







Collaborative Writing as an Effective Tool in Teaching Foreign Language Oriented to the Vocational Education of Engineering Students

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Abstract. Education for sustainable development requires the search for advanced *teaching* and learning *methods* that motivate and empower students to acquire the knowledge and skills to shape their future. Cooperative learning is one of the most effective methods in terms of involving learners working together on diverse activities. Teaching professionally-oriented foreign languages at engineering universities makes students move toward *better writing by putting* higher requirements on the writing skills needed for their future employment and career advancement. Thus, the presented paper is aimed at analyzing the theoretical aspects and practical applications of collaborative writing as a powerful tool for creating a more *effective learning* environment. The paper defines the concept, key principles, stages of implementation, as well as advantages and potential of collaborative writing. Besides, it highlights the opportunities and challenges of digital platforms in providing the technology of collaborative writing. It also contains the results of a survey that confirmed the effectiveness of collaborative writing in teaching a professionally-oriented foreign language. The findings of our study might be useful for both *education theorists and practitioners*. To further our research, we are planning to analyze the use of collaborative writing technology, expand its possibilities, and enhance the efficiency of its application.

Keywords: Education for sustainable development · Engineering · Cooperative learning · Teaching professionally-oriented language · Foreign languages · Collaborative writing · Collaborative Web technologies

1 Introduction

The onset of digitalization has initiated a new era that has an enormous impact on all spheres of life, including education. The changes taking place in up-to-date society enable teachers to develop new methodological approaches and technologies oriented towards effecting positive transformations in the teaching-learning process. Indeed, sustainable development is directly related to education, which is viewed as its most essential

tool. These days, vocational education is targeted at forming knowledge, skills, and abilities that an individual needs to succeed in a future profession, as well as at developing abilities to act successfully in a fast-moving and rapidly changing society. As stated by Marunovich et al. [1], the use of digital technologies at engineering universities has the potential to improve the quality of education by increasing student-teacher interaction and facilitating the formation of core competencies.

However, the digitalization of education requires the fundamental reorganization of the educational process and the formation of new learning competencies. Alongside professional competence, the list of requirements for young professionals includes good communication and teamwork skills, mobility, flexibility, purposefulness, and decision-making skills. We think that the major problems faced by 21st-century education (continuity of learning, shift from obtaining knowledge to developing professional skills, preparing specialists with design thinking, ability to filter information, etc.) can be solved only by applying advanced learning technologies, which encourages the academic staff to look for new teaching methods and technologies.

Building and developing an innovative educational environment at a technical university is facilitated by cooperative learning (hereafter CL) or learning in cooperation. CL is interpreted as a set of methods and techniques used in a certain logical sequence. A recent review of the literature on this topic found that this learning system is effective in teaching various subject areas and diverse types of foreign language speech activities [2]. Since cooperative learning is referred to as the communicative language teaching method, it is extensively used in foreign language teaching at high schools.

The strong points of the given method are as follows: the students' independence in searching and selecting the required information, developing communication skills to solve a common problem, as well as critical thinking, creativity, and sense of purpose. The tasks developed by teachers can incorporate any kind of project, simulation, role-playing game, mind maps, etc. An increasing number of studies have proved that the aforementioned techniques make it possible to engage students in group work both inside and outside of the classroom in order to achieve the common goal, and, thus, to foster the skills that students need for career success [3–6].

At the same time, here are some weaknesses of the practical application of the presented technique. Li & Zhu [7] point out that some students strive for individual work during the project, they refuse to work with peers in a small group, as they do not like their text to be corrected by someone else except the teacher. Carrier & Nye [8] draw attention to the large labor inputs while preparing for fulfilling this type of activity. Since cooperative learning is a relatively new technique in teaching foreign languages, it requires a more detailed development of its theoretical foundations based on the practical experience of educators worldwide.

There is a considerable amount of literature on the issues related to teaching such types of speech activities like reading, speaking, and listening [2, 9]. Unfortunately, writing is a less repetitive activity in a foreign language class. However, the main professional competencies, which a future professional should have, include the skill to read authentic texts in a foreign language, business writing skills, the ability to understand and draw up technical documentation in a foreign language, to analyze written information, to draft reports, press releases, reviews, etc.

