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TECHNOLOGY FOR DEVELOPMENT OF SOFT SKILLS OF FUTURE ARCHITECTS

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Abstract. In the era of intensive development of AI technologies personal characteristics and soft skills are increasingly seen as competitive advantages for specialists. Research states that future architects require highly-developed critical thinking skills, problem-solving skills, team-work skills, creativity and vision, leadership. Though these skills are in high demand among students and employers, scarce research offers readily available technologies of soft skills development. Moreover, only 19% of academic staff intentionally incorporate tasks aimed at enhancing soft skills' development into their courses. This study proposes a technology of soft skills development embedded into teaching English language course implemented for future architects, focusing on raising awareness on soft skills. The authors aim to test a technology for soft skills development for future architects via customized training course and to analyze the feedback on its implementation. The authors conducted a literature review to identify specific soft skills relevant to future architects; created a technology based on student-centered approach and project-based learning; piloted the course on soft skills development based on the created technology during the 2023–2024 academic year; analyzed the course's feedback survey of 33 Bachelor students of the 3rd course with B2 level of Proficiency in English. The results showed positive feedback from students, with 91% expressing satisfaction with the content of the course and education process organization. Students noted the relevance of the course content, its practical orientation, and the informational value for further development of soft skills. Students also offered recommendations for modifying the course content and methods of presenting educational information. This study sheds light on the importance of integrating soft skills training into academic curricula to better prepare students for the demands of the job market. The insights gained from this study can be used to implement the technology offered for students across various fields.

Keywords: soft skills, students, future architects, technology, personal development, English for Specific Purposes (ESP), English as a Medium of Instruction (EMI)

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ТЕХНОЛОГИЯ РАЗВИТИЯ МЯГКИХ НАВЫКОВ БУДУЩИХ АРХИТЕКТОРОВ

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Аннотация. В эпоху активного развития технологий искусственного интеллекта личностные качества и мягкие навыки специалистов все чаще рассматриваются как конкурентные преимущества. Будущим архитекторам необходимо иметь высокоразвитые навыки критического мышления, навыки решения проблем, навыки работы в команде, творческое мышление, лидерство и быть визионерами. Однако, несмотря на высокий спрос на эти навыки со стороны студентов и работодателей,

в практике образования недостаточно исследований, описывающих технологии развития мягких навыков. Более того, только 19 % преподавателей вуза осознано включают задачи, направленные на развитие мягких навыков, в свои курсы. В данном исследовании предлагается внедренная в курс обучения английскому языку технология развития мягких навыков будущих архитекторов, в которой английский язык выступает не основной целью, а средством обучения. Цель исследования – разработать и апробировать технологию развития мягких навыков будущих архитекторов и проанализировать обратную связь по ее внедрению. Авторы провели обзор литературы для выявления мягких навыков, важных для будущих архитекторов; создали технологию на основе системного, личностно-ориентированного и проектного подходов; протестировали курс по развитию мягких навыков на основе разработанной технологии в течение 2023/2024 учебного года; опросили 33 студента бакалавриата 3-го курса с уровнем владения английским языком B2. Результаты показали положительную обратную связь от студентов, 91 % которых выразили удовлетворенность содержанием курса и организацией учебного процесса. Студенты отметили актуальность содержательной части курса, его практическую направленность и информационную ценность для дальнейшего развития мягких навыков. Студенты также предложили рекомендации по корректировке содержания курса и методов представления учебной информации. Данное исследование подчеркивает важность интеграции обучения мягким навыкам в академические программы для лучшей подготовки студентов к требованиям современного рынка труда. Результаты исследования можно использовать для разработки курсов по развитию мягких навыков для студентов различных направлений подготовки.

Ключевые слова: мягкие навыки, студенты, будущие архитекторы, технология, личностное развитие, английский для специальных целей, английский язык как средство обучения

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Introduction

In today's job market, having strong soft skills gives higher education graduates a competitive edge. Employers expect employees to possess creativity, resilience, effective communication skills, teamwork abilities, negotiation skills, conflict resolution skills, compromise-finding skills, innovation skills, and well-developed critical thinking skills [8]. The employers expect their staff possess social and cross-cultural skills to participate in international projects and effectively collaborate with people having diverse backgrounds [9]. Moreover, employers value developed skills in problem solving, critical thinking, and expect autonomy in decision making [8].

"Soft skills" is a term that is often used in opposition to hard skills. C. Grisi defines soft skills as the prerequisite hard skills that help graduates to adapt to ever-changing conditions of work life [7]. In the research literature, the term "soft skills" has synonymous concepts (social skills, social competencies, life skills, interpersonal skills, and people skills) that impede to give a precise definition to the term. Soft skills are often labelled 21st-century skills as they provide opportunities for the workforce to adapt to the ever-changing conditions of the employment market [2]. Vasanthakumari S. defines soft skills as "a cluster of personal qualities, habits, attitudes and social graces that make someone a compatible employee" [19, p. 67]. In our research we use the definition of A. Rodríguez Martínez et al who define soft skills as a set of socioemotional capacities and skills that people use in interactions and that are crucial to achieving personal and work success [12].

