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THE DEVELOPMENT OF CEFR-BASED DESCRIPTORS FOR ASSESSING ENGINEERING STUDENTS' INTEGRATIVE ESP COMPETENCE

Abstract

The present study aims at developing a scale for planning learning outcomes and elicits possibilities for employing scale descriptors in assessment of language proficiency of students majoring in automotive engineering. The motivation for the research comes from the fact that Russian universities lack a clear system of criteria that can be used for planning and assessment of foreign language competence. With regard to education standards for Russian higher education, foreign language competence is presented as integrative ESP competence and described as a notion combining professional and linguistic constituents. The study employs methods of literature analysis, surveys and interviews conducted among ESP teachers and students of engineering majors. The findings of the research show that a potential solution is relying on the Common European Framework of Reference (CEFR). The authors designed a scale for A2 and B1 levels, where learning outcomes are presented as descriptors combining CEFR communicative skills with activities involved in on-the-job communication. The findings also include the learners' and experts' positive evaluation of the elaborated descriptors. The proposed scale and self-assessment grids have certain limitations. Therefore, further study directions are needed. Although meant for automotive engineers, the scale has a potential of being adapted to other engineering majors.

Key words

integrative ESP competence, learning outcomes, CEFR-based descriptors, assessment, self-assessment, automotive engineering majors.

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1. INTRODUCTION

After adopting the latest Federal State Educational Standards of Higher Education in Russia, the state demand for foreign language (FL) competence of university graduates is declared as a competence in business communication, which means that the target competence realized in FL teaching is Universal Competence 4 (UC-4). For bachelor students it is defined as the ability to carry out business communication in oral and written forms in the state language of the Russian Federation and foreign language(s) (Federal State Educational Standards, 2020). However, this wording does not fully reflect communicative needs of a university graduate. It is obvious that in the case of students not majoring in business-related disciplines, FL competence cannot be limited to the ability of business communication, and the goal cannot be achieved solely within the discipline "Business English", which is often absent in university curricula in Russia. Therefore, following Malyuga and Orlova (2018), it seems appropriate to interpret the concept of business communication as a set of communicative skills related to all job responsibilities in the professional area. In this case, Language for Specific Purposes (LSP) is central to developing these skills.

LSP (mostly English for Specific Purposes, ESP) has been traditional over decades in Russian universities. As the demand for a higher level of FL competence has increased in the last decade, it has become a challenge for Russian tertiary education to meet employers' requirements. Federal State Educational Standards of Higher Education contain only wordings of FL competence, but offer no system of plausible learning outcomes and components of FL competence for numerous majors. In this situation researchers and practitioners have to work out their own criteria. This appears to be an obstacle for many university instructors due to some factors: lack of methodological experience, insufficient knowledge of the communicative needs of graduates of particular majors, and employers' requirements for the competence in question (Batunova et al., 2018). To solve this problem, the urgent need for developing a clear and transparent system of learning outcomes was pointed out by Solovova (2013). In the context of training future automotive engineers, the major challenge is that in Russian automobile companies English is used as a medium of communication with foreign partners. In the meantime, ESP is taught at non-linguistic universities, where at a large scale there is no English-speaking environment, neither a framework of learning outcomes specifically for engineering majors.

2. THEORETICAL FRAMEWORK OF THE RESEARCH

2.1. Integration of language learning and a professional context

Communicative needs analysis has always been central to university ESP and EAP courses (e.g., Basturkmen, 2021; Hulme, 2021; Hyland, 2022; Shooshtari et al., 2023; Tomalin & Tverdokhlebova, 2021; Upton, 2012). This notion includes "needs" – a term "that embraces many aspects, incorporating learners' goals and backgrounds, their language proficiencies, their reasons for taking the course, their teaching and learning preferences, and the situations they will need to communicate in" (Hyland, 2006: 73). There is no doubt that ESP teaching at tertiary level involves combining professional content with its language form. In Russian and world practice, lots of approaches and techniques have been implemented and have proved their effectiveness over decades. A retrospective review provided by Belcher (2006) shows that major trends include the learner-centered approach, content-based instruction, corpus linguistics and discourse analysis approaches. Discourse studies are used by many language instructors in Russia and abroad to specify the scope of professional communication. For example, Ananyeva (2014) claims that many university students lack knowledge about target discourse communities, and forming this awareness is one of the main objectives of both content and language teachers. Some researchers (e.g., Nekrasova-Beker et al., 2019) suggest focusing on discipline-specific vocabulary and its contextual use, which implies working with professional concepts. All the above-mentioned sources clearly point out that university ESP courses always involve integration with content learning. Content and Language Integrated Learning (CLIL) is one of the common approaches proposed to address the need to acquire both language skills and content knowledge. Let us briefly consider their key features in order to prove that the implementation of both in Russian education is full of challenges and ESP remains the most preferable approach under existing conditions.

According to Airey (2016), CLIL lecturers focus on both language and content issues, and both language and content learning outcomes are expected to be obtained at the end of a CLIL course. English medium instruction (EMI) courses are tailored for students with quite high levels of language proficiency and therefore do imply little or no language-related learning outcomes. ESP focuses primarily on language learning issues and provides "learners with the language skills necessary to master the content knowledge" (Yang, 2020: 69). In Russia the establishment of tertiary level CLIL programs has been encouraged in the drive to internationalize higher education (Sidorenko et al., 2022; Sysoyev, 2021a).

Significant achievements have been made by lecturers involved in CLIL in Russia, but in the meantime, many researchers indicate some restrictions on using CLIL methodology. For example, Ennis (2015) experimentally proved that subject courses can be effectively taught in English only when students already have certain

skills that should be acquired in English for specific and academic purposes (ESAP) classrooms. This means that there should be a stage that precedes CLIL and generally transforms into CLIL at further stages in the educational process. The results obtained in his research clearly show that the possibility of teaching CLIL without ESP is rather disputable. This conclusion accords with Yang (2016: 60), who proposes "co-teaching between language and content teachers in an ESP or a CLIL course", i.e., a combination of both types of courses.