The rapid development of high-technology industries places a lot of emphasis on employees' skills, abilities, and knowledge. Today, engineers should have good writing skills that mean to be able to tailor a written message for the audience. The aforementioned factors result in the urgent necessity of finding new methods and technologies to teach writing outcomes. Considered as a technology for teaching writing, collaborative writing (henceforth CW) will undoubtedly contribute to the achievement of those goals. Currently, many studies have been published on the possibilities of exploiting social software like collaborative online editors to promote cooperative learning in a foreign language class [10–12]. However, to the best of our knowledge, there is no experimentally tested technology for teaching creative collaborative writing in professionally-oriented foreign language education. Thus, the leading cause of the given study is to investigate, analyze, systematize, describe, and test this learning technology.

The study is aimed at examining both the theoretical and practical aspects of CW design and application.

To achieve this goal, it was necessary to solve the following tasks:

- to define the concept of collaborative writing technology;
- to single out the principles of creating original written content by implementing collaborative writing technology;
- to analyze the advantages and potency of collaborative writing compared to traditional methods of teaching writing skills;
- to scrutinize the opportunities of online digital editors as a digital collaborative tool for teaching writing;
- to survey students to capture their feedback on CW use in foreign language class.

The research question is as follows:

- How has the CW technology affected the process of vocational foreign language teaching of engineering students?

The paper includes the introduction, description of the experimental method, results, discussion, and conclusion sections.

2 Materials and Methods

The research question presented in the Introduction can be solved by an array of the following theoretical methods:

- analysis, systematization, and description of data outlined in the literature in the field of teaching foreign language written speech to form professional foreign language skills and competencies;
- theoretical modeling of the CW learning technology and grounding the possibility of its implementation in the educational process.

The empirical part of the research involves the experimental application of the CW technology into the learning environment of Rostov State Transport University. The

experiment was followed by a survey conducted among the students of the experimental groups to define the effectiveness of the given technology, as well as to find out the students' preferences of teaching methods. Quantitative data processing and analysis methods were employed to make the corresponding calculations and interpret the data obtained, respectively.

The implementation of educational technology into classroom instruction was carried out during the 2020/2021 academic year. The sample was composed of 60s-year students divided into five experimental groups. Foreign language lessons were delivered in accordance with the university curriculum. Prior, when teaching writing skills, we generally used traditional learning methods. During three terms (Winter 2020, Summer 2021, and Winter 2021), we offered students a new strategy for learning writing skills, which implied analysis and processing of professionally-oriented texts. It means that experts have some experience in applying the CW technology in educational activities.

The research hypothesis is as follows: the use of interactive CW technology based on digital online editors helps to boost the learners' motivation, improve the quality of professional education, and dramatically promote the formation of writing skills. The survey was conducted on December 15, 2021. The criteria presented in the questionnaire correspond to the key features of the CW technology. The participants were asked to express their positive, negative or neutral attitude on 10 points that characterize the given methodology.

3 Results

A recent review of the literature found that the response to the grand challenges impacting modern society requires the creation of a new educational model providing innovative foreign language teaching and development of new methods and technologies in higher education [3, 8, 9, 13].

Cooperative learning or learning in cooperation is viewed as a learning technology that includes a set of methods and techniques used in a certain sequence to solve the learning task. The key advantage of the given technology is active students' interaction, which helps them maximize communication skills. At the same time, students learn to work in groups, i.e. in a small team; they are constantly involved in the educational process. Besides, it ensures that students can function independently since they plan, organize, and control learning activities. In addition, CL encourages students to speak a foreign language, when discussing a topic, expressing opinions, requesting, agreeing, or disagreeing with peers [8, 9, 13]. Carrier & Nye [8] underline that a teacher acts as an organizer of students' independent work, though actively participating in students' creative activities.

Robert Slavin, Elliot Aronson, Roger Johnson, and David Johnson were among the first to describe this technology, its advantages, and key characteristics. The development of interest, critical thinking, increasing students' motivation, the ability to apply productive skills in real-life situations are based on five CL interrelated principles, whose successful implementation results in building a learning environment and establishing effective cooperation and communication in a foreign language classroom [13].

