

Rationale for a Conceptual Model of Teaching English for Special Purposes

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Abstract—Teachers' professional and personal qualities and the latest information and communication technologies combined with student-centered teaching methods are the prerequisites for effective English language teaching. The study's objective is to design a conceptual model of active English language learning to be implemented in the course of professional training for technical specialists in academic settings. The conceptual model for teaching English for special purposes has been designed based on the descriptive method, scientific literature data analysis, and theoretical modelling technique. The method of expert evaluations was used to identify professionally significant research areas. Specific features of intensive learning technologies, which can be effectively combined in the learning process, have been identified. A modern interpretation of active learning in English as a generalized conceptual model of learning is presented. The established combination of intensive teaching methods and technologies can be used to teach English for Special Purposes at technical universities.

Index Terms—conceptual teaching model, active teaching methods, modern educational technologies, future civil engineers, active learning methods

I. INTRODUCTION

The professional and personal qualities of the academic staff, student-centered instruction methods, and economic and socio-cultural factors are the prerequisites for effective English language teaching. Traditionally, deep expertise and skills in mastering the English language used to be achieved primarily through a long stay of a student in the language environment. Now advanced teaching methods and aids contribute greatly both to students' motivation and their effective language instruction (Ozoda et al., 2021). The contemporary information and communication technologies implemented into an academic process at universities, in particular, the widespread open online courses for engineering students, create ample opportunities for students to gain professional language competence (Aitenova et al., 2019; Zubkov, 2020). Therefore, an important research topic today refers to the creation of a conducive didactic and psychological atmosphere of the academic process, which would help instructors develop students' intellectual, social, and communication skills effectively, stimulate their interest in learning, creative activity, and independence in gaining knowledge, acquiring language skills, as well as shape the future specialists' ability to predict a professional situation and make their own decisions. Thus, the relevance of this study is predetermined by the necessity to improve the effectiveness of teaching English for special purposes.

The objective of the study is to develop a conceptual model of active learning of English for special purposes in the professional training of technical specialists in academic settings.

Research tasks:

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1. To review the scientific literature data on the latest educational technologies for teaching English for special purposes.
2. To identify specific methods and technologies of active learning that can be integrated into the process of language instruction for future civil engineers based on the model of active learning in English.
3. To develop a conceptual model of active teaching of English for special purposes.

The scientific novelty of the study is that modern methods and technologies for teaching English for special purposes have been offered as a conceptual model for the first time, which will improve the effectiveness of language instruction for future civil engineers.

II. LITERATURE REVIEW

Nicol et al. (2018) and Zepke (2013) consider active learning as an umbrella term covering a variety of teaching techniques designed to engage students in learning as well as to enhance and maintain their motivation. The global best practices of instruction in academic settings are marked by the integration of various technologies, approaches, and methods (Chernysh et al., 2020). Students' complex experiences and their leading representational systems of perception are the core components of their intrinsic motivation, which must be taken into account when they learn new professional materials (Rubtsova, 2019).

Teaching English is a priority area of modern higher professional education, the knowledge of which is a key to specialists' competence. In this regard, the task of an instructor is to encourage the students' creative activity and spark their abilities through innovative forms of education by using communication-oriented digital technologies and online resources (Yuldasheva & Aminova, 2020). Matkasimova and Makhmudov (2020) refer to interactive and information and communication approaches based on digitalized education as one of the most promising evidence-based methodological approaches to teaching English. Discussions, email projects, web quest technologies, and Skype technologies are considered methods (Yuldasheva & Aminova, 2020). For the development of listening and speaking skills, it is proposed to use, in particular, individual modes and group activity, as well as case technologies, which enable students to make a situational analysis of speech activity. The introduction of innovations in teaching English also sets out new requirements for the level of instructors' qualifications, which implies their mastery of digital computer technologies (Akhmedov & Shuhkrat, 2020). The substantiation of innovative technologies for teaching English is based on their relevance to the functions and means of the professional tasks to be solved by the trainees. This approach includes the interactive transformation of knowledge into activities, which is achieved due to the shift from subjective curriculum content writing to the development of integrated training courses representing a holistic picture of professional activity. The consideration of innovative trends as prospects for improving the teaching of English is associated with the possibility of their effective use in shaping students' professional communicative culture (Alibekova & Urinboyeva, 2020). The communicative situation influences the nature and goals of communication, which makes it the central concept of linguistic pragmatics. Teaching English based on the communicative approach stimulates students' activity due to the maximum number of channels used to receive information and memorize it better (Akramova, 2021; Alibekova & Urinboyeva, 2020). Bakhadirovna (2021) also mentions the use of lexical word games and distance education technologies for remote learning of foreigners as one of the effective interactive methods of teaching English (Guzachchova, 2020).