Despite a number of successful experiences, implementing CLIL at a large scale is still a disputable issue for Russian universities (Sysoyev, 2019). Firstly, CLIL courses can be successfully taught to undergraduate students whose level of English is not lower than B1. Secondly, a CLIL lecturer must have a C1-C2 level of communicative competence and sufficient knowledge of language teaching methods, which means that not all content teachers possess necessary qualifications. It has been recently proved that training such content teachers is an extremely costly process for a state university (Sysoyev, 2021b), and implementing CLIL courses faces lack of resources and a number of pedagogical problems that have not yet been solved (Sidorenko et al., 2022). As for European universities, Arnó-Macià et al. (2020) argue that EMI can also be implemented at further stages of educational process, when students have certain awareness of specialized communication, which is achieved within ESP courses taught prior to content ones. The authors question the possibility of replacing ESP by content-focused programs, such as CLIL or EMI, even at European universities. So, for Russian universities that have little or no resources for CLIL or EMI courses, an alternative way to integrate professional and linguistic aspects of on-the-job communication might be realized within ESP courses. This approach involves selection of professional content and appropriate language in accordance with the requirements in the potential workplace. A successful attempt was undertaken in Tsepilova (2020), where integration is achieved on the level of language and professional competences, corresponding to the ideas of competence-based approach central to Russian education. Further publications / studies observe models of ESP and content teaching in Russian universities (Tsepilova & Bazhutina, 2021) and contain grounded recommendations for teaching ESP which should precede CLIL (Sysoyev, 2021a) or should be properly integrated with CLIL (Sidorenko et al., 2022) and EMI (Costa & Mastellotto, 2022). The present study relies on the approach called 'integrated ESP teaching' (Koryakovtseva, 2020), which has a potential of becoming the golden means among the existing models of integrating content and language teaching, with a great similarity to the pattern of ESP courses described by Yang (2016). The result of integrated ESP teaching is viewed by the authors as integrative ESP competence. It is regarded as an integrative notion combining traditional components of communicative competence with professional knowledge, skills and experience selected in the amount that is necessary and sufficient for mastering cross-cultural communication in accordance with potential job responsibilities and the current level of FL proficiency (Bazhutina & Tsepilova, 2022: 23). The problem

of defining the 'amount', which would be 'necessary and sufficient', is central to integrated ESP teaching. An effective solution can lie in elaborating descriptors bound to levels of language proficiency and communicative needs of graduates of a particular major. The same approach to defining ESP competence was employed by Luka (2009). A number of the proposed indicators describe this competence in a general way (Tsepilova, 2020: 64-65, 75-76), listed below:

1. Linguistic and professional knowledge needed for professional communication. When selecting target knowledge, the university teacher should take into account specific features of engineering communication. On the one hand, an engineering student does not need to know some aspects of the language system, for instance, all verb forms, etc. On the other hand, engineering students need to know discipline-specific terminology, professional jargon, cliches and grammatical structures characteristic of communication in a particular field. Professional knowledge is also included in this system because communication can hardly be meaningful and successful without certain knowledge shared by its participants. This corresponds to the concept of 'common ground' introduced by researchers in the field of pragmatics (Clark & Brennan, 1991; Kecskes, 2014). In everyday communication, common ground is usually associated with its cultural aspects (e.g., shared knowledge about appropriate behavior in certain situations). Professional information involved in engineering communication can be regarded as 'common ground' shared by specialists working in the same field.
2. Communicative skills necessary for professional communication. This set of skills is different for every particular engineering major / degree. For example, chemical engineers must be able to describe process flowsheets, while electronic engineers are more likely to deal with circuit diagrams.
3. Skills relative to combining linguistic and professional knowledge. For example, expressing professional concepts in foreign language terms that denote these concepts. Compensatory skills also appear very important. By this we mean something more complicated than simple translation. When a learner comes across a foreign term denoting a familiar concept, he or she must be able to explain what this concept means using the knowledge that was obtained in professional courses in his or her native language. An engineer should be able to compensate for a lack of linguistic knowledge by engaging professional information. This includes rephrasing and using graphical representations and symbols accepted in international professional community.
4. Awareness of situations of professional communication specific to a certain engineering degree. This means that both engineering students and their language teacher should know when and how engineers use a foreign language for academic, professional and research purposes.

In the present study, these indicators seek to be represented by means of scale descriptors.

2.2. CEFR-based scales in tertiary education

The second point of the research methodology covers some relevant issues of how descriptors of the Common European Framework of Reference for Languages (CEFR) are used in FL training at universities. The developers of the CEFR assure that "fundamentally, the CEFR is a tool to assist the planning of curricula, courses and examinations by working backwards from what the users / learners need to be able to do in the language" (Council of Europe, 2020: 28). The CEFR itself is used for assessing students' interactional skills (Shak & Read, 2021), designing university curricula in accordance with the objectives of a particular institution (Çağatay & Gürocak, 2016) and applying the European Language Portfolio in engineering universities (Batunova et al., 2018; Miroshnikova, 2008). Following the CEFR, the term "assessment" in the present study is used "to refer to the implementation of language competence, thereby focusing on learner performance and its analysis", and self-assessment is seen as one of the reflective tools (Picardo et al., 2011: 42-43).

A review of literature also gives examples of the implementation and extensive experience in working with the framework and advice on developing a context-specific grid (Cambridge ESOL, 2011; North, 2014). It is worth mentioning various ways of implementing CEFR descriptors: for designing descriptors for multi-level scales (Polyakova, 2011) and for B1-B2 levels (Miroshnikova, 2008) in the case of particular engineering and science bachelor and master degrees. The CEFR-aligned assessment tools in the context of teaching FL spoken interaction to law and engineering students were elaborated and tested by Voskresenskaya and Polushkina (2020). Athanasiou et al. (2016) suggest that CEFR-based descriptors should become a helpful tool for facilitating the description of ESP competence levels corresponding to the CEFR ones. Another CEFR-based ESP competence assessment system proposed by Luka (2014) contains descriptors for B1, B2 and C1 levels, which include not only language skills, but also professional fields they are related to.