Though soft skills complement hard skills and are multifaceted as they can improve both professional careers and personal well-being, empirical research states that different specialists require a different set of soft skills nominated by employers and preconditioned by a specific professional environment. Our research focuses on the development of soft skills of future architects. Future architects have to develop both hard and soft skills as their profession is highly creative and based on social interactions. Creativity and innovative thinking are essential in architecture as they allow architects to come up with unique and original designs that stand out from the rest. These skills enable architects to think outside the box and push the boundaries of conventional design, ultimately leading to cutting-edge and groundbreaking projects. Critical thinking is also important in architecture as it helps architects analyze complex problems, evaluate different solutions, and make informed decisions that are both practical and aesthetically pleasing. By being able to critically assess various design options and their implications, architects can create spaces

that are both visually appealing and functional. Communication skills are another key aspect of success in architecture, as architects often need to work closely with clients, contractors, and other stakeholders throughout the entire design and construction process. Being able to effectively communicate design ideas, project requirements, and feedback is crucial for mutual understanding and that the project progresses smoothly. Additionally, leadership and teamwork skills are essential for architects to effectively manage their teams and collaborate with others to bring their ideas to life. By possessing a well-rounded set of soft skills, architects can not only excel in their profession but also make a lasting impact in the field of architecture.

The literature analysis showed limited research on specific soft skills essential for future architects. Salleh et al. state that the demand for architects that are able to successfully manage different projects is high, and, therefore, architectural firms are seeking applicants that possess soft skills with a focus on interpersonal and communication skills [16]. Project management is a complex activity that requires a set of skills that incorporate critical thinking, teamwork, leadership, creativity, innovative thinking, and the ability to initiate, manage, and implement a project. Thus, these skills may constitute the core of soft skills for architects. P. Wesołowski investigated how students in architectural engineering develop soft skills by means of the *studio* teaching method. He argues that creativity and innovative thinking are the soft skills that should be highly ranked among the set of soft skills for future architects [22]. T.S. Mari et al [11] define the soft skills for architects, focusing on communication, critical thinking, problem solving, and practice-related skills. In her empirical study, Magdalena Muszyńska-Łanowy [13] highlights the importance of cognitive flexibility, interdisciplinary thinking, analytical thinking, critical thinking, and creativity as essential skills for architects of the future.

Problem statement

Though soft skills are in high demand for both students and employers, universities have not yet succeeded to comprehensively integrate soft skills' development into university curriculum [14]. The focus of higher education programs on fostering the development of academic mindset of future graduates, unpreparedness of the academic staff to develop soft skills and the resistance of the academic staff to change traditional ways of teaching are the main obstacles [2]. Only 19% of university teachers develop soft skills when teaching special disciplines, while 73% of teachers do not take personal responsibility for developing students' soft skills [23]. Nevertheless, several ways to develop soft skills of future graduates have been described in the literature. Wayne K. in his dissertation study has offered four solutions to develop soft skills at university level. He has stated that soft skills can be developed via stand-alone course, coursework in a major, experiential learning and via general education programs [21]. Tang Keow Nganga et al [18] have suggested developing soft skills by embedding them into existing courses, thus, developing soft skills by integrating them into professional disciplines or by creating support extracurricular programs. Feraco et al argue that extracurricular activities can add to the successful acquisition of soft skills [5]. Moreover, students can develop soft skills in informal and non-formal education by taking online courses, reading self-development books, and attending soft skills trainings [22].

To integrate soft skills development into university curriculum effective education technologies are needed. The existing literature on soft skills training offers a number of approaches. Garcia et al [6] has proved that game-based learning is one of the methods to develop soft skills. Deep et al. [4] argues that problem-based learning is another effective way to develop cognitive abilities of students and their social skills. The researchers highlight the need for the interactive nature of methods offered for soft skills development that provide opportunities for active participation of students in the education process, suggest possibilities to make decisions and reflect on the consequences, like in series games [1] or employ to the full students' critical thinking abilities to solve various real life cases like in case-based instruction (CBI) [10].

An attempt to solve the problem on a national level was made by the government of the Russian Federation. In 2018, an online platform called "Russia is the country of opportunities" was created by President V.V. Putin. The project "Centers of Competence" has become part of the platform. Centers of Competence were established in leading universities in Russia to evaluate and develop students' soft skills. These Centers of Competence utilize the resources of the online platform "Russia is the country of opportunities" to offer online courses for developing

soft skills. The online courses offer lecture, pre-testing and summative testing. However, tests can only measure understanding and reproduction of lecture material. They are unable to develop higher-order thinking skills such as analytical thinking or creativity. As a result, few students are aware about the effective strategies of soft skills development [15, 20]. This fact showcases the need for finding effective technologies that enhance soft skills of university students.

The research on different frameworks of soft skills development provides scientists with a solid theoretical background, however, the empirical cases of technology implementation via general disciplines integrated into the curriculum are still scarce [3]. To bridge the gap, the authors offer a technology to integrate soft skills' development into teaching general discipline, namely, English language for future architects.

The study aims to develop and test a technology for soft skills development for future architects via customized training course. The objectives of the study are:

to define soft skills for future architects,

to create a technology for soft skills' development,

to implement the technology via an English taught course on soft skills

to analyze the students' feedback on the efficiency of the technology.