The application of the aforementioned CL principles in teaching professionally-oriented written speech provides an opportunity to form collaborative writing technology. Figure 1 illustrates the CL principles.

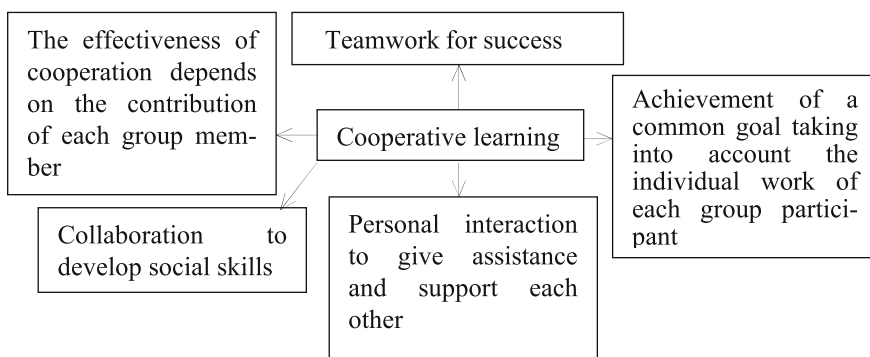


Fig. 1. Illustrates the CL principles.

Collaborative writing technology is a set of methods and techniques that

- involve teamwork in groups to achieve success;
- are used to teach writing skills and create written content;
- contribute to the development of communication skills in a foreign language;
- strengthen students' social skills through personal interaction.

The CW technology usually includes five main stages of implementation. The description of each stage is detailed in numerous publications on foreign language teaching [13–17]. Particular emphasis is placed on the work organization process since cooperation and creation of a written product is impossible without actual vocabulary or patterns of grammatical usage. The CW technology is realized by

- creating a common written text after in-group discussion;
- sequential writing of separate parts of the text by each member of the group;
- parallel recording of separate sections, which later will be compiled into a single text [14]. The stages of the CW technology implementation are shown in Fig. 2.

Due to the development of next-generation digital technologies, when introducing the CW, educators can turn to Web 2.0 resources like Google Docs, Facebook, Wiki, and WordPress Blog. At the same time, students have the opportunity to quickly exchange their unique texts or correct them both inside and outside the classroom from home PCs. For instance, Merse & Schmidt point out the advantages of the virtual Writing Pads, which allows users to create and edit the text remotely, discuss the written content, and supervise each participant's contribution. The teacher can use their expertise to monitor the learning process and give direction to group members [18].

The CW technology can be supported by blogs of social networks, whose effectiveness at cooperative learning has been studied by many authors [10, 11, 19, 20]. Blogs are

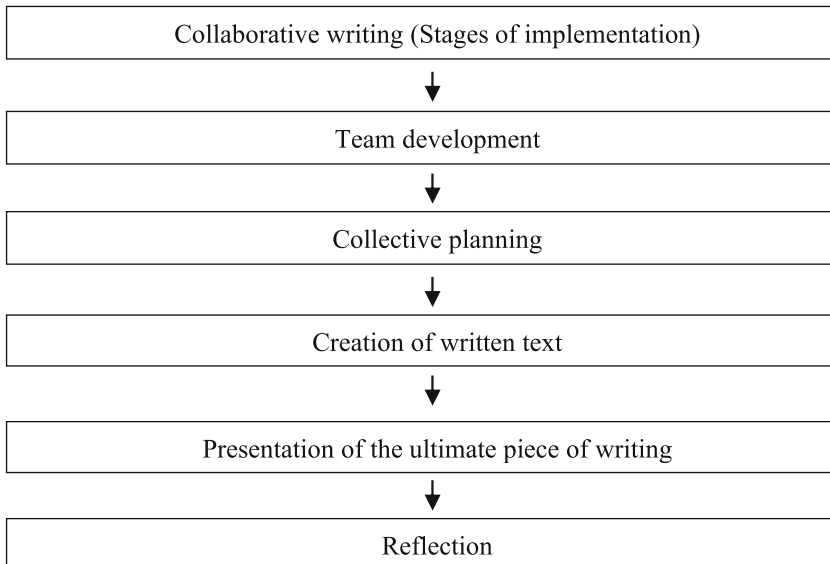


Fig. 2. Stages of the CW technology implementation.

often used for asynchronous written interaction among students in foreign languages. The functions of blogs much resemble those of other online text editors. The 4 major functions they serve are commenting, sharing ideas, learning, and discussing. The blog can be owned by an individual or an entire group. As an individual user, the student is aware of their belonging to the team, but at the same time, they are aware of the personal autonomy that leads to the education customization.