Integrated teaching of English is predetermined by prioritizing special professional tasks of students (Nsengiyumva, 2018). Technology enables instructors to better adapt the learning process to the student's abilities and characteristics, and improve students' language skills and the quality of education (Ahmadi, 2018). The use of mobile platforms is one of the ways to increase the effectiveness of English language teaching, providing an opportunity for collaborative learning as well as increasing the students' motivation and interest in learning (Mbukusa, 2018). The inclusion of the development of critical thinking in classroom activities is another innovative theoretical and practical idea in the English language teaching (Muratova & Abraimova, 2020). As for the use of information and communication technologies for teaching English, it is necessary to consider the opportunities provided by electronic and Internet resources for shaping communicative competence and its development in the course of classroom activities. Thanks to the intensification of the academic process, innovative information and communication technologies contribute to the development of students' skills to independently acquire new knowledge, and shift away from their mechanical learning, which increases the quality of memory retention and learning process efficiency (Muratova & Abraimova, 2020). Therefore, researchers evaluate the introduction of the communicative approach to teaching English as a revolutionary transformation of the academic process (Sharma & Khanal, 2019). The problem of creating and implementing modern methods of teaching English in the academic setting is related to the issue of shaping professionally significant skills, abilities, and special competencies that predetermine the success of graduates, their relevance, and competitiveness in the global labour market.

III. MATERIALS AND RESEARCH METHODS

The research procedure is based on the descriptive method, scientific literature data analysis, and theoretical modelling techniques used to develop a conceptual model for teaching English. Besides, to identify the professionally

significant areas of the study, the method of expert assessments was applied for interviewing master's degree students of the "Construction and Civil Engineering" speciality at the Kyiv National University of Construction and Architecture.

The research hypothesis was that developing and applying a conceptual learning model, which, based on the combination of intensive methods and technologies, will improve the effectiveness of teaching English for Special Purposes at technical universities.

The sample of respondents was made by a simple randomization procedure with the use of random numbers tables, which made it possible to make up a group of experts from a larger group, while the probability of extracting all possible samples of a given size was the same. The randomization procedure made it possible to avoid the bias associated with personal preferences and to obtain the desired result. As experts, 42 students (28 males and 14 females, aged 22.4 years on average) were interviewed, selected by simple randomization among all students of this speciality.

Initially, the authors proposed a conceptual model of teaching English, which was created as a result of using the observation method. In the work it was used the observation method. It allowed to determine more characteristic elements for this study based on researched aspects (Yüzlü & Dikilitaş, 2022). Consequently, the model was divided into three categories:

- intensive methods and technologies of learning;
- educational materials;
- technology in teaching.

The next step in the work was to determine the effectiveness of the presented model using the Thurstone scale. The Thurstone scale is a definition of intervals, considering psychological and social characteristics (lit.). To this end, students were asked to determine the most significant parameters for learning and sent answers to the mail of the authors' article within 12 hours. Students were proposed to indicate the most preferable parameter, excluding its gradation.

Focusing on the stages of professional knowledge (superficial, technical, dynamic knowledge), their possibility of applying was defined in the work by calculating the Shapiro-Wilk coefficient. The Shapiro-Wilk coefficient was chosen as a part of the research because it admitted to determine the significance of the values (Ghasemi et al., 2022):

$$W = \frac{(\sum_{i=1}^n a_i x_{(i)})^2}{(\sum_{i=1}^n x_i - \bar{x})^2} \quad (1)$$

where, $x_{(i)}$ – i th for research; \bar{x} – sample mean; a_i – statistical coefficients.