Methods and Materials

To define soft skills for future architects the authors used the methods of literature analysis and the analysis of data from the initial survey of 33 Bachelor students of Architecture. The initial survey allowed to find out the attitudes of Bachelor students to the importance of soft skills' development and to find out what specific soft skills are critical for future architects. The initial survey contained four questions. The students were asked: how important they thought the soft skills were for their career; what soft skills the students considered crucial for success in their profession of an architect; if they had special training program on soft skills' development at South Ural State University; whether soft skills development should be part of a higher education curriculum.

The next task of the research was to develop a pedagogical technology for soft skills training. Under pedagogical technology the authors understand a system of functioning of all the components of the pedagogical process, built on a scientific basis, programmed in time and space, and leading to the intended results [17]. To create a technology for soft skills' development the authors used system approach, person-oriented approach and project-based learning as the leading active method of teaching. System approach helped to present the education process of soft skills training as a system with interconnected components (education aim, education content, forms, methods, student-instructor interaction, education outcomes), to describe its elements, implementation stages. Person-oriented approach allowed to select the content of the education aimed to develop personal social traits and qualities of students and to serve as the basis for subject-subject interaction where students take active position in acquiring knowledge on soft skills and take responsibility for the education outcomes. Project-based learning was chosen as the leading method of instruction because it allows to embrace many skills that are in demand by employers today including critical thinking, creative thinking, problem-solving, working in a team, conflict resolution and emotional intelligence.

To implement the technology created the authors designed an English taught course on soft skills development that was realized within the discipline "English for Specific Purposes". To evaluate the efficiency of the technology offered the feedback survey on the course piloting was conducted. The feedback survey was aimed to find out if the awareness on soft skills was raised; if the students liked the content of the course and the methods of instruction; what modules of the course did they like most and what changes can be offered to modify the course, if needed. The feedback survey had 9 questions. The students were asked to rate the modules studied; to evaluate the course materials (texts, videos, communication exercises, self-assessment texts), assignments and activities, instructor's guidance.

The surveys were conducted online using Google forms. The distributed surveys were sent to the personal emails of the students and 33 answers were obtained.

Thirty-three bachelor's students of the South Ural State University participated in the course piloting. All the students studied at the 3rd course of Bachelor program. Their future specialty is Architecture. The level of English language proficiency is B2. The course "Soft Skills: 7 keys for a successful career" was piloted in 2023–2024 academic year. According to the academic plan, the piloting of the course was conducted during

5th and the 6th terms. The students had 3 double periods per week. They were held in specially equipped classrooms for foreign language training, so that the students could have interaction watching video, listening to the recordings.

Results

The authors defined a set of soft skills for future architects that include critical thinking, creativity and innovative thinking, communication skills, leadership, teamwork, emotional intelligence. These skills are considered crucial for success in the field of architecture. The results were obtained from the literature analysis of theoretical and empirical research on the development of soft skills for future architects and on the results of the initial survey conducted for 33 third year Bachelor students of Architecture.

The initial survey showed that 80,9% (30) of students considered soft skills important for their future career (Fig. 1). In class discussions the students were able to distinguish soft skills from hard skills and defined soft skills as the abilities and personal qualities that help to gain success in life.

When the participants were asked what soft skills they considered crucial for future architects, 88% (29) of students named creativity and vision, 85% (28) of students named critical thinking, 79% (26) choose teamwork. Emotional intelligence and communication skills gained 70% (23). 60% (20) of respondents stated that attention to detail is one of the critical features for architects. Problem-solving, flexibility and adaptability were chosen by 57% (19) of students. Intercultural communication took the last place. Only 36% (12) of students marked it as a crucial soft skill for architects (Fig. 2). The students ranked critical and creative thinking as the most important soft skills for future architects as in their jobs they have to process large amount of information and choose the best variants of architectural projects. Besides, to meet the re-