With at least two billion active users, Facebook is the most popular social network. Alongside its well-known functions (creating a personal account, sending and receiving messages, writing on whiteboards, sharing photos, etc.), some advantages are worth noting as well. First, digital communication is limited neither by time nor users' whereabouts, so they can continue their activities any time they want. Second, its news feed and chat contribute to persons' participation in multilingual communities [20–22].

The most in-demand Web 2.0 technology is Wiki targeted at creating, adding, editing, and publishing content, inserting media files and hyperlinks. The given technology makes it possible to create presentations, encyclopedias, group portfolios, etc. It should be mentioned that Wiki-platforms are effectively utilized for teaching written professional communication skills, for instance, for summarizing technical texts, reviewing academic papers, dwarfing technical documentation and manuals, writing business letters. Wang argues that due to the plethora of functions, Wiki is a potent teaching and learning tool to promote the learning process in higher education [23]. King draws attention to the benefits of Wiki technology for creating Wikipedia by second-language students [24].

The implementation of Wiki-based CW technology into the professional education of engineering students has proved its effectiveness. Among the positive aspects of using digital technologies in the professionally-oriented learning process are:

- students' are deeply engaged in intercultural interaction with users from all over the world [20], thus mastering their foreign language writing and reading skills;
- frequent use of Web-technologies helps to increase student's digital literacy;
- multifaceted learning environment encourages students to take on different roles and participate in a variety of writing activities to enhance their writing competence;
- numerous practical functions of Web-technologies make the process of creating collectively written content be more communicative, cooperative, and inspired [20].

The empirical support of the presented theoretical foundations implied conducting a survey. The sample consisted of 60 respondents, who attended our foreign language classes during the 2020/2021 academic year. The survey was carried out on December 15, 2021. Respondents had to express their attitude to CW-based lessons by placing a + sign in the appropriate column. Table 1 summarizes the data obtained.

4 Discussion

Of the study population, all subjects completed and returned the questionnaire. The overwhelming majority of those surveyed highly appreciated the CW technology offered to them. The highest score (100%) was obtained for Criterion 1 (Clarity of the task statement and the task itself), as well as Criterion 10 (Effectiveness of the teamwork organization). Criterion 7 indicates the students' interest in new, interactive technology. Evaluations of Criteria 2, 3, 4, 5 range from 78% to 95%. It can be explained by the fact that the specifics of CL are not sufficiently mastered by learners. Each individual in the group has personal values, beliefs, traits of character, etc., which should be subordinated to the interests of the entire group to foster social skills, including teamwork skills. However, personal differences often lead to conflicts, tension, animosity, or unwillingness to cooperate with some team members or to work in a team in general. In addition, some students tend to work on assignments by themselves since they don't view peers as trustworthy. Such students protest against editing their texts by someone else, demonstrate a desire to exercise their responsibility, and refuse to be in charge of collective content.

Criterion 6 (Satisfaction with the digital platform) has the smallest percentage of positive assessments (70%). It can be explained by slow Internet connection, out-of-date computers, and poor digital literacy skills.

As for Criterion 8 (Development of foreign language written skills), the respondents evaluated it 74%, 16%, and 10%, respectively. Criterion 9 manifested the student's self-assessment of their engagement in teamwork. We note from Table 1 that learners rated their writing skills quite highly. The validity of these estimates can be verified by the teacher only.

As hypothesized, the survey shows that Web-based CW learning technology assists in increasing students' motivation and quality of learning, forming core foreign language skills and competencies.