The limitations of the study were determined by its objective and tasks with the focus on teaching English to students of engineering specialities. Nevertheless, the general principles of creating a model of active language learning can be applied to the training of professionals in other specialities and extrapolated to teaching other foreign languages, with some minor adjustments to be made.

Ethical issues in the process of conducting the study were ensured due to compliance with the principles of tolerance, academic integrity, as well as other norms of bioethics.

IV. RESEARCH RESULTS

The contemporary interpretation of active teaching of English for special purposes is suggested as a generalized conceptual model of learning, which is a set of integrations of various modern teaching technologies and teaching materials. The combination of intensive teaching methods and technologies can be used simultaneously for teaching English for Special Purposes at technical universities (Figure 1.).

Intensive learning-and-cognitive activity and teacher-and-student interaction should be managed by an instructor so that important thematic issues and professional topics for the students of a particular specialization are taken into consideration. The conceptual model of active learning will foster harmonious development both of students and instructors in dynamic learning, thus embracing key psychological components for better mastering the learning material such as lack of fear, perception of knowledge as important, immersion in a set of experiences (recognition of familiar patterns), active self-assessment, and incorporating the gained experience into a broader worldview.

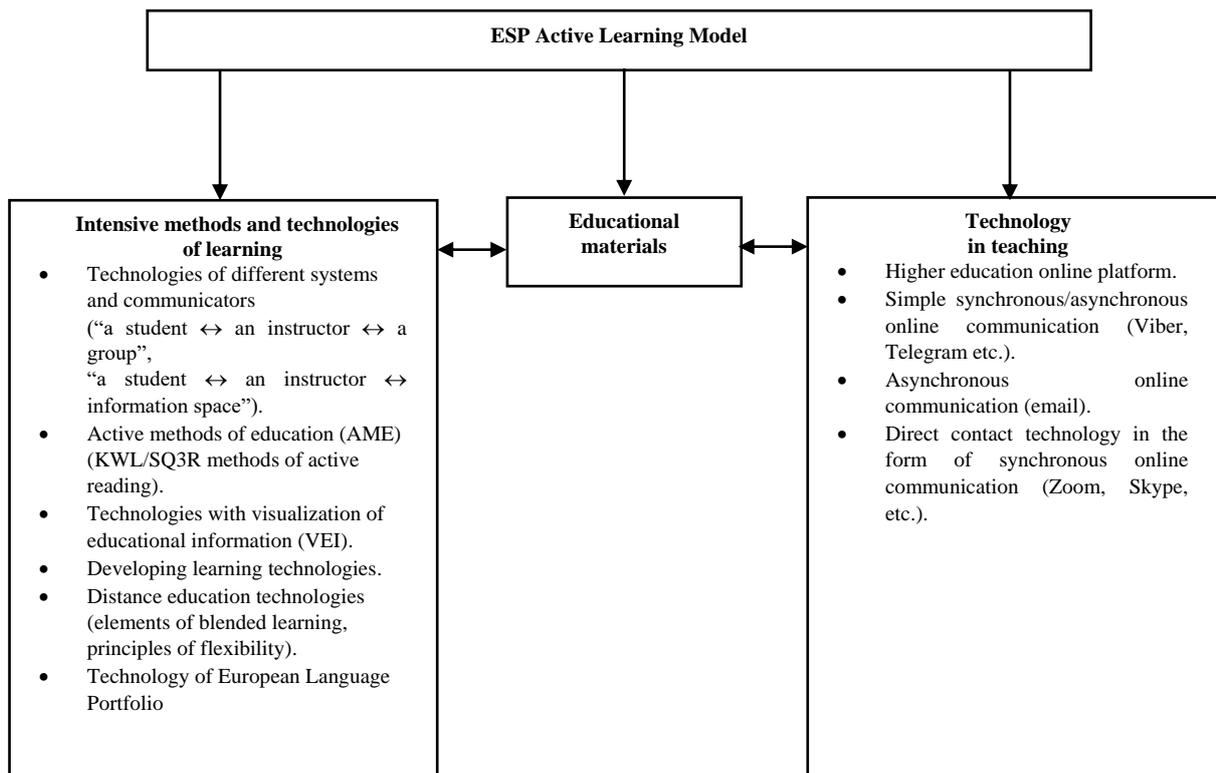


Figure 1. Conceptual Model for Active Teaching of English for Special Purposes in Technical Universities

