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## **PREREQUISITES FOR THE FORMATION OF INNOVATIVE SKILLS OF THE FUTURE IN THE CONDITIONS OF INDUSTRIALIZATION 4.0**

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*Given the recent trends related to the features of Industrialization 4.0, there is an objective need to prepare students for the skills of the new times. The relevance of the research topic is related to the fact that these technologies are becoming more widespread and play an increasing role in many industries, and their application requires special knowledge and skills, which can only be obtained through STEAM training. The aim of this paper is to justify the necessity of introducing STEAM skills in modern education.*

***Keywords:** Innovation skills, Future skills, Industrialization 4.0, STEAM, Entrepreneurship.*

***Relevance and necessity of the study.** The rapidly changing business environment triggered by the Fourth Industrial Revolution is forcing entrepreneurs, managers and employees to change. More and more people are realizing that change is inevitable and that it is imminent. A logical question in this context is the approach to acquiring new knowledge and skills, which is of serious concern to educational institutions, in particular universities, which are the engines of progress and promoters of new knowledge.*

*Science and emerging technologies are at the core of Industrialization 4.0. They make it possible to create new products and services, improve production processes, change the way we work and serve our customers, thereby significantly increasing business efficiency [1]. Changes affect all fields of activity and all professions: engineers and mathematicians are the specialists who can apply new technologies to solve complex technical problems, art, including design, plays an important role in creating convenient and attractive products and services that meet market demands. In this context, the latest technologies are already significantly overtaking humans in terms of the speed of processing queries, generating tasks and non-triviality of solutions.*

***The aim of the study** is to justify the need for STEAM skills development in the context of the rapid changes called Industrialization 4.0, and to consider the main directions of development of this approach.*

In particular, our *study relates* more to the need for STEAM skills in the field of Business and Administration at the Academy of Economic Studies in Moldova, where an international project "Developing and improving the STEAM skills of students and teachers for curriculum innovation and sustainable development of higher education institutions and local businesses (Skills4future)" is being implemented since 2023 [2].

So, what is the acronym STEAM and why is it so popular today? The name is derived from the first letters of the fields (Science, Technology, Engineering, Arts, Mathematics) to be developed in modern education, in particular entrepreneurship and management. Thus, innovations in education will concern the *following areas*:

*Decision-making based on data analysis.* Data analysis skills, including the use of statistical tools and software, can help students collect and analyze data to make informed business decisions. They can use these skills to identify market trends, sales forecasting, risk analysis, etc.

*Project Management.* Skills such as planning, organizing, coordinating and controlling can help students to effectively manage projects in different business areas. They can use these skills to manage budgets, resources, timelines and teams.

*Innovation and business development.* Technology entrepreneurship skills, such as idea development, business plan creation, prototyping and innovation implementation, can help students create and develop their own business or implement innovative ideas into an existing business.

*Communication and teamwork* skills are essential in any area of business. Students can use these skills to communicate effectively with their colleagues, customers and partners and to work successfully as part of a team.

*Business Development.* Entrepreneurs and managers who have technology entrepreneurship and business development skills can use them to create new products and services, optimize business processes and improve the company's competitiveness in the marketplace. They can use skills in prototyping, idea development, business planning and innovation to create more efficient and competitive businesses.

*Digital Literacy.* Students who possess digital literacy skills can better understand and use various digital technologies such as social media, mobile applications, cloud services, etc. They can use these skills to create and manage online products and services, social media branding, data analysis, etc. [3].

The listed areas show how future skills will help students, future and current entrepreneurs adapt to the provocations brought about by Industrialization 4.0. The development of critical thinking, the ability to analyze data and use artificial intelligence, big data and the internet of things in their work. The next question we pose in this study is: "How, through which methods and approaches is it possible to teach these skills?"

In order for students to work successfully with new technologies, they must be able to apply knowledge in practical tasks and develop their skills in collaboration with their colleagues. This is facilitated by the introduction of practical assignments and projects into the learning process, which may include prototyping, programming, business model and project development, business cases involving the need to analyze large amounts of information, creating start-ups, developing business plans, challenges, business marathons and much more. Students should also have the

opportunity to work in teams to learn collaborative problem-solving and develop communication skills.

Another *area* in this context is the establishment of cooperation between universities and entrepreneurs. Constructive cooperation implies joint meetings, workshops, presentations, internships, business games, where students will identify problems and possible solutions for existing businesses, as well as develop a vision to create their own start-ups, innovative businesses that should develop the Moldovan economy and entrepreneurial climate. Therefore, the creation of a Centre for Entrepreneurship Development, which will deal with these areas, will be an answer to the question posed.

Another important *aspect* in the direction of skills development specific to Industrialization 4.0 is the development of creativity, including through artificial intelligence, which will help generate and shape new ideas, foster collaborations, and develop new forms of business [4].

Given the *data from a post-doctoral survey* that has so far involved representatives of 152 SMEs in Moldova, only about 18% of them show the willingness of entrepreneurs to work closely with HEIs, and almost half (about 49%) do not consider the lack of such interaction as a serious problem. At the same time, about 32% of the respondents consider the need to adapt to the changes and to digitize their enterprises in a timely manner. From this we can conclude that the entrepreneurial culture is not yet sufficiently developed in the direction of developing close links with HEIs. And therefore, one of the researcher's tasks is to develop this direction.

**In conclusion**, we can say that STEAM skills are becoming increasingly important for higher education in the context of Industrialization 4.0. They will not only help students to successfully start their careers but are also essential for the future development of society. Therefore, higher education institutions should constantly develop and update curricula and teaching methods in order to provide their students with the necessary STEAM knowledge and skills.

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