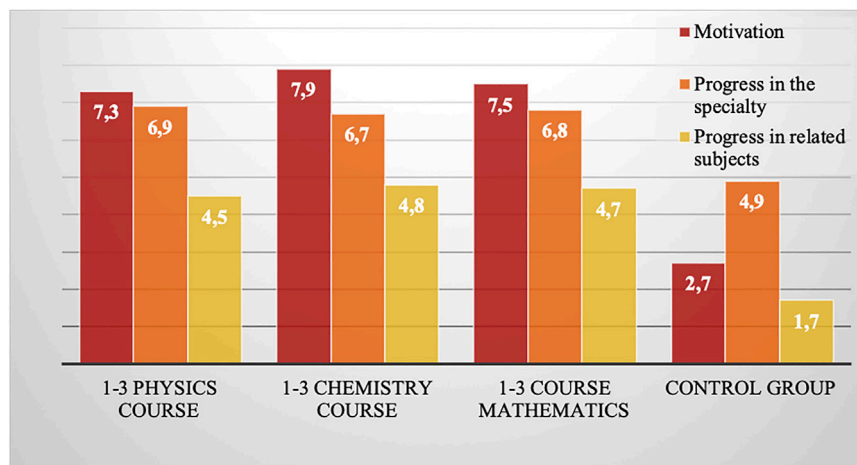

FIGURE 4 | Summarizing questionnaire results among students specializing in the natural sciences (compiled using Neural Designer).

being studied (project problems) should prevail in online learning whenever the project method is being implemented.

In the summarizing questionnaire, students also noted that they became interested in using inter-subject information, which led to an increase in academic performance: The indicator doubled compared to the control group. Particular enthusiasm to study minor subjects was noted among history students who worked effectively on projects related to the history of natural sciences. Students of philology suggested project topics and showed productive handling of both major and minor subject information. Working on their projects, students improved their knowledge of English grammar and replenished their vocabulary. The process grew more spontaneous towards its final stage as students had to communicate with native speakers on Twitter and therefore sought to write their messages competently and politely. 98% of the respondents indicated that they would like to expand the lesson plan to work with the project method.

Positive dynamics in all three criteria was also observed among students specializing in the natural sciences (**Figure 4**).

Compared to the control group, respondents' level of learning motivation to study English tripled. Such dynamics can certainly be considered a local pedagogical success. 92% of physics students noted that they needed a fundamentally new vocabulary to communicate in real time, including professional vocabulary, which they very quickly memorized and used in online communication with native speakers. Also, 82% of the surveyed chemistry students noted that learning English was "very interesting when there is a connection with the specialty and related subjects". At the same time, 78% of mathematics students were at this point eager to study English on their own in order to expand their circle of online professional communication.

For respondents specializing in both the natural sciences and the humanities, the indicator of academic performance in the
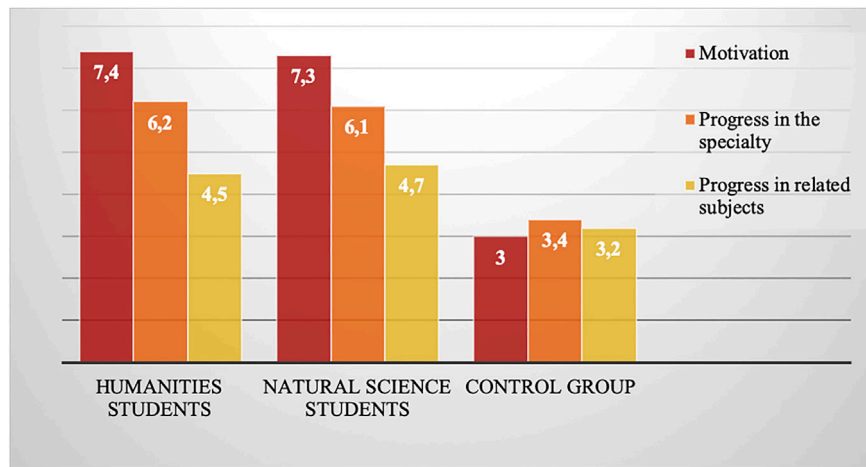
FIGURE 5 | Summarizing questionnaire results among students specializing in the natural sciences and the humanities (compiled using Neural Designer).

major subjects increased following the experimental lessons incorporating project work. To verify the obtained results, at the third stage of the study, a statistical generalization of data was implemented to provide for a visual representation of the method's effectiveness (**Figure 5**).

Thus, in the course of the empirical study, the following significant results were obtained.

1 After the experimental lessons, students' learning motivation to study Business English and related minor subjects increased significantly.
2 After the experimental lessons, students specializing in the natural sciences showed increased academic performance in major subjects.
3 As an adjacent result that was not included in the initial hypothesis of the research, the need to focus on a Business English for special purposes was identified while working on projects with the integration of a major and related minor subjects.
4 The problems of low learning motivation to study Business English and poor progress in minor subjects identified at the first stage of the study were successfully addressed.
5 Based on the results of empirical research, it is vital to introduce an integrative approach into a distance learning format, in which Business English is the core of integration.