Our findings support previous research in this area. The repetitive use of CL technology significantly saves time required to master a certain topic, encourages students to learn foreign languages, and helps to overcome the language barrier. Being the main participants in the learning process, students improve personal interaction and social skills, as well as learn to set goals correctly, prioritize tasks, and plan ahead [9, 13–16].

Table 1. Evaluation of collaborative writing technology.

№	Criteria to assess	Positive assessment, %	Neutral assessment, %	Negative assessment, %
1	Clarity of the task statement and the task itself	100	0	0
2	Fair group division	95	0	5
3	Activity of each group member	80	20	0
4	Fair assessment of each member's engagement (by other learners)	75	0	25
5	Evaluation of interaction in creating the final text	78	12	10
6	Satisfaction with the digital platform	70	0	30
7	Development of interest and motivation for learning a foreign language	100	0	0
8	Development of foreign language written skills	74	16	10
9	Self-assessment of own engagement into the teamwork	90	10	0
10	Effectiveness of the teamwork organization (based on the assessment of the final written content)	100	0	0

The effectiveness of learning in cooperation contributes to an increase in the academic achievement level compared to individual learning and learning in competitive conditions, as it is aimed at long-term memorization and depth of understanding of the learning material [20, 21, 24]. As reported by Kolmakova et al., collective educational activities establish positive and healthy student relationships and develop compassion, mutual assistance, and solidarity [25].

Many studies have been published on the advantages of cooperative teaching methods [3–5, 12]. Our findings will add to a growing body of literature on introducing collaborative writing technology into the foreign language course of technical universities. A comparative analysis of two learning technologies is presented in Table 2. It should be noted that since the collaborative writing technology is based on the principles of cooperative learning, it has the same advantages over traditional teaching writing methods.

Table 2. Traditional method and cooperative learning in foreign language teaching: comparative aspect.

Criteria of comparison	Traditional method	Cooperative learning
Student's role	Passive learner	Active autonomous learner
Teacher's role	Key person of the learning process. Functions: to control the pace and direction of learning, to correct students' mistakes, the main source of help and support	Organizer and counselor of group work, facilitator of communication tasks, intermediary for teaching cooperation skills
Learning material	A complete set of learning materials for each student	Learning materials are arranged according to the objective of the lesson. Group members choose the necessary learning materials, exchange them
Types of activity	Learning vocabulary, practicing to use speech patterns and even sentences, translating, listening, compiling own written texts	Any type of learning activity (predominantly group work) aimed at involving students in communication, information exchange, discussing, planning, and working on creating the final written content
Interpersonal interaction	Rare communication between students. Regular interaction between the teacher and students	Active interaction between students, irregular interaction between teacher and students
Location in the classroom	Students sit separately or in pairs in the classroom	Small groups sit around a round table
Students' expectations	Active participation in assessing own knowledge and the quality of the task performed	All learners contribute to the group success
Teacher-student relationship	Teacher-student relationship. Supervision	Equal participation in the learning process

5 Conclusion

The evidence from this study suggests that the challenges of modern society have made the educational community adopt new, effective teaching technologies. We strongly believe that preparing high-class engineers at technical universities should be grounded on digital technologies.

Our research underlined the importance of collaborative writing technology, which we used to teach our students a professionally-oriented foreign language. We have obtained comprehensive results showing that it can be applied in teaching other academic disciplines.

Collaborative writing is a collective effort to create written content based on real-time communication on digital platforms. The advantages of the given technology are the possibility of constant students' participation in the communication, correction, and refinement of written texts, development of personal writing strategies, descriptions of situations related to professional activities, increasing media literacy by digital learning. However, students' traits and values, their desire to work in a team greatly affect success in achieving a common goal. The aforementioned factors should be taken into account when planning, designing, and developing tasks for teaching writing skills in a foreign language classroom.

Besides, we have analyzed challenges in the CW technology application. Difficulties in online platforms usage, lack of regular access to the Internet, students' low level of foreign language proficiency can reduce the effectiveness of CW technology implementation.

This study is the first step towards more active exploitation of CW technology in teaching professional foreign language writing skills. Future work will concentrate on improving CW methodological techniques to streamline the learning process.

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