Furthermore, other researchers specified particular levels (e.g., Berger, 2020) through their practice. Another focus of study became learner-centered self-assessment and reporting procedures (Little, 2005). A good example of a self- and peer-assessment system based on CEFR descriptors is the ACPEL Portfolio (Durán et al., 2009). Such attempts testify to the growing interest for implementing CEFR-based scales in various contexts. What is expected as the major findings of the research is the representation of integrative ESP competence in specific learning outcomes preferably formulated as descriptors for a two-level scale and self-assessment grids for automotive engineering majors.

3. DESIGNING A SCALE OF CEFR-BASED DESCRIPTORS

3.1. Research methods and questions

This quantitative and qualitative research adopted combined methods of analysis of various sources, interviews, anonymous surveys based on a Likert scale, and the qualitative interpretation of the obtained results. The questionnaires were quantitatively analyzed using descriptive statistics.

The use of these methods is aimed at designing new scale descriptors. Since planning goes hand in hand with assessing, the researchers were focused on developing descriptors that would become detailed learning outcomes and assessment tools. Another objective was estimating their effectiveness. The learning outcomes should meet FL communication needs for professionals in the automotive engineering and meet employers' requirements for FL proficiency. Thus, four key research questions were formulated to guide the present study:

1. What data should be obtained for designing descriptors in order to use them afterwards as learning outcomes? (RQ1)
2. Why should the CEFR-based format be chosen and how can CEFR descriptors be applied in designing a new scale of descriptors? (RQ2)
3. How can the design process benefit from students' feedback? (RQ3)
4. How can we evaluate validity of the proposed scale of descriptors for planning learning outcomes and effectiveness of the self-assessment grids? (RQ4).

3.2. Study context and participants

The research was conducted during 2020-2022. The participants were 56 volunteering 1st-4th year undergraduate engineering students from Tomsk Polytechnic University (TPU) and Togliatti State University (TSU) who were made aware that their responses would be anonymous and would not have any impact on their course grade. Among the participants, there were also eight ESP teachers from both universities who had been teaching integrated courses for more than 10 years. Disciplines taught by the instructors included ESP as a special discipline for the 3rd and 4th year students, elements of ESP within the EFL course for 1st and 2nd year students and elective ESP courses available for undergraduates over the whole period of study. One of the participants had experience in teaching professional disciplines in English.

To evaluate the validity of the scale of descriptors and self-assessment grids for planning learning outcomes and assessing language proficiency, two more language teachers were interviewed. Both interviews lasted up to 5-7 minutes and were shorthanded by one of the researchers. Expert 1 was a senior instructor at TPU and postgraduate for a PhD degree in pedagogy, with expertise in teaching ESP to

engineering students. Expert 2 was a student for a master's degree in automobile engineering at TSU and holder of the bachelor's degree in linguistics, a content and language teacher with expertise in cross-cultural engineering communication in the automotive industry. The authors of the present paper also held interviews with five master students of automotive engineering working for an international automobile company. All these volunteering participants were informed about the purpose and possible outcomes of the research and gave consent to use their responses, credentials and a brief description of work experience relevant to the research.

3.3. Data collection

Data collection took place in five stages.

Stage I
A number of sources for collecting necessary data were thoroughly analyzed to elicit requirements for FL competence in the automotive industry: Federal State Educational Standards for Higher Education, university syllabi of professional and ESP courses, CEFR descriptors, previous studies about designing scales of language proficiency of engineering students, companies' websites and employers' job advertisements. At this stage, interviews with master students were also conducted to elicit what situations and communicative needs are typical of cross-cultural communication in the automotive industry in Russia. TSU master students were asked questions about typical FL communication situations, participants, types of documents, etc.

Stage II
To answer RQ2, an anonymous survey was conducted among 8 volunteering instructors of English at TPU and TSU to elicit information about students' preferable format of their proficiency assessment. The instructors of English were asked questions inquiring their opinions about the best way to plan and assess students' FL proficiency. They were offered to choose between the format which is traditionally used in Russian tertiary education and based on knowledge and skills, and the CEFR-based one.

Stage III
The first survey was administered among 56 students, and 56 valid questionnaires were received. The participants were asked 6 questions aimed to obtain their evaluations and recommendations about two piloted English textbooks for students of automobile engineering: *English for Students of Mechanical Engineering (ESME)* and *English in Automobile Engineering (EAE)*.

Stage IV

The second survey for students was administered online, and 50 engineering students from both universities participated in it. The aim was to find out whether the students were familiar with levels of language proficiency and the CEFR descriptors.

Stage V

The purpose of the final stage was to validate the scale of descriptors and self-assessment grids for designing learning outcomes and assessing language proficiency of automotive engineering students. The final survey was administered among 20 TSU students from automotive engineering majors who participated in the previous survey. They were selected because during one academic year (2021-2022) they were completing English courses using the two piloted English textbooks and the authors' self-assessment grids. To conclude the process of evaluating the developed descriptors and self-assessment grids, interviews with two experts were conducted. Both instructors had not been involved in the design of the textbooks and had carefully read the developed descriptors before participating in the interviews.

4. FINDINGS

4.1. Description

All the data collected at Stage I helped answer RQ1 and was relevant to requirements and communicative needs, making it possible to single out typical communication situations. They include: small talk, an engineering dialogue, presentations, business meetings, reporting project outcomes, writing business letters, reading technical documentation, etc. These situations were central to designing descriptors. The analysis procedure agrees with the target situation analysis that "concerns the learners' future roles and the linguistic skills and knowledge they need to perform competently in their disciplines" (Hyland, 2006: 74). All the sources and obtained data are summarized in Table 1.