DISCUSSION

Study results correlate with research consucted by other authors with some variations. In particular, Shin (2018) notes that the project method can be used as a tool to increase learning motivation only from the second year of university training, when students already have a general idea of the curriculum. However, the present paper has identified a positive trend in the use of project-based learning not only in the second, but also in the first year of study. Moreover, we consider it fundamentally important to apply an integrative

approach using the project method precisely in the first year of study, when the motivation to study at the university lends itself to significant correction. The present study also proved that interdisciplinary integration implemented using the project method shows its effectiveness regardless of the course and specialty of training. This result is especially important in the light of the discussion reflected in modern studies about which specialties the project method is most effective for, with some studies prioritizing humanitarian specialties (Wang et al., 2017), and others arguing in favor of the natural sciences (Hafeez, 2021).

Study results confirm the theoretical theses outlined in the work in Pokhodze (2019) who believes that the English language is an effective tool for subject integration, since it allows the teacher to achieve the maximum level of students' motivation to study not only a foreign language, but also the specialty in which the project work is carried out.

The obtained results partly confirm the theses suggested by some researchers:

1) students specializing in the humanities have a higher motivation to study related minor subjects than students specializing in the natural sciences (Shachkova et al., 2020);
2) interdisciplinary integration using the English language allows to achieve a cumulative effect for major and related minor subjects (Suyunova and Suyunov, 2021);
3) interdisciplinary integration based on the project method is an effective means of improving academic performance in major subjects, since it allows to significantly expand students' scientific outlook (Demirel and Coşkun, 2010);
4) interdisciplinary integration based on the project method makes it possible to acquaint students with the best practices in their chosen specialty (Malyuga and Tomalin, 2017);
5) project method allows to achieve related didactic goals—self-expression, independent continuous learning and the formation of professional competencies (Xiong and Zhu, 2017; Makeeva et al., 2020).

The results of the empirical research will also be confirmed at the methodological level in the work by Alizade (2019), devoted to the development of specific models of distance learning, including using the project method when integrating subjects using a foreign language.

Research results also confirm the thesis proposed by Feld (2021), who presumes that the project method of interdisciplinary integration based on a foreign language allows the teacher to create an optimal pedagogical environment in the format of distance learning. This thesis is also supported by some researchers who study the theoretical foundations of the project method application in the conditions of distance learning (Spikol et al., 2018; Dvorianchykova et al., 2021). Some researchers also write about the need for a wider implementation of the project method for interdisciplinary integration in the distance learning format, arguing that within the framework of project activities it is possible to achieve the formation of students' professional competencies (Hanif et al., 2019; Ávila-Cabrera and Esteban, 2021). At the same time, some researchers note the need to create an effective teacher-student communication system for the implementation of project activities in a distant format (MacLeod and Veen, 2020; Shumeiko and Nypadymka, 2021). For this purpose, some researchers propose to use digital technologies more widely (Revelle et al., 2020).

In general, the issue raised in this study is being quite vigorously discussed within the research community, and the results proposed herein can be useful in that they elaborate on the existing knowledge in this field and expand the boundaries of this discussion.

CONCLUSION

This paper set out to distinguish the success factors of distance learning, and to explain how project-based learning can be beneficial in ensuring successful teaching of profession-oriented foreign language in a distance format. We argued that the success of any kind of distance learning depends on the effectiveness of teacher-student interaction, whereby the competence-based learner-centered approach comes to the fore and knowledge transfer is perceived as of subordinate priority.

We suggested that this «definition» of success correlates perfectly with the potential of project-based learning that changes the role of the teacher to meet the needs of large population groups regardless of the place of residence. The key goal here is not to just transfer specific knowledge, but to impart the skills of knowledge acquisition in order to activate every student's performance, set the scene for creative activity, and synergize the acquired knowledge and skills.

We also argued that since teaching of a profession-oriented foreign language relies heavily on the learner-centered, communicative and competence-based approaches, the project method can be viewed as one of the best fitted solutions helping the students use the language in real-life everyday situations, thus helping assure better assimilation and consolidation of knowledge in distance learning.

In conclusion, we can note that the results obtained by us in the course of empirical research allow to expand the scope of the project method in a distance format in order to implement an integrative approach for teaching students in both the humanities and natural sciences. At the same time, the scientific novelty of the results lies in the fact that they prove the effectiveness of the integration based on the English language. The theoretical significance of the study lies in the fact that the results obtained expand the field of distance learning. The research practical significance lies in the fact that the presented methodology for assessing the project method effectiveness in distance learning is applicable to a wide range of respondents from different courses and different specialties.

Along with obvious advantages, project-based learning as part of distance training can sometimes pose a challenge due to insufficient level of language training of individual students, lack of awareness, or technological issues, which is why further integration of the project method in the framework of distance learning will require both stuff training and continued familiarization of students with the peculiarities of this kind of learning activity.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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