

Soft Skills Enhancement through Interdisciplinary Students Engagement

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Abstract—There is a constant need for graduates who possess the skills that are highly sought by employers and can contribute to successful business development. Successful activity of a specialist is conditioned by two categories of skills: hard and soft skills. When talking about hard skills, we refer to direct technical knowledge. On the opposite, soft skills refer to communication, team work, creativity, problem solving and other personal skills. Experts agree that beside hard (technical) skills, soft (also called people-) skills are necessary. The research presents the basic groups of soft skills an engineer specialist needs for a successful professional activity: basic communication skills, self-management skills, skills of effective thinking, management skills. This paper calls for the development of soft skills through the interdisciplinary form of the educational process in order to increase the employability of graduates. We considered intrapersonal, interpersonal and systemic levels of interdisciplinary students' engagement which are relevant to the soft skills groups. The appropriate organizational form for these skills development is an interdisciplinary project team, which facilitates the acquisition of the soft skills. In other words, it is necessary to imitate working environment in the educational process to equip students with the skills required.

Keywords—*interdisciplinary; project team; soft skills; creative thinking; employability; educational environment.*

I. INTRODUCTION

The dynamic processes of modern society development, changes in the world education, characterized by the tendency to create a single educational environment, a change of generations and the needs of subjects of education have forwarded a review of students' preparation in order to increase their competitiveness in finding employment. Increasing requirements of employers forced researchers to pay attention to the insufficiency of academic knowledge and professional competencies, the so-called hard skills, when looking for a job. Multitasking has become a determinant direction in all professional fields, which confronts specialists

with problems that do not have a solution algorithm. So, there is a need for special mechanisms for employees adapting to constant changes and additional knowledge and skills that function as soft skills.

II. THE CONCEPT OF SOFT SKILLS

The term "soft skills" is one of the determinants of dynamically changing educational and working environment. The problem of soft skills development at different times was in the focus of many scientists, who examined and defined the concept of soft skills in different ways. It can be explained by the peculiarities of perception and the sphere of scientific interests of each of them. Theoretical analysis of research on soft skills allowed us to identify some areas and definitions that contribute to the understanding of this concept.

To the leading skills of the XXI century personality, T. Yarkova, relates "the critical nature of thinking and activity; openness to everything new and ability to navigate in it; communication skills; the ability to find and process information; the desire to master one's knowledge constantly, etc." [1].

Other researchers point out the unsophisticated nature of soft skills, their career-critical, super-professional level, which is responsible for successful participation in the workflow, high performance, and explains that these skills are not related to a specific subject area and common for all professional spheres [2].

O. Abashkina understands soft skills as "human qualities, without which even the best professional cannot achieve a good result ..." [3]. O. Barinova considers the development of soft skills within the competence-based approach and focuses on the fact that these competences acquired by students are a specific means of the employer-university communication which aims at meeting the requirements of modern labour market implying a certain set of soft skills [4]. Soft skills are

thought to be the skills of effective communicators and leaders, necessary both in everyday life and in professional activities [5]. According to V. Davidova, “soft skills” are skills acquired through additional education and personal life experience and used for personal development in professional activities [6]. Soft skills are considered to develop in the process of professional interpersonal relations, which involves the inclusion in the working and organizational contexts of an enterprise, understanding and representing corporate interests, setting and solving professional tasks [7]. I. Kanardov explores the psychological component of soft skills and considers the ability to persuade, find an approach to people, leadership, interpersonal communication, managing negotiation processes, teamwork, personal development, time management, erudition, creativity, etc. [8]. Y. Portland follows the similar idea and defines “soft skills” as social skills that make it possible to establish interaction with different groups of people [9]. According to A. Ivonina, O. Chulanova, Yu. Davletshina, soft skills should be considered as “soft competences”, which are characterized by the development in different professional activities and the presence of which causes “employers’ close attention to admission to work and to the formation of the competence model for various positions” [10]. For O. Sosnitskaya, soft skills are communicative and managerial talents, which, according to the author, include “the ability to persuade, lead, manage, make presentations, find the right approach to people, the ability to solve conflict situations, public speaking” and are inherent in all professional fields [11]. D. Tataurschikova understands “soft skills” as unified skills and personal qualities that contribute to improving work efficiency and interaction with other people, referring to these skills as “personal development management, ability to manage your time, persuade, negotiation skills, leadership, etc.” [12]. V. Shipilov considers “soft skills” as “socio-psychological skills: communicative, leadership, team, public and others”. He believes that these skills can be useful in most life situations and are associated with the social interaction [13]. I. Milevski to describe soft skills uses the concept of emotional intelligence, which is determined by “the person's ability to correctly read the situation, to grasp what other people need, to know their strengths and weaknesses, not to give in and to be attractive to others” [14].