SOURCES					
Federal State Educational Standards for Higher Education	Syllabi of professional disciplines	CEFR descriptors for communicative language activities	Companies' websites	Employers' requirements for FL competence on companies' websites	Previous studies and interviews with working master students

DATA OBTAINED					
The wording of FL competence for business communication	A list of professional competences, skills relevant to designing descriptors: knowledge of professional concepts, processes and designs in automotive engineering	Skills at A2 (A2+), B1 (B1+) levels relevant to the professional sphere of communication	According to the degree of intensity of cross-cultural communication, at least 25 out of 36 in Russia's automobile industry are the ones with constant international connections or joint enterprises, e.g., AVTOVAZ, Hyundai Motor Manufacturing Rus	Job requirements vary from A2 to B2 (according to the CEFR) without any reference to language proficiency in the professional sphere	Specific FL communicative needs for developing descriptors for all communicative language activities

Table 1. Sources and data used for developing descriptors

At Stage II, a draft version of a two-level scale was developed using learning and skills objectives from *ESME* and *EAE*. These textbooks are skill-based, and all the units are supplied with learning and skills objectives that are consistently covered in tasks and exercises of each unit in order to form components of ESP competence, thus serving as "prototypes" for future CEFR-based descriptors. Here are some of the learning and skills objectives:

Learning objectives: to revise and master some speech patterns according to the topic of the unit; to develop speaking skills in cross-cultural communication situations concerning car maintenance; to develop writing and translation skills.
Skills:

- *You will learn new vocabulary and speech patterns about the car exterior and maintenance.*
- *You will learn how to describe maintenance works in English.*
- *You will keep on practicing written translation skills.*
- *You will develop your listening and reading skills.*
- *You will develop your writing and speaking skills in creating an audio podcast.* (*ESME*, Unit 4).

The results of the survey among TPU and TSU teachers enabled the researchers to answer RQ2. Seven out of 8 respondents (87.5%) chose the CEFR-based format. At the same time, having analyzed assessment grids developed by other authors (e.g., Baryshnikova, 2014; Koryakovtseva, 2020; Luka, 2014; Miroshnikova, 2008; Polyakova, 2011), it was discovered that they use some features of the CEFR design for developing scale descriptors. In addition, the researchers themselves

participated in a large-scale survey about the use of the CEFR at tertiary level administered by Moscow State Linguistic University in June 2021.

These facts motivated the researchers to use the CEFR format as the starting point for the new descriptors and self-assessment grids. Thus, the CEFR design and labels of A2 and B1 levels were employed in the development of descriptors for representing and assessing integrative ESP competence. This was done for two reasons. First, the overwhelming majority of learners in the participating groups of engineering students had the target proficiency at A2 and B1 levels. Second, the findings about the requirements for FL proficiency in Russian automotive engineering suggest A2 as the minimal level.

Since A2 descriptors have little to do with professional use of language, it was decided to supplement most of the relevant CEFR descriptors with indicators about professional use. The same was done in the ACPEL Portfolio (Durán et al., 2009). However, this study is necessary because more specified descriptors were elaborated to address specific needs in the context of the Russian automotive industry and engineers' training in Russia. For this purpose, some portion of descriptors was newly designed, and some were adopted from Polyakova's (2011: 149, 288, 365-372) 5-level scales, for example, abilities to participate in an engineering conversation, to read a few technical texts simultaneously, to write instructions and some others. All these descriptors were later used in the corresponding self-assessment grids (see Table 3 below).

With regard to RQ2, the traditional Russian phrasing "a student must know", "a student must be able to …", "a student must have" (which is used in working syllabi at universities) was compared to the CEFR format. The traditional format prescribes to describe knowledge, whereas language acquisition is based on skills rather than mere knowledge of grammar forms and rules, and the "I know" descriptor is not found in any of language competences, activities or strategies – for example, in the latest edition of the CEFR (Council of Europe, 2020). Besides, the analysis of university syllabi for ESP courses shows that four communicative language activities do not fit well the traditional format because it makes it rather complicated to say what "a student must be able to do" and what "a student must have". The CEFR format proves to be appropriate because the framework sees "language as a vehicle for communication rather than as a subject to study" and "it proposes an analysis of learner's needs and the use of "can do" descriptors and communicative tasks" (Council of Europe, 2020: 29).

At Stage 3 fifty-six valid questionnaires were received from TSU students of engineering majors at the end of their English courses. Table 2 contains 5 close-ended questions.

QUESTIONS / ANSWERS	KIND OF YES	YES	KIND OF NO	NO	I HAVE DIFFICULTY TO ANSWER
1. Does the textbook meet your expectations from learning English at university?	25%	71%	2%	2%	0 %
2. Does the content of the textbook correlate with your major course of studies?	18%	80%	0%	2%	0%
3. Does the textbook correlate with your level of proficiency in English?	46%	46%	8%	0%	0%
4. Has the textbook helped to improve your English proficiency, i.e., to develop communication skills in English for your future profession?	30%	70%	0%	0%	0%
5. Would you like to recommend this textbook to other students of automotive engineering?	22%	72%	2%	4%	0%

Table 2. Results of the first survey among engineering students

The findings demonstrate that the majority of responses had a positive evaluation[1] of the textbooks. Their content meets the learners' expectations from the offered ESP courses (96%) and correlates with their majors (98%) and level of language proficiency (92%). About ninety-four per cent of respondents would like to recommend the textbooks. Negative responses to Questions 1, 2 and 5 are mostly from the learners whose first major was military training and their expectations could have been different from those who have only an automotive major. Three other negative answers to Question 3 manifest that it was either too easy or too difficult to study using these textbooks. Despite a few negative responses to Question 3 about the correlation with the learner's level of proficiency in English, there are only positive answers to Question 4 (100%). The open-ended question *'Would you like to propose something to improve the quality of the textbook?'* received 15 responses (27%), among which there are 8 responses about being completely satisfied and 3 answers about including more speaking activities. One answer expressed a wish to include grammar for 'normal' communication situations apart from communication in the professional sphere. Three students left minor comments not related to the quality of the textbooks.