Students’ behaviour in the course of knowledge acquisition is influenced by their feelings, beliefs, and values. This is also true for modern intensive technologies of the academic process, which are characterized by a combination of ergonomic, emotional, and mental components of student learning, which best suits the dynamic model of the organization of the educational process (Fussell & Truong, 2022; Huang et al., 2019).

As part of the study among the respondents, it was determined the most important parameters of the learning model for getting high scores. For this purpose, data from the respondents were obtained using the Thurstone scale (Table 1).

TABLE 1
EFFICIENCY OF THE PRESENTED MODEL IN THE EDUCATIONAL PROCESS

Intensive methods and technologies of learning	Distribution of respondents' answers	Technology in teaching	Distribution of respondents' answers
Technologies of various systems and communicators	15%	Higher Education Online Platform	27%
Active learning methods	22%	Simple synchronous/asynchronous online communication	26%
Technologies with visualization of educational information	24%	Asynchronous online communication	18%
Evolving learning technologies	21%	Direct contact technology in the form of synchronous online communication	29%
Remote educational technologies	18%		

In the category of intensive methods and technologies of learning, technologies with the visualization of educational information (24%) contribute more to effective learning and the activation of imaginative thinking in students.

Respondents concluded that the technology of direct contact was more important for the positive provision of the learning process in the synchronous form of online communication (29%). The use of popular online platforms (Zoom, Skype) promotes direct interaction between the teacher and the student, which helps to clarify the necessary points. Students consider (18%) that asynchronous online communication has the least importance for the educational process, being that email messages can be lost. There is no direct contact between students and teachers.

The dynamic learning model enables an instructor to combine students’ feelings, emotions, habits, and experiences during the learning process. Within its framework, Vopel (2003) identified three types of professional knowledge: superficial, technical and dynamic knowledge. Focusing on the presented model, the work determined which knowledge was developed to a greater extent. The results were defined using the Shapiro-Wilk coefficient (Figure 2).

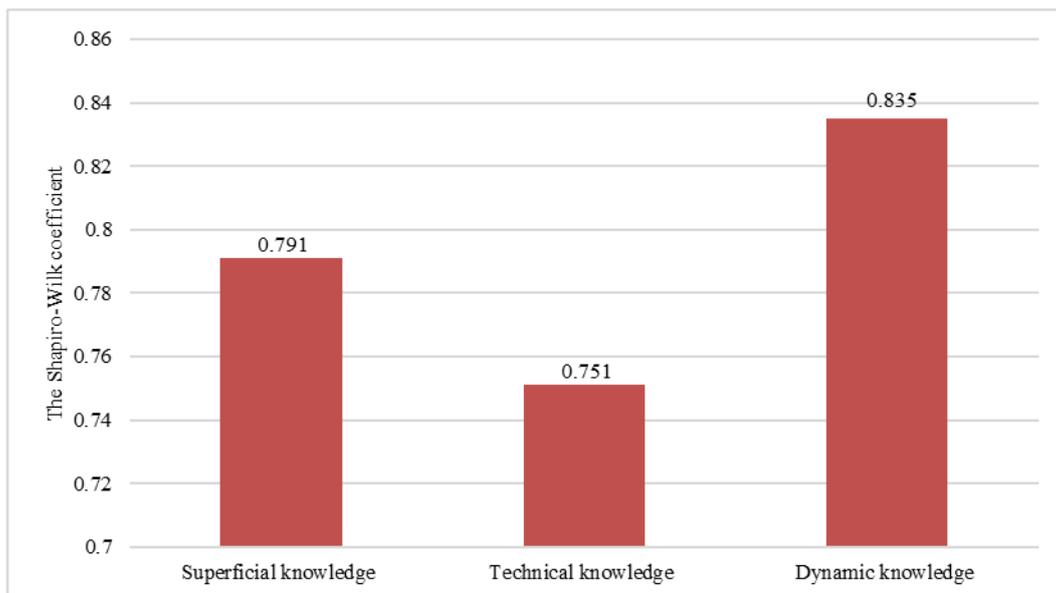


Figure 2. Development of Students' Knowledge in Accordance With the Proposed Model