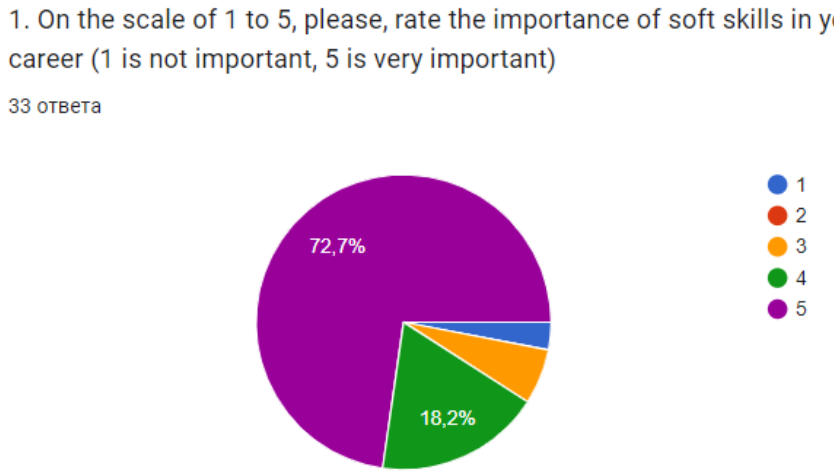

Fig. 1. The importance of soft skills

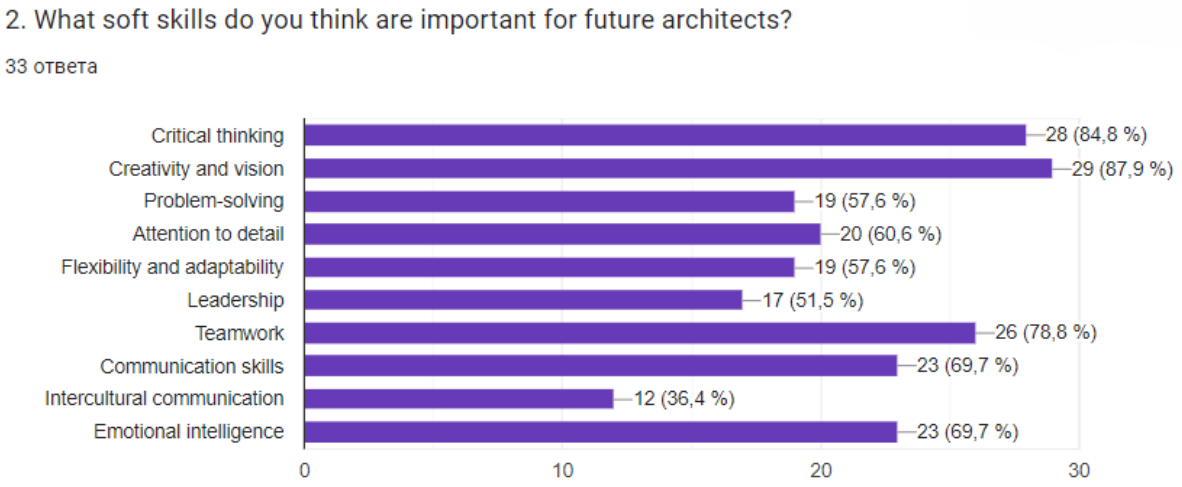

Fig. 2. Critical soft skills for future architects

quirements of customers with scarce resources architects have to be creative. The fact that intercultural communication was ranked as the least important soft skill for a career of a future architect can be explained by the social and economic situation in our country. The architectural industry is focused on the local and not international market nowadays. Nevertheless, we decided to include the module on intercultural communication in our course as we prepare students for the future. The situation can be changed for the better and the number of international projects where future architects have to work in international teams can be increased.

Though the respondents demonstrated high awareness on the importance of soft skills development most of them stated that they did not know about the possibilities to develop soft skills at South Ural State University. 82% (27) of students stated that they either did not know about the training programs on soft skills or answered negatively to the question (Fig. 3). It can be explained by the fact that though the university has a Center of Soft Skills development but it is at the initial stage of its development, so few programs are offered to the students and promotion of the programs needs to be improved.

The answers to the final question of the initial survey showed definite interest of the respondents to introduce the courses on the soft skills development into higher education curriculum. 91% (30) of students answered positively to the question and only 9% (3) of students showed hesitation (Fig. 4).

After defining a set of skills for future architects the authors created a technology for developing soft skills via general discipline, namely, English for Specific Purposes. The novelty of the education technology proposed by the authors lies in the fact that the focus in the learning process shifts to the development of soft skills, their components and strategies for their development,