As the first survey among students shows, their positive feedback confirmed the adequate choice of the learning and skills objectives for the future scale of descriptors that benefited from students' recommendations for including more speaking activities and frequent communication situations. At this stage, RQ3 was

[1] All positive and negative responses were calculated by summing up "kind of yes" and "yes", "kind of no" and "no" respectively.

answered: *How can the designing process benefit from students' feedback?* The sequence of actions for the developing process was the following:

1) arranging the draft learning and skills objectives into respective communicative language activities in four fields of competence: reception, production, interaction, and mediation with further specification;

2) transition from "You will do" to "can do" and "I can do" formats;

3) simultaneous modification of relevant CEFR descriptors (Council of Europe, 2020: 48, 54, 62, 66, 72) to the actual communicative needs elicited at Stage 1.

Figures 1 and 2 below present the developed descriptors of the two-level scale.

COMMUNICATIVE LANGUAGE ACTIVITIES		A2 DESCRIPTORS
RECEPTION	Oral comprehension	**CAN** understand straightforward factual information, directions; main points of spoken statements, messages (during a conversation, while listening to a simple, well-structured and illustrated presentation with visual aids) on a well-known professional topic, provided the speaker's pronunciation is correct and the pace is relatively slow. **CAN** understand the main ideas from audio-visual sources of information on a familiar professional topic, provided the speaker's pronunciation is correct and the pace is relatively slow.
	Reading comprehension	**CAN** choose the type of reading (scanning, skimming, for detail and study) depending on the extralinguistic purpose when working with reference literature, information resources and platforms. **CAN** understand content of business letters. **CAN** satisfactorily understand the main content of scientific and technical texts on general professional disciplines (for example, on mechanics) if there is an opportunity to reread it and use a dictionary.
PRODUCTION	Oral production	**CAN** describe technical and technological processes (related to vehicle operation relying on the content of the discipline 'Introduction into Automobile Engineering', personal experience or newly acquired knowledge), characteristics and design of the car within the topics covered in professional disciplines. **CAN** realize their communicative intentions in interpersonal communication on a familiar professional topic in accordance with rules of business etiquette: greetings, addressing a colleague, finding out and passing on information, requests, promises, refusals, expressing opinion, etc. without prior preparation.
	Written production	**CAN** fill in a form. **CAN** write a simple instruction. **CAN** write a brief press release on new products on vehicle market using a dictionary if necessary. **CAN** make a brief summary of an information source for a report on a professional topic.
INTERACTION	Oral interaction	**CAN** talk about their studies at university, hobbies, free time, as well as desires, preferences and interests within the scope of professional topics. **CAN** participate in an engineering dialogue in the "question – answer" mode within familiar professional topics. **CAN** realize their communicative intentions in accordance with rules of business etiquette in cross-cultural business communication with prior preparation: greetings, addressing a colleague, finding out and passing on information, requests, promises, refusals, expressing opinion, etc. using telecommunications if necessary. **CAN** give a short, rehearsed talk with a presentation on a professional topic. **CAN** take up a limited number of straightforward follow-up questions if they can ask for repetition and if some help with the formulation of their reply is possible.
	Written interaction	**CAN** write a business letter or a message using appropriate style and format for sending via telecommunication services.
MEDIATION (mediating a text)	Written translation of a written text	**CAN** provide written translation (into native language) of very short, simple, everyday texts including news of the automotive industry. Although linguistic errors may occur, translation remains comprehensible.
	Oral translation of a written text	**CAN** provide oral translation (into native language) of very short, simple, everyday texts including news of the automotive industry. Linguistic errors may occur.

Figure 1. Descriptors for level A2

COMMUNICATIVE LANGUAGE ACTIVITIES		B1 DESCRIPTORS
RECEPTION	Oral comprehension	**CAN** understand straightforward factual information, directions; main points of spoken statements, messages (at a technical meeting, at a lecture, during a conversation, while listening to a report or a presentation with visual aids) on a familiar professional topic, provided the speaker's pronunciation is correct and the pace is relatively slow. **CAN** understand the main ideas from audio-visual sources of information on a familiar professional topic, provided the speaker's pronunciation is correct and the pace is relatively slow.
	Reading comprehension	**CAN** choose the type of reading (scanning, skimming, for detail and study) depending on the extralinguistic purpose when working with reference literature, information resources and platforms when working with several texts in a foreign language. **CAN** satisfactorily understand the main content of a research article on technology and its abstract, regulatory acts (regulations, standards, etc.), specifications, requirements, reports on a familiar professional topic and assess the relevance of each source to professional activity if there is an opportunity to reread it and use a dictionary. **CAN** understand rules, equipment instructions, captions for drawings, product and process descriptions in a coherent text (e.g., in a manual or a guidebook) using a dictionary if necessary. **CAN** understand written specifications, captions for drawings, graphs and figures using a dictionary if necessary. **CAN** understand content of business letters.
PRODUCTION	Oral production	**CAN** describe technical and technological processes, the design of an object. **CAN** comment on visual representations used by engineers (figures, diagrams, flow sheets, drawings, etc.).
	Written production	**CAN** fill in a form. **CAN** write an instruction, a section of project documentation, a caption for a drawing. **CAN** take notes when listening to a report or a message.
INTERACTION	Oral interaction	**CAN** realize their communicative intentions in accordance with the rules of business etiquette in typical situations of cross-cultural business communication with prior preparation: a meeting, a report, a project presentation based on familiar speech patterns, and answer questions if they can ask for repetition. **CAN** participate in an engineering dialogue in the "question – answer" mode within professional topics studied in professional disciplines provided they can ask for repetition or reformulation. **CAN** realize without prior preparation their communicative intentions in interpersonal communication on a familiar professional topic in accordance with the rules of business etiquette: greetings, addressing a colleague, finding out and passing on information, requests, promises, refusals, expressing opinion, etc. using telecommunications if necessary.
	Written interaction	**CAN** write a business letter or a message for sending via telecommunication services. **CAN** write a resume, a cover letter.
MEDIATION (mediating a text)	Written translation of a written text	**CAN** provide written translation (into native language) of specifications, requirements, instructions, an abstract of a research article on a familiar professional topic using a dictionary if necessary. Although linguistic errors may occur, translation remains comprehensible.
	Oral translation of a written text	**CAN** provide oral translation (into native language) of specifications, requirements, instructions, an abstract of a research article on a familiar professional topic although lexical and grammatical limitations may cause difficulty with formulation at times.