Analysis of practical researches conducted by Harvard University, the Carnegie Foundation and the Stanford Research Institute show that the success in the professional sphere depends on the level of “soft skills” by 75–85%, and on hard skills only by 15–25% [15, 16]. In 2015, the Organization of Economic Cooperation and Development published a report on the results of a three-year research entitled “Skills for Social Progress. The Power of Social and Emotional Skills”, which also emphasizes the exceptional importance of graduates’ emotional and communicative qualities for their further professional advancement [17]. The report notes that these qualities have priority over academic performance.

American and Russian employers’ opinion and views have been analyzed. Thus, the results of the research conducted in the US by the National Association of Colleges and Employers (NACE) show that a high average score is still

taken into account when applying for a job, although only high marks are not enough for this. For example, employers require the applicant to have a relevant work experience.

Among other “non-technical” qualities that employers look for is the ability to “be a successful and active member of today's global economy” [18].

In 2010, NACE surveyed the opinion of 219 employers and it turned out that 49.7% of them consider communication skills to be the most demanded ones, whereas it is precisely what graduates lack. 28.9% of employers noted a low level of initiative among university graduates, 27% - inability to work in a team, 20.8% - lack of professional ethics, 11% - need for analytical skills, and only 8.7% pointed out the lack of professional skills. There was also a doubt about the effective development of writing skills [19].

III. SOFT SKILLS CATEGORIES

In 2016, at the International Economic Forum in Davos, a list of the most demanded competencies in 2020 was given. The top skills are the ability to solve complex tasks, critical thinking, creativity, teamwork skills and emotional intelligence. Speaking about the skills of the future, the founder of the ATC21S research project and director of the Center for Evaluation Research at the University of Melbourne, P. Griffin noted that “in each country the set of [skills] differs, but it always relates to the skills needed in the 21st century - critical thinking, communication and teamwork skills, creativity, behavior in the digital environment” [20]. The skills in question are also known as 4 C’s: Creative thinking, Collaborating, Communicating, Critical thinking. According to many experts, the professional success of a graduate and the possibility of the society progressive development are based on these four notions.

The “clip” nature of the modern world has promoted the identification of four groups of soft skills in the system of psychological and pedagogical personality assessments:

- basic communication skills, or communication literacy (ability to listen, convince and argue, negotiate, make up presentations; public speaking, self-presentation, teamwork, focus on results, business writing, etc.) that help people develop relationships, keep the conversation going, behave effectively in critical situations when communicating with others. What students gained as a result of these skills development is how to ask and respond appropriately, how to be assertive when exchanging opinions with team members, how to make team work contribute to a successful outcome of the project, how to write reports based on the findings.

- self-management skills (emotions and stress control, personal development, planning and goal setting, time management, enthusiasm, initiative, perseverance, reflection, the use of feedback), which help to control the state, time and working processes. Students learned how to be more perceptive and sensitive to the needs of others in the team working process, improved their social skills by meeting and talking to representatives from different companies, reflected on the personal achievements and their value to the team work.

- skills of effective thinking, or intellectual thinking (creative, structural, logical, tactical and strategic thinking, searching and analyzing information, developing and making decisions), which are responsible for managing mind processes. Team members were motivated to speak and forward ideas and opinions while identifying problems and solutions, judged different views among other students and drew conclusions from the findings.

- management skills, or foresight management (management of execution, planning, setting tasks, motivation, monitoring the implementation of tasks, coaching, giving feedback, managing projects) - responsibility for planning, motivating, managing personality changes, etc. Students gathered information for the project, learned from what point of view to analyze it and identified relevant ideas regarding the goals set, brainstormed and forwarded ideas appropriately, team members were confident to give suggestions freely among others [21,22].

IV. THE POTENTIAL OF INTERDISCIPLINARY TEAMWORK

In the context of the engineering education modernization that meets the modern interests of business development and the level of scientific and technological progress, the tasks of raising and developing the graduates competencies based on practice-oriented education are becoming significantly important.