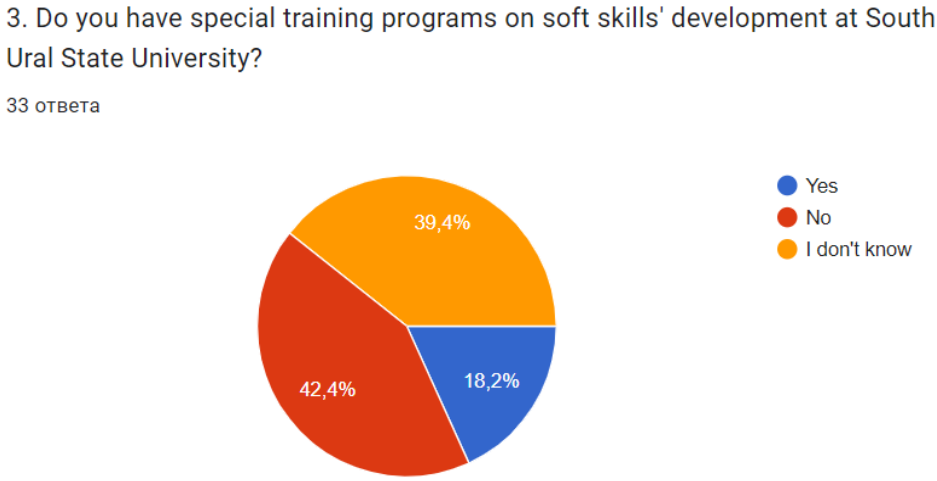

Fig. 3. Training programs on soft skills at SUSU

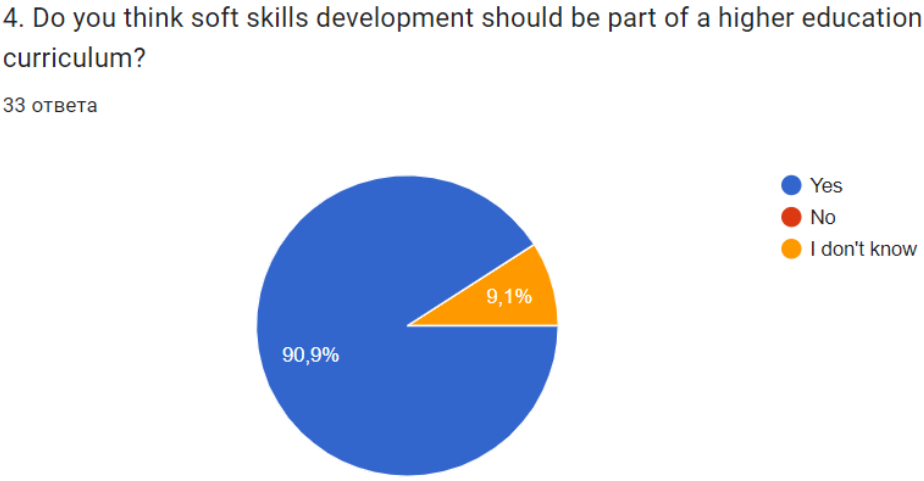

Fig. 4. Integration of soft skills into higher education curriculum

and English serves not as the goal, but as a means of education.

The goal of the technology to develop soft skills for future architects was to increase awareness of the component composition of each soft skill and to offer strategies for their further development. The technology was based on the principles of interdisciplinary knowledge (the learning content included knowledge from the fields of philosophy, psychology, intercultural communication, sociology), module structure (a learning module was developed for training each soft skill), dialog interaction (educational interaction was based on subject-subject relationships), reflexivity (each module included self-diagnostic tests), and context realization (soft skills were practiced in real situations). The structural components of the technology were the target, content, procedural, and reflexive components.

The stages of implementing the technology were motivational, communicative-practical, and reflexive-personal. The aim of the motivational stage of the technology was to form the students' motives for soft skills development via providing students with the knowledge about the components of each soft skill and their practical value, via self-assessment tests and active vocabulary learning for participating in classroom discussions. The aim of the second stage was to make students train their soft skills in education activities (debates, group discussions, brainstorming activities, case studies, group project work etc.). The aim of the reflexive-personal stage of the technology was to make students think about their strengths and weaknesses in terms of soft skills development and to assess the learning experience they had at the communicative-practical stage. At this stage the students complete individual tasks (writing an essay, making a presentation or an individual project work).

To implement the technology via an English taught course on soft skills the author created the course "Soft Skills: 7 keys for a successful career".

The course presents seven key soft skills: communication skills, leadership, critical and creative thinking, emotional intelligence, teamwork skills, and intercultural communication skills. The content of the course is presented in Table 1. The piloted course "Soft Skills: 7 keys for a successful career" consists of 8 modules.

After piloting the course, the students answered the questions of the feedback survey. The respondents rated highly the overall organization and structure of the course. 64% (21) and 27% (9) of students evaluated the course for an excellent and good marks (Fig. 5).

The distribution of the answers to the second question "What modules of the course did you like most?" are shown on Fig. 6.

The modules that were highly appreciated by the respondents were creative thinking (85% (28)), critical thinking (82% (27)) and emotional intelligence (76% (25)). The topic "conflict resolution" was part of the module "Teamwork", so all in all the around 70% (23) of the respondents showed positive attitude to the module content and activities. More than 60% (21) of students named

Table 1

Content of the course "Soft Skills: 7 keys for a successful career"

Units	Brief Content of the Units
Unit 1	Soft skills: basic concepts. Soft skills self-assessment tools
Unit 2	Critical thinking. Critical thinking skills. Building an argument. Strong and weak arguments. Strategies to develop critical thinking skills
Unit 3	Creative thinking. Myths about creativity. Creative, divergent, convergent and design thinking? Strategies to develop lateral thinking skills
Unit 4	Communication skills. How to establish contact with different people? How to speak so that people will listen to you? How to avoid manipulation in communication? How to give a TedTalk presentation? How to present yourself? Strategies to develop communication skills
Unit 5	Basic theories of leadership. Basic leadership styles, their advantages and disadvantages. Strategies to become a better leader
Unit 6	Team concept. Techniques for resolving conflict situations in a team. Strategies to develop teamwork skills
Unit 7	Emotions and their meaning. How to express and manage your emotions using body language and nonverbal communication? How to control your feelings in difficult situations? Strategies to develop emotional intelligence
Unit 8	Intercultural communication. The concept of culture shock and coping strategies. Ways to resolve cultural conflicts. Strategies to develop intercultural communication skills