Figure 2. Descriptors for level B1

At Stage IV, the second student survey was administered among 50 engineering students from both universities, and 50 valid questionnaires were received. Before completing the questionnaire, each group of students was told about the CEFR descriptors: their types, content, and purpose. Then students of several engineering majors were asked to answer questions on whether they previously knew about the CEFR. Thirty-six students (72%) did not know about the CEFR, 14 students (28%) did know, but only 7 students out of 21 (33%) used them for planning and self-assessing their proficiency in English. Moreover, forty-four students (88%) were aware of the existence of levels of proficiency in English (from A1 to C2) and 41 respondents (82%) were familiar with levels from elementary to proficient. The key question was whether they were interested in planning and assessing their proficiency in English, to which 36 students (72%) replied that they would like to plan their learning outcomes and to assess the achieved language proficiency. Thirteen students (26%) answered negatively, and 1 student (2%) had not considered it. Thus, these results contribute to answering RQ3 about the benefits of the learners' feedback.

Twenty out of these 50 students were TSU students who used the piloted textbooks. During one academic year before completing each unit in *ESME* and / or *EAE,* they were instructed to study carefully a list of "I can" descriptors in the self-assessment grid and then were offered to use them for identifying specific communicative skills when doing tasks and exercises. Thus, all the participants could make sure that what was offered matched their individual needs and the ones in automotive enterprises. This process was meant to reflect what skills a learner was going to master. After that, the students were asked to self-assess the acquired skills. To perform these procedures, each participant was provided with a copy of a self-assessment-grid in two formats: as one table with the A2 or B1 descriptors in Russian and as 8 tables with the same descriptors translated into English and specified for each unit in *ESME* (A2) or *EAE* (B1). Figures 3 and 4 illustrate how the self-assessment grids were specified, using examples of some A2 descriptors.

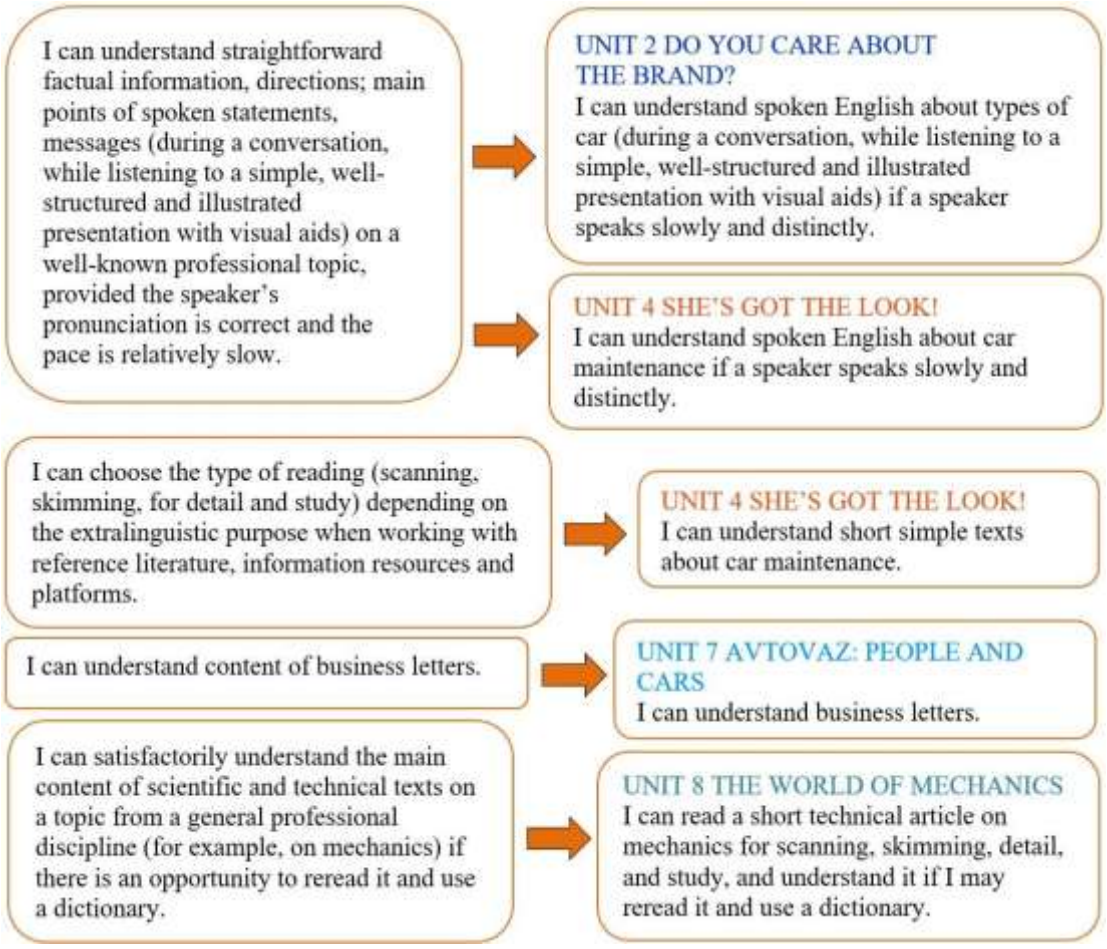

Figure 3. Examples of descriptors for oral and reading comprehension for the A2 self-assessment grid and *ESME* units

