

14. Dictionary.com. Meanings and Definitions of Words. Retrieved from: <https://www.dictionary.com/> (date of access: 5.10.2020).

15. Dictionary of the Scots Language. Retrieved from: <https://dsl.ac.uk/> (date of access: 21.09.2020).

16. Richard Oliver Heslop. Northumberland Words. A Glossary Of Words Used In The County Of Northumberland And On The Tyneside. London: Published for the English dialect Society by K. Paul Trench. Trübner, 1892. 344 p.

17. Stoker B. Bram Stoker's Notes for Dracula. A Facsimile Edition, R. Eighteen-Bisang, Elizabeth Miller. McFarland & Company, Inc., Publishers, 2008. 342 p.

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Soft skills: a modern trend or need for future engineers

The paper considers soft skills as an appropriate combination of skills needed for a future engineer to become a successful employee. It presents an overview of the most important soft skills to be trained at the tertiary level. The academic activities and training strategies aimed at the development of soft skills or addressed the soft skills gap among university undergraduates have been listed.

Keywords: soft skills; trends in Higher Education; engineers of the future; academic activities, training strategies.

In fact, the rapid pace of change occurring in our lives is even much faster than one could imagine. The ability of today's engineer to adapt and drive changes has become of paramount importance. When enrolling the university, the undergraduate expects to acquire knowledge, competencies and skills that will allow one to be successful in the future. However, there is a risk to develop skills that will become outdated as shifts happen rather quickly in all spheres of people's life. It is assumed nowadays that the future engineering professions might look like a sequence of majors which needs to be mastered in the process along the way. Pursuing training and being awarded with two or three certificates might not be enough to be ready for tomorrow. Learning has become a non-stop process, therefore, the issue of soft skills development cannot be overestimated.

By definition, soft skills are known to be «skills referring to a cluster of personal qualities, habits, attitudes and social graces that make someone a compatible employee» [5, p. 67]. According to Collins English Dictionary, they are «desirable qualities for certain forms of employment that do not depend on acquired knowledge: they include common sense, the ability to deal with people, and a positive flexible attitude» [2]. Nowadays there is a huge number of investigations and definitions devoted to soft skills studies, they all agree on the idea that they are a combination of communication skills, social skills, character or personality traits, attitudes, emotional intelligence that allow one to perform well within the professional environment and achieve the goals with implementation of hard skills as well.

Researchers at Boston University, University of Michigan's Ross School of Business have found that employees who demonstrate excellent soft skills are 12% more productive than those who experience soft skills gap [3, p. 751]. It might be explained by the fact that it helps them adjust to changes easier, to deal with new information and big data, to communicate with new people and to work in teams. Some of the most essential soft skills required for a future engineer [1] are presented in Table 1:

Table 1

Desired soft skills that should be a part of every learning program

Soft skill	Definition
1. Multilingual and multi-cultural ability	ability to use the English language fluently understanding national and cultural context
2. Ability to handle with project and processes	ability to meet the requirements of the project task and be able to stick to deadlines
3. Ability to work in high uncertainty and rapidly changing tough condition	ability to demonstrate quick decision-making, prompt reaction to changing work conditions, to allocate resources and manage the time
4. Creativity	ability to find unusual and non-standard decisions to solve the problem
5. IT skills	skills which comprise various abilities from hardware installation, software development and work with artificial intelligence to troubleshooting, data analysis and automatic complexes control
6. Teamwork	ability to work together with other learners (to listen and hear team members), to apply the collaborative effort of a group to achieve a common goal and complete a task in the most effective and efficient way
7. Ecologically-friendly thinking	ability to work in a sound way avoiding any destructions to nature, being mindful of the planet
8. System thinking	ability to see a situation in a more complete way, to recognize that all elements are interrelated and to figure out that there may be multiple interventions to a problem

Nowadays, a huge number of universities are trying to introduce and incorporate various subjects / formats / types of tasks that develop the abilities to communicate, to solve problems, to think critically, to collaborate and etc. The main focus of this article is to find and show correlation between the tasks and activities that Tomsk Polytechnic University (TPU) undergraduates (freshmen) are being involved, in compliance with the curriculum, and the set of skills which these activities train (Table 2).

Table 2

Type of activity and the soft skill to be trained

Type of a task	Overview of the task content	Soft skills
Project work	In TPU the activity is named as creative project. The instructor divides all students into small project groups. Every group agrees on topic to be scrutinized and distributes the responsibilities among the team members. The main idea is to learn to work in a team. Nobody remains without responsibility and everybody is engaged and participate in the activity.	Teamwork, research skills, system thinking, creativity
Debates	Debating involves learners to express their opinions from two competing perspectives. The purpose of the task is to express the opinion on the topic and provide an opposite view to each other's argument. Often students are divided into two groups and the topic for discussion is suggested by the instructor.	Communication skills, ability to work in high uncertainty and rapidly changing tough conditions
Foresight	Forecasts can be used to agree on the course of actions to achieve the desired results. The idea behind here is to teach learners to understand that the future depends on their efforts, which means it can be molded. Some things can be predicted, however, generally one cannot foresee it with complete accuracy. And the learners learn that they can either prepare themselves for this.	Strategic planning and forecasting
Hackathon	This is a participatory activity of short duration, where people gather together to find a solution to some particular real life problems (challenges), in a friendly environment.	Teamwork, problem-solving, communication skills
Mind mapping	The main idea of the activity is to connect ideas with the main goal and present it graphically. In other words, this is a visual thinking instrument that allows structuring information, to better analyze it, synthesize, and assess critically.	System thinking, critical thinking

On the one hand, focusing on the development of soft skills and incorporating this component when planning curriculum have really become a trend of contemporary approaches to tertiary education. On the other hand, implementation of tasks which requires active participation of undergraduates, learner's involvement might result in some pitfalls. Students may encounter difficulties such as «lack of confidence, nervousness, shyness, and lack of proper training of public speaking, cultural barriers, non-encouraging environment» [4, p. 1041].

To sum up, the following conclusion can be made from the work done. Nowadays the public technical university, discussed in the paper, is undergoing the changes and shifting its focus on the soft skills development via teamwork activities, project work, debates technology, foresight sessions and many other different tasks which foster communication skills training, strategic planning, critical thinking, problem-solving and learners' socialization. In this regard, soft skills training programs must be embedded in university curriculum as an extra activity or additional training workshops. Additionally, some learners might face problems for their personal reasons: lack of confidence, shyness, nervousness, stress, lack of proper communication skills, cultural barriers. Therefore, this issue must be taken into account by the university authorities, when designing a training course or program.

Литература

1. Atlas of Emerging jobs. 2015. Retrieved from http://www.skolkovo.ru/public/media/documents/research/sedec/SKOLKOVO_SEDeC_Atlas_2.0_Eng.pdf (date of access: 16.10.2020).
2. Collins online dictionary. Retrieved from <https://www.collinsdictionary.com/> (date of access: 11.10.2020).
3. Jungsun K., Mehmet E., Hwayoung J. Training soft skills via e-learning // International Journal of Contemporary Hospitality Management. 2011. Vol. 23(6). Pp. 739–763.
4. Majid Sh., Liming Zh., Tong Sh. Soft Skills for Education and Career Success // International Journal for Cross-Disciplinary Subjects in Education. 2012. Vol. 2 (2). Pp. 1036–1042.
5. Vasanthakumari S. Soft skills and its application in work place // World Journal of Advanced Research and Reviews. 2019. Vol. 3 (2). Pp. 66–72.

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