The need for an interdisciplinary approach and engagement is dictated by the conditions of modern society, since it is interdisciplinary engagement that is understood as a necessary condition for successful research work. Interdisciplinary research has enormous potential for stimulating research, putting results into practice and optimizing communication. Interdisciplinary is connected with the ability to approach any task comprehensively, and allows one to study what is impossible to see, to perceive within the limits of the scientific discipline itself with its specific object. The growth of knowledge is not possible without integration, without the mutual influence of various scientific branches, "points of growth" are formed at the junction of scientific disciplines in the "border areas" of knowledge. Pedagogical studies of interdisciplinary are the most extensive and concentrated mainly around the problem of improving the quality of education by ensuring the systematic educational content, which is reflected in the documents of the Bologna process, where interdisciplinary is highlighted as one of the desirable signs of a new quality of higher education.

Successful integration of ideas and forms of learning allows to achieve desirable results. An interdisciplinary project is the optimal form and one of the ways to emphasize the principle of education integrity and interdependence of disciplines, helps understand that many problems can be solved if considered from the point of view of different disciplines, as well as realize that knowledge and skills acquired during the study of one disciplines may facilitate the study of another one.

The idea of the discrepancy between the social form of the culture existence and the individual form of its appropriation by a man says in favor of the search for practice-oriented

forms of education. The basis of this contradiction is presented by the fact that the mental development of a person occurs in the dialogue and interaction with other people. Thus, the successful formation of social competences (soft skills) is possible only in the conditions of cooperation between the subjects of learning and is the result of their joint learning activities. A. A. Verbitsky [23] However, the traditional system of the educational process organization is characterized by the dominance of the frontal forms of work that are of an individual character.

The traditional way of teaching does not form students' personality traits that are especially necessary in modern life. These qualities include responsibility (the ability to take a leadership role and generate enthusiasm in people), creativity, critical thinking, communication skills and the ability to express their thoughts, courtesy, etc. [24].

V. THE CONTENT OF INTERDISCIPLINARY TEAMWORK

The interdisciplinary project organized in Samara State Technical University is how to learn a foreign language by means of augmented and virtual reality. We became interested in the idea of AR and VR in the process of learning a foreign language, since the introduction of such a project into the educational process is one of the new forms of teaching a foreign language that will improve the existing educational model today and bring it as close as possible to situational reality. The rationale for the choice of this project idea is conditioned by the relevance of information technologies application in education and the need to learn a professionally-oriented foreign language, which together should lead to the creation of innovative methodological support for the educational process. Besides we observed that "current student generation is interested in achieving the information in a different way. The books and notes are not primary in their interests, and characteristics of Z generation are present: they live in a symbiosis with the digital universe, they like studying in the virtual environment, they grow along with the online world and are willing to build a life correlated to it. They very well know where and how to find the information, wish to be active part of it, to be on Youtube and video blogs. They spend over three hours per day on the computer, developed short term attention, they rather scan than read, do not wish to read but interact on social networks. They do not do sport activities but enjoy video games, they are not obedient but ambitious and at the same time independent and pragmatic." [25].

An interdisciplinary team consisting of teachers, experts and students was created to realize the project. The key factor of our project is its interdisciplinary nature, which explains the participation of students from different departments - Information Technology, Customs, Management and Graphic Design.

VI. EXPERIENCE SHARING

In order to optimize the scientific component of the project the coordination of joint work and the acquisition of new knowledge in the framework of virtual reality, we organized meetings with several research and innovation companies. The

Center for Breakthrough Research of Samara State Medical University was among them, where our team members got acquainted with developments based on simulation technologies, cognitive technologies and augmented reality technologies. Using 3D glasses students “visited” the virtual hospital, with the help of the program “Virtual Surgeon” conducted a series of heart operations and also studied 3d anatomy atlas of the human body. The cooperation with one of the leading Moscow companies dealing with 3D technology, Play Display, turned out to be a very useful and interesting one. Our team members participated in master classes and worked out individual training plans and project development. The teachers involved in the project visited the largest exhibition of innovations in the educational environment in Hong Kong and studied the global trends in the development of new teaching technologies (including virtual and augmented reality technologies, educational platforms, gaming educational technologies). It was useful to establish contacts with foreign colleagues interested in designing new technologies and software to discuss issues of teaching English with The use of ICT, including the tasks of developing and introducing modern technologies at various levels (virtual reality, augmented reality) into the educational environment.