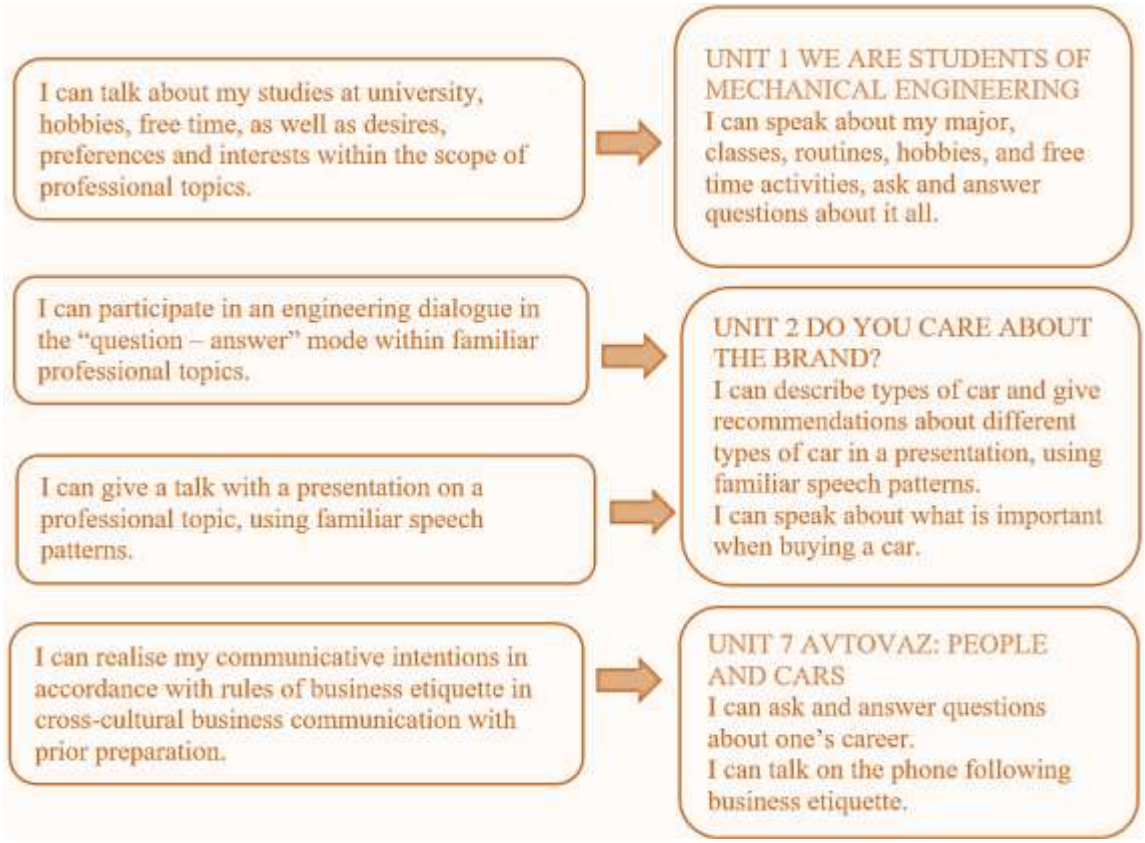

Figure 4. Examples of oral production and interaction descriptors for the A2 self-assessment grid and *ESME* units

Table 3 below contains an example of the specified B1 self-assessment grid.

UNIT 6 – CAR SUSPENSIONS	**I CAN** describe the design of rear and front suspensions.
	I CAN describe some basics of a designing process.
	I CAN read and understand a technical article about the suspension geometry using a dictionary and some reference books.
	I CAN participate in an engineering talk about suspension design.
	I CAN make some notes of a lecture if a speaker uses some visual aids.
	I CAN use business etiquette (including online communication): to greet my communication partner in formal and informal way, to start communication, to ask for more information, to show whether I understood or did not understand the answer, to finish communication, to join the discussion again.

Table 3. An example of the B1 specified self-assessment grid for Unit 6 in *EAE*

After completing each unit, they were given three options to assess their progress: marking either +/- (i.e., "I can" or "I can't"), or "very well, well, not very well". Overall, during one academic year each group of participants completed no fewer than 8 units and filled in 8 self-assessment grids. The analysis revealed that all the participants filled in the proposed self-assessment grids, and the overwhelming majority of marks was either pluses or "very well", "well" with every participant. In one of the two A2 level groups several "I can" descriptors were marked as '-' because the corresponding skills were not mastered due to the cancellation of some classes. A few "not very well" marks in most grids may tell about the participants' conscious attitude to the proposed procedure of self-assessment.

At Stage V, these twenty students were offered to answer three questions, and twenty valid questionnaires were received (see Table 4).

QUESTIONS / ANSWERS	KIND OF YES	YES	KIND OF NO	NO	I HAVE DIFFICULTY TO ANSWER
1. Each unit is introduced by a list of communicative skills you were offered to acquire. Do you think this list reflected your communicative skills correctly?	30%	70%	0%	0%	0%
2. Did the scale of descriptors help you plan the outcomes of acquiring the proposed communicative skills listed at the beginning of each unit?	60%	35%	5%	0%	0%
3. Did the self-assessment grid help you adequately assess your communicative skills after completing each unit?	60%	35%	5%	0%	0%

Table 4. Results of the survey on the effectiveness of the scale and self-assessment grids

Positive responses to Question 1 mean that the suggested communicative skills were adequate to the learners' needs. Questions 2 and 3 received 19 positive responses, i.e., almost all the learners agreed that the scale and grids were helpful.

Finally, two instructors were interviewed. The interview consisted of three questions, two of which related to whether the developed descriptors and self-assessment grids were adequate for planning learning outcomes and assessing engineering students' language proficiency, and whether their composition was methodically sound. Both experts answered positively about the adequacy of the developed descriptors for planning learning outcomes and assessment and self-assessment. Answering Question 3 (whether the content of the presented descriptors complies with the requirements of Universal Competence 4 (UC-4)), Expert 1 stated that the content complied with this competence. Question 3 for Expert 2 was as follows: *From the viewpoint of cross-cultural engineering communication in the automotive industry, does the content of the presented scale of descriptors meet FL*

communicative needs in this industry? Expert 2 gave a positive answer and specified some oral interaction skills presented as an ability to participate in an engineering dialogue. Thus, the findings of the final stage provide the answer to RQ4.