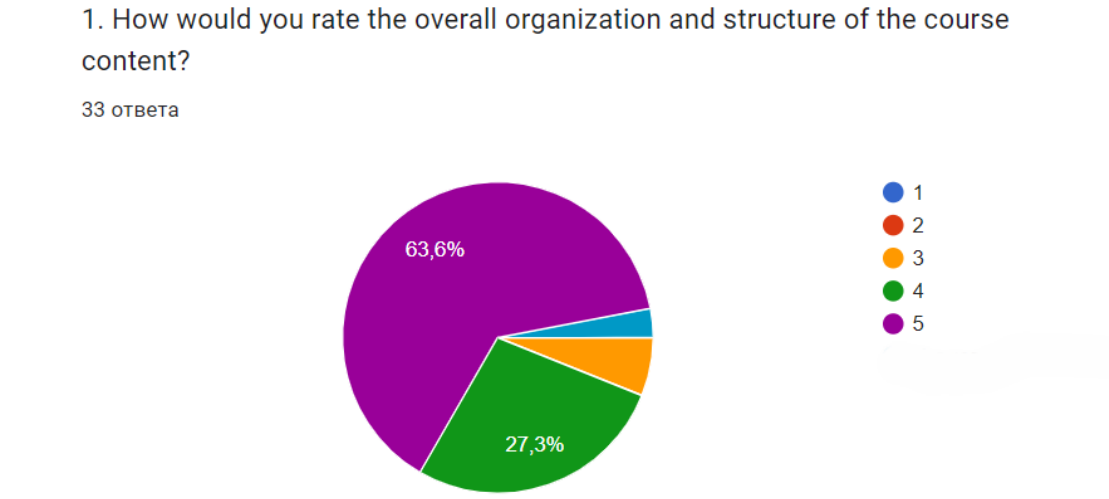

Fig. 5. Evaluation of the course content

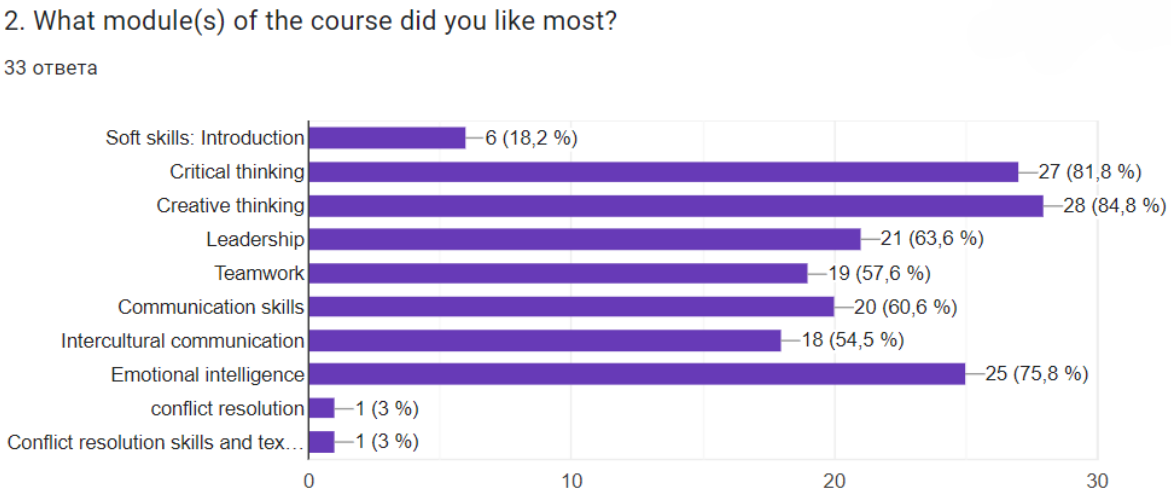

Fig. 6. Evaluation of the course content

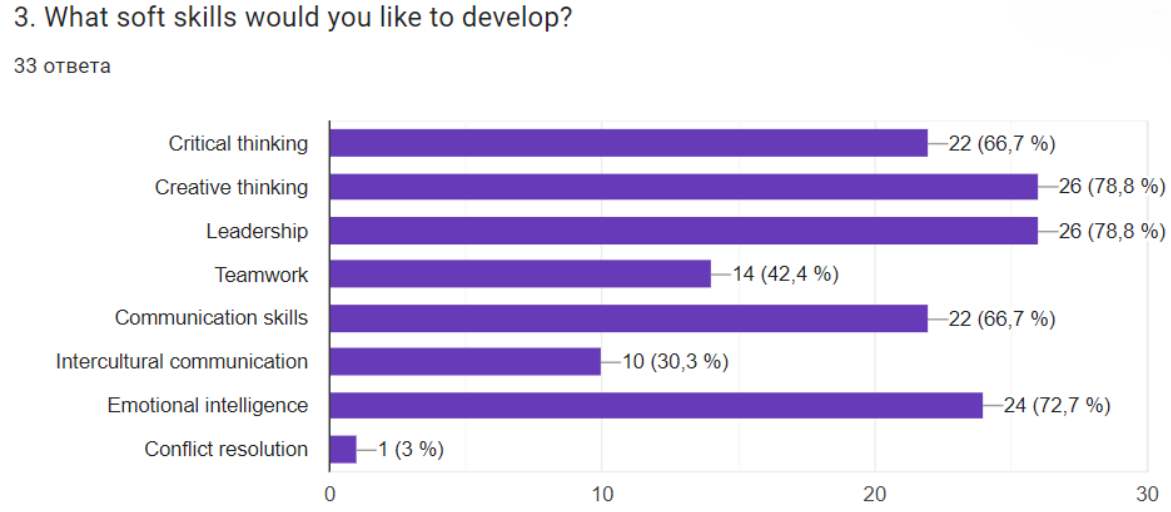

Fig. 7. Soft skills the respondents want to develop

the module on Leadership as the one they like most. The lowest interest by the results of the feedback survey was given to the module "Soft Skills: introduction". It can be explained by the fact that the focus of this module was on the theoretical issues defining the concept and importance of soft skills development and the information was new for the learners.

Interestingly, when asked what soft skills the respondents wanted to develop creative thinking, leadership, emotional intelligence and critical thinking were marked as priorities (Fig. 7). These results correlate with the answer to the question on the modules the students liked where the same soft skills were stated.