Dynamic knowledge (0.835) was aimed more at students' independent work, contributed to experimentation, fantasy, and information exchange. Superficial knowledge (0.791) was achieved at a high level, as for as it allowed obtaining information from educational reference books. Technical knowledge (0.751) is aimed at determining specific knowledge of English. In this case, it will contribute to the development of professional skills.

In our study, we propose limiting technical knowledge to professional topics selected based on a survey of master's degree students in the “Construction and Civil Engineering” specialty at the Kyiv National University of Construction and Architecture. These topics have been recognized as relevant and promising for the field of modern civil engineering and are chosen as key areas in the development of the academic course program in the “Construction” discipline (Rubtsova et al., 2018; Rubtsova, 2019). Active reading methods, integrated into the conceptual model of active learning, contribute to the harmonious development of students’ dynamic knowledge and subsequent implementation of the acquired knowledge in their activity on the chosen topic. The use of the methods of active reading encourages students to cognitive activity in the learning process supported by intensive student-and-teacher cooperation, whereas a specific sequence of actions and interactions is typical of a teacher’s work with a group of students.

V. DISCUSSION

Mayes (2018), Alasmari and Zhang (2019) and Al Kurdi et al. (2020) distinguish between the concepts of “Technology of Learning” and “Technology in Learning”. At the same time, “teaching technology” is defined as methods of scientific organization of the teacher’s workflow for achieving learning objectives, whereas “technologies in teaching” are considered in the context of the technical teaching aids applied in the academic process by organizational and managerial tools (Figure 3).

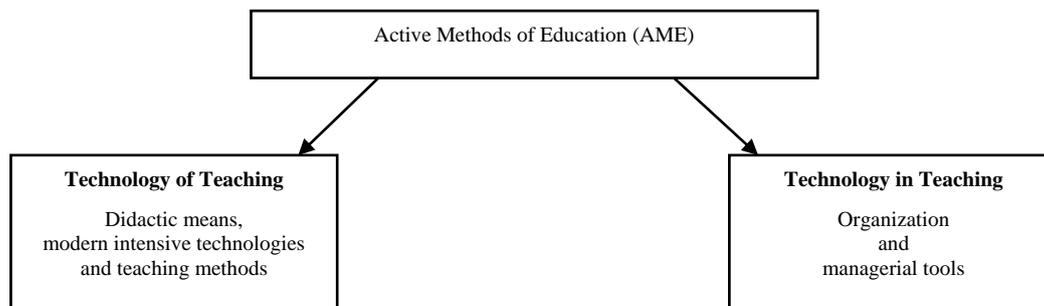


Figure 3. Scheme of Organization of Active Learning Methods

Scholars consider the didactic component to be particularly valuable in the process of integrating “technology of learning” and “technology in learning” (Ertmer & Ottenbereit-Leftwich, 2013). The results of the studies on the comparison of high-tech active classes and low-tech active classes show no differences in scores between the two types of classes (Nicol et al., 2018).