4.2. Validity

The concept of validity is key to research in many fields. Its definition largely depends on the subject of the study, objectives and selected methodology. Generally defined as "trustworthiness of inferences drawn from the data" (Eisenhart & Howe, 1992: 644), this concept may be associated with the degree to which the results obtained among study participants represent the general situation among the population under investigation (Finchman, 2008; Patino & Ferreira, 2018), selection and design of measuring instruments (Oluwatayo, 2012). In educational research, general criteria of validity include clear problem statement, appropriate research design, representative samples and homogeneity of measuring instruments (Eisenhart & Howe, 1992; Oluwatayo, 2012).

Taking the above into account, the validity of the present research can be proved by the following facts:

1. Duration of the experiment. It was conducted over a period of 2 years.
2. One hundred percent responsiveness (the number of valid questionnaires administered among students was equal to the number of received ones).
3. Sample representativeness. Study participants included students from two universities and represented different groups, academic years and courses of study. The instructors also represented two universities and had experience of working with different levels of English proficiency and different majors.
4. Teachers' involvement. The authors used the technique proposed by Yang (2020). At the stage of designing materials and teaching they worked as insiders, but were physically absent while the learners were completing the surveys.
5. High qualification of experts interviewed within the research.
6. Homogeneity of measuring instruments. All the questionnaires contained close-ended questions formulated in a similar way and had a limited number of identical response options.

5. DISCUSSION

The choice of the CEFR format was supported by the survey results among ESP teachers and students. The latter exhibited a high level of readiness to plan and assess their language acquisition. At the same time, it is difficult to attribute the absence of this wish, but the likely reason could be low motivation. This needs further investigation, which was beyond the present study.

The focus of the present research on A2 and B1 descriptors accords with the proposition of A2 as a minimum level after one or two years of teaching General English and ESP at an engineering university (Polyakova, 2011: 283), whereas B1 is offered as the target level for those universities where ESP courses may last up to three academic years (Miroshnikova, 2008).

One might ask a question: "Why should we design a new scale?" The reason is that Polyakova's (2011) 5-level scales of skills are a product of diversification of ESP teaching at engineering universities. Being based on specific types of engineering activities and communicative needs (depending on the frequency of cross-cultural contacts in companies), these 5-level scales correlate only with these factors and are not related to each particular level of higher education. Such specification of ESP teaching might become a desirable system of lifelong learning. Polyakova's scales and the ACPEL Portfolio (Durán et al., 2009) are very similar in terms of addressing engineering majors and professionals in general. The elaborated framework for assessing ESP competence at the bachelor level may become the first step to specifying ESP courses at engineering universities as the new descriptors refer to some basics of professional courses and outline the amount of professional knowledge, skills and experience which is necessary and sufficient for designing ESP syllabi and courses.

The findings also contribute to the possibility of further specification of the elaborated A1-B1 descriptors (Baryshnikova, 2014) for particular engineering majors in the future (Koryakovtseva, 2020: 15). This research also confirms that employing self-assessment grids alongside with other assessment tools allows to adequately assess the proficiency level (Little, 2005; Miroshnikova, 2008; North, 2014; Voskresenskaya & Polushkina, 2020). The implementation of the CEFR-based scale resulted in the positive students' feedback that proved their awareness of communicative needs and treating the proposed scale and self-assessment grids as tools for planning and assessment. Besides, the obtained outcomes make a contribution to materials development for ESP courses (Athanasiou et al., 2016) and the previous research (Astanina & Verbitskaya, 2017, Miroshnikova, 2008) in terms of how learners' self-assessment can stimulate their engagement in FL learning. The elaborated descriptors address Athanasiou et al.'s (2016) research question about the need to align ESP courses with the CEFR.

The results of the surveys among student participants allow us to conclude that the initial skills objectives and the further developed descriptors matched the learners' communicative needs as future automotive engineers. Implementation of the new descriptors into the learning process was welcomed by the learners, and both the scale and self-assessment grids proved to be helpful from their perspective. The validity of these tools as learning outcomes was confirmed by the experts' evaluation. To sum it up, all the research stages show how the proposed integrative ESP competence can be embodied in particular learning outcomes by adopting the CEFR format.

6. CONCLUSION AND PROSPECTS

This study contributes to elaborating CEFR-based descriptors for planning learning outcomes in the case of teaching undergraduate students of automotive engineering. A solution to the problem of designing learning outcomes, their format, and students' engagement into planning and self-assessing their skills was offered. Considering the essential data and the students' feedback for the development process, the researchers devised a framework for assessment and self-assessment in the context of teaching ESP to students of automotive majors. Its effectiveness for planning learning outcomes and assessment of integrative ESP competence were evaluated by two experts and explored from the learners' perspective.

A number of limitations in this study should be considered. First, although the A2 level is treated as a typical level of FL proficiency after one or two years of language learning in engineering universities, the proposed descriptors need to be accompanied by level A1 for assessing elementary proficiency in the professional context for those learners who studied a different foreign language at school. Similarly, higher levels are attainable after completing 4-year ESP courses in bachelor and master programs. In this regard, level B2 should be added because of the need to design learning outcomes for more advanced learners.

Second, the proposed scale of descriptors and self-assessment grids have only communicative language activities so far. Therefore, the initiated research should be helpful to devise descriptors for assessing language competences so as to obtain a complete picture. Although meant for future automotive engineers, this scale has a potential of being adapted to other engineering majors. All the data considered in the designing process and a detailed description of the research stages hint at a 'recipe' of how to develop relevant learning outcomes in ESP contexts.

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