The main objectives of the course were to raise awareness of the students on the importance of soft skills development and to offer strategies for their development. The authors realized that the course "Soft Skills: 7 keys for a successful career" can be just a starting point for soft skills development and can show a way for the students to realize their own limitations, strengths and weaknesses. The answers to the fourth question of the feedback survey showed that the objectives of the course were reached as 79% (26) of respondents answered positively to the question "Were the course materials and resources helpful in raising awareness about soft skills?" (Fig. 8). Only 9% (3) of respondents gave negative answer to the question. The reasons for this may be low interest of some students to soft skills development or by the fact that not all the materials were adapted to the background and age of the students. This may be one of the areas the course can be improved.

The majority of the respondents 87% (29) positively evaluated the assignments and activities in the course that were helful in developing soft skills (Fig. 9).

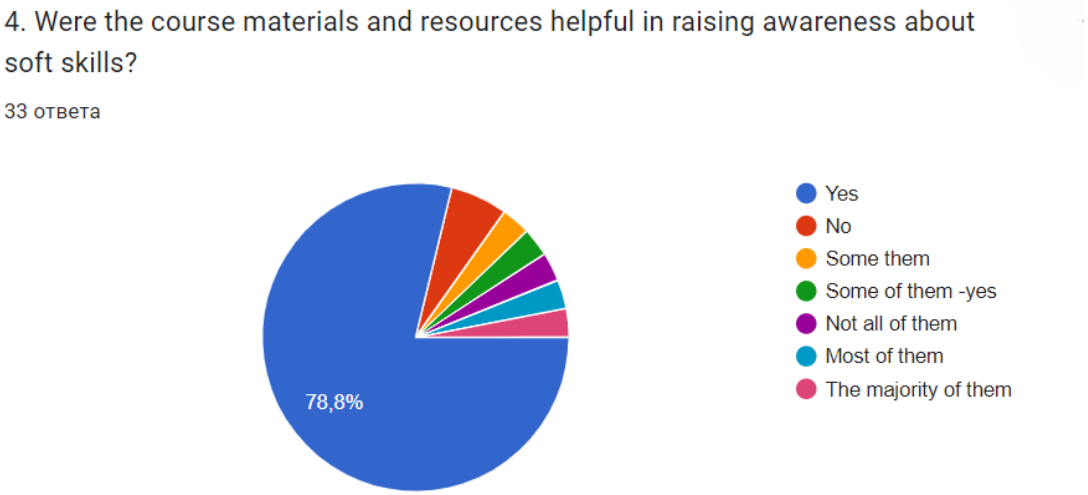

Fig. 8. Course materials' evaluation

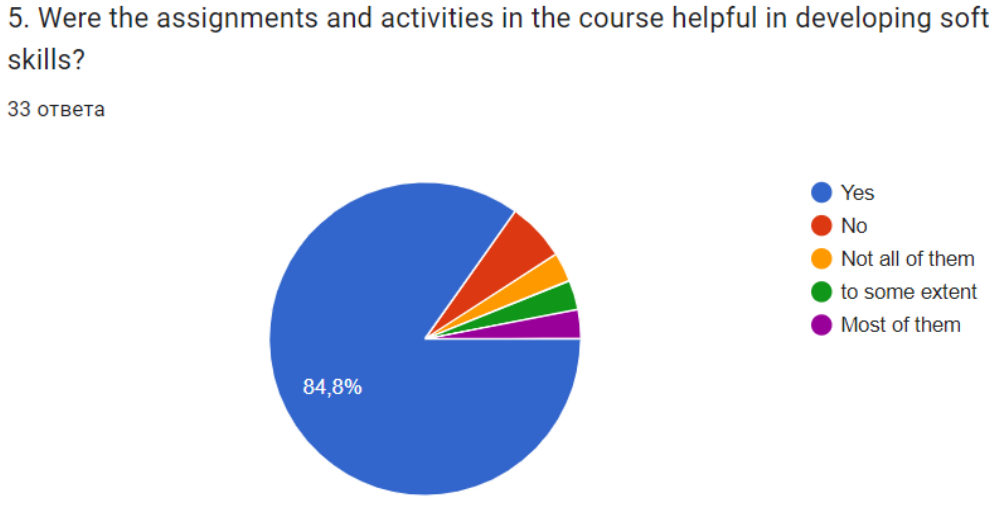

Fig. 9. Assignments' evaluation

In classroom interactions the students studied the active vocabulary that helped them to organize communication and discuss soft skills, watched videos, participated in discussions with a teacher and in small groups, perfomred projects like Johari window that made them reflect on their own personalities and discover the features the students needed to upgrade.

All the respondents 100% (33) positively evaluated the pedagogical support provided by the instructor (Fig. 10). It can be explained by the student-centered approach to teaching used in the classroom, by the usage of peer learning and the communicative approach in language teaching.

The respondents were offered to evaluate the elements of the course that supported their learning. Here we obtained interesting results. Most students 85% (28) marked watching videos as the most interesting elements of the course and the least interesting activities were reading texts (Fig. 11). Only 18% (6) percent of the students admitted they liked the course texts. One of the explanations is that Gen Z students prefer diversity and representation that is given by videos as different speakers presented their points of views on soft skills development, thus, traditional formats of texts representation were considered boring for the respondents. The other elements of the course that were highly evaluated by the respondents were tests on self-assessment (76% (25)), group discussions (76% (25)), teacher-student interaction (57% (19)) and speaking tasks (57% (19)). These results show that the respondents prefer an interactive mode of learning each with other, with the teacher and with the learning material.