The academic process can be organized both for classroom and extracurricular activities by using a specific learning technology: elements of blended learning, the creation of flexible programs, and relevant educational materials based on the individual approach to trainees. The analytical review of didactic literature shows that there is no unanimous definition of the terms: “technology”, “method”, or “approach”. Pedagogical technology is a system of organizing instruction with certain systemic structural elements for learning purposes. The purpose of educational activity in such a system is ensured by the instruction methods, forms, and techniques taking into account the presentation of the didactic material stage (Rakhimov et al., 2020). Pedagogical technology is considered as a concretization of methodology, or a pedagogical system project that can be put into practice i.e. is considered as a way of application of the personalized approach in the academic process, aimed at encouraging the active creativity of students and fostering the development of their personal qualities (Zakirova & Qarshieva, 2020). Pedagogical technology, therefore, can be explained as instruction methods specifically selected and arranged in a certain sequence, which instructors use in the course of their practical activity (Safarova, 2021). The method of teaching foreign languages is considered in the scientific literature as a general model of learning, which is based on a certain area of study and relies on approaches specific to a certain area. The effectiveness of any innovative or intensive method of teaching English is predetermined by a combination of specific actions and operations made by an instructor to deliver the required knowledge. It is also aimed at developing skills and strengthening students’ activities in three areas: personal-didactic, general didactic, and general methodological (Sulaymonova, 2019). The creation of methods for developing foreign language competence in the late 19th and early 20th centuries was caused by the need to train specialists able to adapt to changes in their professional life (Belyaeva et al., 2019). Today, the subjective opinion, given both by students and instructors, refers to such effective methods of teaching English for special purposes as discussions and round tables. The discussion helps students integrate their knowledge from various fields into specific problem-solving, and contributes to the application of the acquired knowledge and development of critical thinking, which improves their understanding of theoretical material of any degree of complexity (Belyaeva et al., 2019).

The current labour market, effective management, and business growth require more knowledge in a short time. Students must be able to plan their learning strategies, independently choosing and combining various educational programs. Thus, this is another reason to make the teaching method flexible in practical terms. Teaching in an academic setting includes many interacting components: instructors, students, subject content, and teaching aids that function in dynamic networks. Therefore, we can consider the quality of learning as being dependent on the components and their interaction (Akhmedov, 2021; Toshtemirova, 2020). Syllabi and programs of academic courses should be justified by the needs of society, and therefore be modern and competitive. The integration of didactic and technical components will be effective and efficient in use. Thus, modern intensive technologies are a critical component of the vocational academic process meeting the needs of most students. The latest trends in the implementation of educational projects are associated with the use of augmented reality technologies, which has a positive impact on learning outcomes and ensure the graduates’ competitiveness in the global economic space (Iatsyshyn et al., 2019). Modern intensive educational technologies in the era of digitalization are marked by a high level of learning intensity, goal effectiveness, economy, energy intensity, ergonomics, and motivation, including: the effectiveness of a learning objective described as the ability to achieve a certain level of knowledge; energy and time saving (mastering a large amount of learning material in a short time interval); ergonomics (creating favourable conditions for a student with an emphasis on comfortable learning and cooperation); motivation (increasing students’ interest in the subject of study and bringing out the best in their personalities) (Kassymova et al., 2019). Teaching in an academic setting includes many interacting components: instructors, students, subject content, and teaching aids that function in dynamic networks (Frolova et al., 2020). There are modern technologies for intensive learning, which, in our opinion, can be equally effective for use in technical universities for teaching English. These intensive learning technologies include several components, including various systems and communicators, active learning methods, visualization of educational information, developing technologies, distance learning technologies, a European language portfolio, etc.

As our study has shown, several features of intensive learning technologies that can be effectively combined in the learning process are as follows:

1. Technologies of various systems and communicators for the interaction of participants in the academic process. Two systems of the academic process are possible, in particular, the system of the “student ↔ instructor ↔ group” interaction and the “student ↔ instructor ↔ information space” system of interaction. The possible system communicators are: student, instructor, a group of student’s information space. Two systems are included in this process:
 - The collaborative work of communicants, instructors, and students, in the system of the “student ↔ instructor ↔ group” interaction which enables them to exchange their ideas and encourages the cooperation of all students regardless of their level of English proficiency as well as contributes to the enrichment of new knowledge during the learning process (Nikolayeva et al., 2015);
 - The cooperation and interaction in the “student ↔ instructor ↔ information space” communicative system, which is an effective technology when students perform tasks and individual activities (Rubtsova et al., 2018).
2. Active teaching methods foster critical thinking development and promote the interaction of participants in the academic process, while the term “interactive” is often used to indicate additional interaction.

3. Visualization of didactic information, enabling students to effectively use the visual leading representational system to memorize new educational material (Rubtsova et al., 2018).

4. Development of learning technologies that ensure the transmission of knowledge and skills of students in a new situation and encourage both creativity and independent heuristic information search for knowledge. This technology is based on a scientifically based sequence of actions performed both by an instructor and a student (Nikolayeva et al., 2015).