VII. THE CONDITIONS OF SUCCESSFUL INTERDISCIPLINARY TEAMWORK

Working experience in the interdisciplinary project allowed us to identify several conditions for successful interdisciplinary interaction:

- stable working relationship. To work effectively together, team members need to maintain a respectful and trusting attitude towards each other. Such mutual support is expressed in active listening to all colleagues, open communication, discussion of personal experience and different points of view. Group members should be dependent on the time of meetings and tasks assigned to them, understand and accept responsibility for their mistakes. The mutual favorable attitude and respect of people working together motivates each team member to work more efficiently;

- common goal. The motivation and productivity of team members are maximized by developing a common goal. At the same time, team members should be aware of and be ready to carry out the tasks assigned to them to achieve a common goal. This helps evaluate achievements periodically and discuss intermediate results, brainstorming, etc.;

- effective conflict resolution. Misunderstandings and conflicts are inevitable in any team when performing complex tasks. Interdisciplinary means upholding individual positions and decisions by team members, and it often provokes some intension in relations. Therefore, it is necessary to listen to everyone, to bring convincing arguments in expressing one's opinion, to reformat the situation of misunderstanding into clarification of goals. Effective conflict resolution is necessary to maintain working relationships;

- adequate time. Effective interaction requires adequate execution time for group and individual tasks. Otherwise, conflicts arise, responsibilities and obligations are reduced, and relationships break down;

- used technology. If the technology you are using does not work, or does not work correctly, then this causes the team to be confused. A possible solution to this situation is additional training and intergroup interaction;

- clear distribution of roles. It helps clarify the tasks, powers and responsibilities of each team member.

If these conditions are met, the teamwork comprises all the necessary aspects ensuring the product development in creative and scientific way.

VIII. THE LEVELS OF INTERDISCIPLINARY TEAMWORK

To get the project result in the form of the final product, the project team will have to experience interdisciplinary interaction at various levels. Scientists dealing with the problems of interdisciplinary teams distinguish 3 levels of interaction: intrapersonal, interpersonal, and systemic. Intrapersonal is an independent educational and research work, an in-depth study of individual problems of professional activity, contributing to the development of certain skills and character traits in solving scientific and practical problems. Interpersonal - is associated with interaction within the project team. And systemic is the level of going beyond the team, the so-called inter-project interaction. Properly built work at each of these levels leads to effective interdisciplinary interaction, which is the basis of scientific innovation. The collaboration of professionals from different subject areas in one team creates a unique forum of new ideas and perspectives, fresh solutions. Intellectual mutual enrichment arising from such interdisciplinary interaction is a catalyst for scientific innovation in future.

Interdisciplinary teamwork is primarily interpersonal interaction due to the motivation and interests of each team member. Therefore, there are many examples of inefficient work of such teams. The reasons may vary from interpersonal disorders to serious group conflicts. In this regard, special attention should be paid to group dynamics, processes and role functions, leadership, as well as environmental factors and context. So, we tried to approach the work in our group as carefully as possible, and at the initial stage, with the aim of effective interaction, we were engaged in creating a cohesive team. To achieve the goal, a series of master classes was held with a professional business coach, which covered such important issues as roles distribution in a team, working time organization, goals setting and types of control, motivation, etc. During these master classes, the students pointed out their priorities while defining the objectives for the day, month or year, worked in pairs, played situational dialogues, expressed their opinions on a particular topic. This clearly helped students develop communication skills when working in a group and assign the roles in a team.

IX. CONCLUSION

The theoretical analysis shows that there is no common definition of the term "soft skills." However, all researchers agree that these are people-oriented and self-management skills. In other words, these skills relate to a person's ability to work in different working environments alone or with other

people. The need for these skills is not new, but since changes in work organization are currently taking place in various enterprises and companies, the service sector is growing, teamwork is being paid much more attention than before. It is possible to develop soft skills within all professional disciplines, imitating working environments in class.

The optimal condition for soft skills development is interdisciplinary students' engagement. We conclude that the potential of the interdisciplinary is in its resources, represented by ideas and approaches from different areas, and the possibilities of creating new knowledge and increasing the level of scientific knowledge. The methodological tasks of the interdisciplinary teamwork are correlated with the task of soft skills development – to encourage productive communication on the basis of the information exchange, since it stimulates skills of critical and creative thinking; skills of teamwork and independent involvement in problem solving; leader skills; flexibility and adaptability.