After the evaluation of the course elements the respondents were asked about the suggestions to improve the course content and delivery. The students offered to adapt the course texts and make some texts shorter and easier to comprehend; to add the training tasks to develop soft skills; to add tasks for group and teamwork; to add speaking tasks and real-life cases.

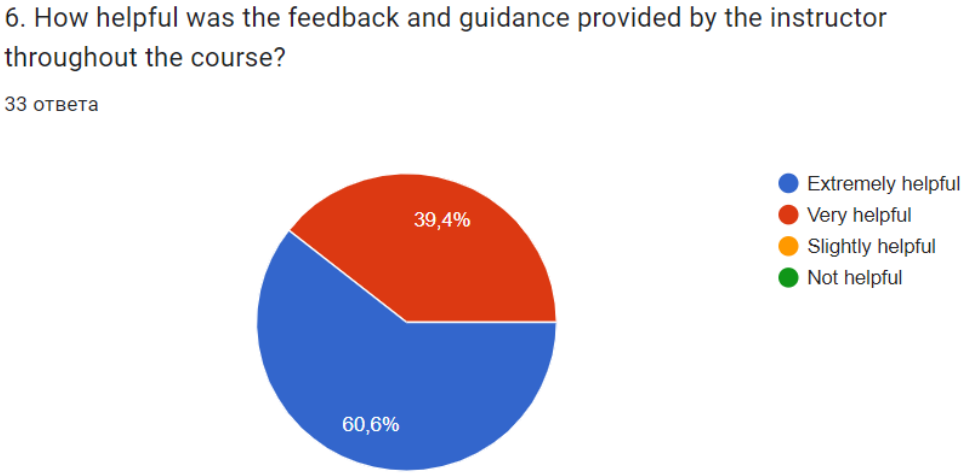

Fig. 10. Instructor's guidance evaluation

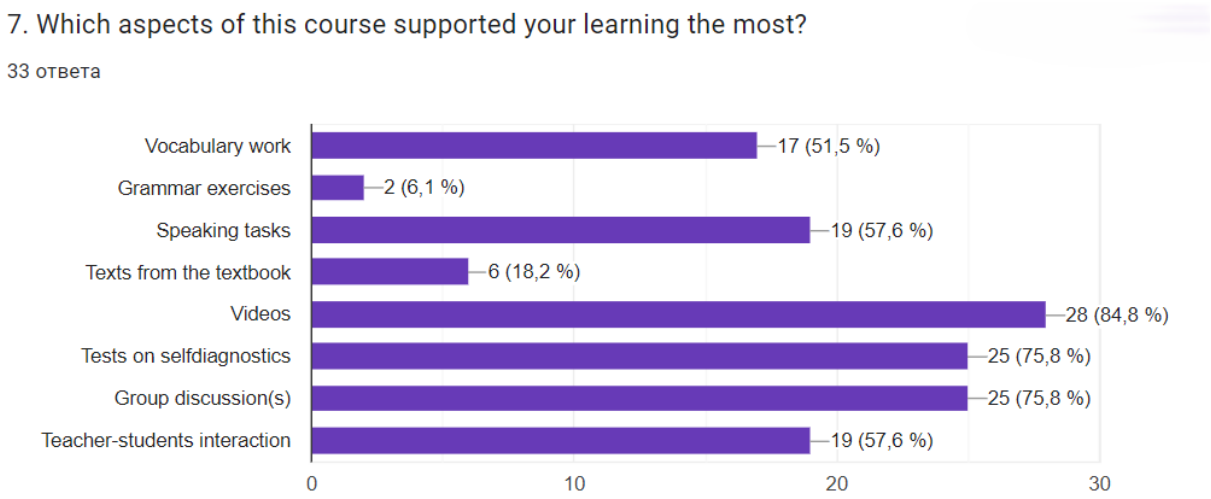

Fig. 11. Course aspects' evaluation

The final question of the feedback survey was "Would you encourage other students to take this course?". Though the respondents stated the areas for the course improvement, 100% (33) of them showed agreement that the course on soft skills development may be offered to other students.

Conclusion

The development of soft skills among university students is a pressing issue, especially given the competitive nature of the job market. Equipping graduates with both hard and soft skills can give them a significant advantage. This requires a concerted effort from university teachers to incorporate soft skills training into the curriculum. The lack of technologies to develop soft skills in higher education is a problem that needs to be addressed. In response, the authors of this study offered a technology on soft skills development tailored specifically for future architects at the Bachelor level. To implement the technology via an English taught course on soft skills the author created the course "Soft Skills: 7 keys for a successful career".

The feedback from students who participated in the course was positive, with 91% expressing satisfaction with the content and organization. They found the course to be relevant, practical, and beneficial for their soft skills growth. Students also expressed a desire for further development in this area and provided suggestions for course improvement. The insights gained from this study can be used to create similar courses for students across various disciplines. Future research should delve into the preparedness of academic staff to deliver soft skills courses and determine which specific skills are most beneficial for students in different fields.

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