5. Distance learning technologies supported by organized learning technologies are considered in two ways:

- The elements of blended learning can be effectively used for students' extracurricular and classroom preparatory activities (Beaver et al., 2014).

- The implementation of the flexibility principle, in particular, granting free access to ESP training materials. This enables students to choose a convenient time for classes and allows them to catch up and catch up. This cannot be regarded as fully replaced classes, but only the provision of free access for students to class materials for self-study purposes.

6. The European Language Portfolio provides an opportunity for self-assessment of the results of individual activity during the course and helps to strengthen students' confidence in their knowledge (Kühn & Cavana, 2012). This technology is a powerful stimulus for unlocking the potential and increasing the individual's internal motivation. We consider it necessary to collect and use the material prepared by students during their active learning in their activities (text work, presentations, etc.).

Thus, we consider it possible to combine the abovesaid intensive teaching methods and technologies in the process of active teaching of special-purpose English.

Modern technologies are effective under the conditions of a new educational environment and can open up an advanced opportunity for the academic staff to implement the managerial aspect giving students access to learning material with instructions for every stage of task completion and information search. The experience of using various programs and platforms in a lockdown period shows that an instructor can use multiple modern technologies in teaching: from Viber and Telegram to Zoom, Skype, email, Google Classroom, Google Meet, Moodle, Microsoft Teams, Edmodo, Uztest, iSpring, Mirapolis, etc. Remarkably, the instructors managed to respond to emergencies promptly and flexibly resulting in an effective arrangement of the learning process. The crucial drivers for such an organization are the urgent need and willingness both of students and instructors to take an active part in the academic process. The main purpose of emergency training is to replace the classroom mode of instruction with remote teaching. Direct contact technology gives the possibility to organize learning in the form of synchronous online communication via the programs enabling an instructor to communicate simultaneously with the entire group of students (Zoom, Google Meet, Microsoft Teams, etc.). We have identified some characteristics of intensive learning technologies that can be effectively combined in the learning process. The purpose of integrated technologies is to provide flexible learning with a trajectory of individual academic planning. First of all, for their implementation, it is necessary to provide students with free access to educational materials for classes on the university's online platform. In addition, simple synchronous/asynchronous online communication should be arranged, which will ensure prompt interaction with a group of students. This type of communication is useful for solving organizational issues and is easily accessible from mobile phones due to various messaging and calling applications such as Viber or Telegram, which are common among students and are a part of everyday life. It should be noted that students usually communicate in either application, whereas their instructor, in turn, must decide which application to choose for communication. The crucial moment for successful communication with a group of students is to decide which application is better to learn how to use. Asynchronous communication (e-mail) can be used for individual student work.

VI. CONCLUSIONS

As a result of the study, modern methods and technologies for teaching English for special purposes are generalized and suggested for the first time in the form of a conceptual model. We have identified some features of intensive learning technologies and suggested a contemporary interpretation of active learning in English for special purposes. The study proves the hypothesis that developing and applying a conceptual learning model that combines intensive methods and technologies will improve the effectiveness of teaching English for special purposes at technical universities. A combination of intensive teaching methods and technologies can be used to teach English for Special Purposes at technical universities. Active educational-and-cognitive activity, teacher-and-student interaction should be organized and maintained by an instructor, with a focus on the significant thematic issues and professional topics for students of a particular speciality and specialization. The use of the conceptual model of active learning in the academic process will provide an opportunity for the harmonious development of students and instructors in a dynamic learning model that has the key psychological components for better mastering of the course material: lack of fear, perception of knowledge as important; immersion in a set of complex experiences (recognition of familiar patterns); active self-assessment, which enables students to incorporate the gained experience into a larger worldview. Active reading methods, integrated into the conceptual model of active learning, contribute to the harmonious development of students' dynamic knowledge and further implementation of the acquired knowledge in their activity on the chosen topic. We consider it possible to combine intensive teaching methods and technologies in the process of active teaching of special-

purpose English. Prospects for further research are to experimentally test the effectiveness of the proposed model of teaching English for special purposes to students of various basic levels of training in online learning.

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