References

- [1] T. Yarkova, I. Cherkasova, "Students' soft skills formation in conditions of realization of the teacher's professional standard", *Vestnik Tjumen' State University, Humanitarian researches*, vol. 2, № 4, 2016, pp. 222-234.
- [2] L. Lippman, R. Ryberg, R. Carney, A. Kristin, "Workforce connections: key "soft skills" that foster youth workforce success: toward a consensus across fields", *Child Trends Publication*, p. 56, 2015.
- [3] O. Abashkina, "Soft skills: key to the career", URL: <http://www.personal.ru/article/7811-soft-skills-klyuch-k-karere>.
- [4] O. Barinova, "The notion and the essence of the competence", URL: <http://novainfo.ru/article/1935>.
- [5] E. Gajduchenko, A. Marushev, "Emotional intelligence", URL: <http://l-a-b-a.com/lecture/show/99>.
- [6] V. Davidova, "Listen, speak and negotiate: what soft skills are and how to develop them", URL: <http://theoryandpractice.tu/posts/11719-soft-skills>.
- [7] N. Zhad'ko, M. Churkina, "Teaching hard skills and soft skills – what is the difference?" URL: <http://hrportal.ru/article/obuchenie-hardskills-i-soft-skills-v-chyom-raznica>.
- [8] I. Kanardov, "Soft skills and hard skills – what is the difference?" URL: <http://www.znai.su/statya/soft-skills-i-hard-skills-%E2%80%93-vchem-raznica>.
- [9] Yu. Portland, "What is soft skills and why are they important for career?" URL: <http://dnevnyk-uspeha.com/rebota-ikarera/chto-takoe-soft-skills-i-pochemu-oni-tak-vazhnyi-dlya-kareryi.html>.
- [10] A. Ivonina, O. Chulanova, Yu. Davletshina, "Modern trends of theoretical and methodic techniques in management: the role of soft skills and hard skills in professional and career development of employees", on-line journal "Science studies", Vol. 9, №1, 2017, pp. 1-18. URL: <http://naukovedenie.ru/PDF/90EVN117.pdf>.
- [11] O. Sosnitskaya, "Soft skills of hard nature". URL: <http://best.ru/blog/13>.
- [12] D. Tataurschikova, "Soft skill", URL: <http://4brain.ru/blog/soft-skills>.
- [13] V. Shipilov, "The list of soft skills and the ways of their development", URL: http://www.cfin.ru/management/people/dev_val/soft-skills.shtml.
- [14] I. Milevsky, "Personal development of a successful man", *Principles of soft skills*, URL: <http://ecouniver.com>.
- [15] P. Klaus, "Communication breakdown", *California Job Journal*, No. 28, 2010, pp. 1-9.
- [16] M. Watts, R. Watts, "Developing soft skills in students", 2008, URL: http://108.cgpublisher.com/proposals/64/index_html.
- [17] OECD, *Skills for social progress: The power of social and emotional skills*, OECD Skills studies, OECD Publishing, 2015. URL: <http://dx.doi.org/10.1787/9789264226159-en>.
- [18] G. Hasanova, "Employers' requirements to technical universities graduates", *Vestnik of Kazan' Technological University*, № 20, 2012. URL: <http://cyberleninka.ru/article/n/trebovaniya-rabotodateley-k-vypusnikam-inzheneryh-vuzov>.
- [19] N. Betz, G. Hackett, *Journal of Career Assessment*, №14 (1), 2006, pp. 3-11.
- [20] P. Griffin, Shkolam nuzhny analitiki, URL: <http://www.edutainme.ru/post/griffin/>
- [21] S. Batsunov, I. Derecha, I. Kungurova, E. Slizkova, "Modern determinants of soft skills development", *Concept*, № 4, 2018. URL: <http://cyberleninka.ru/article/n/sovremennye-determinanty-razvitiya-soft-skills>
- [22] F. Musa, N. Mufti, R.A. Latiff, M.M. "Amin Project-based learning (PjBL): inculcating soft skills in 21st century workplace", *Procedia – Social and Behavioral Sciences*, № 59, 2012, pp. 565-573.
- [23] A. Verbitskij, "New educational paradigm in Russian education", *Education and science*, № 60, 2012, pp. 5-18. DOI: 10.17853/1994-5639-2012-6-5-18
- [24] V. Djachenko, *Didactics*, vol. 2, Moscow, vol. 1, p. 400, 2006.
- [25] I. Simo, "Exploitation of open educational resources in engineering education – Purpose of Research", *Bulletin of Transilvania University of Braşov*, vol. 10(59), no. 1, Series I: Engineering Sciences, 2017.