STEAM SKILLS DEVELOPMENT IN ENTREPRENEURSHIP EDUCATION

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Abstract
The influence of multiple internal and external factors, which have an impact on the activity of higher education institutions in the Republic of Moldova, imposes the need to implement new teaching methods, able to create and develop in students the competences required by the current context. STEAM (Science, Technology, Engineering, Arts, Mathematics) competences contribute to the development of skills related to real-world problem solving, communication, collaboration, creativity and innovation, which are so necessary in an environment oriented towards digitalisation and sustainability. The article presents the results of a survey conducted with the purpose to identify STEAM skills gaps for students, teachers at the Academy of Economic Studies of Moldova and local practitioners, as well as the assessment of local learning needs consisting of digital and non-digital skills, entrepreneurship, creativity, innovation. The study is conducted in the framework of the Erasmus + Skills4future project "Developing and improving STEAM skills of students and teachers for curricular innovation and sustainable development of higher education institutions and local enterprises", No. ERASMUS-EDU-2022-CBHE-STRAND-2 - 101081787. The overall objective of the project is to modernize the curriculum for students of the "Business and Administration" specialization, cycle I bachelor by integrating STEAM skills in several areas: economic, environmental and social.
The study was carried out in 2023 and allowed to draw some conclusions and come up with recommendations for the development and modernisation of entrepreneurship education in the Republic of Moldova.

Key words: *higher education institution, entrepreneurship, entrepreneurship education, STEAM skills, digitalisation.*

JEL Classification: *A20, I23, I25, L26*

I. INTRODUCTION

The economic and social development and prosperity of the Republic of Moldova, as well as of each individual, depends on the quality of the human capital, the skills developed and the ability to adapt to the surrounding changes. Implementing the principles of sustainable development and the requirements of the 4th Industrial Revolution places additional demands on the training of the next generation of specialists. Forecasts indicate that 44% of workers' skills will be disrupted in the next five years, with cognitive skills growing in value the fastest, reflecting the increasing importance of solving complex problems in the workplace (Future of Jobs Report, 2023). Under these circumstances, the primary task of the modern education system is to prepare students for 21st century jobs, where human intelligence is being replaced by artificial intelligence, technologies are pushing the boundaries of reality, work performed by skilled workers is being robotized, and professions are becoming multidimensional (Cazacioc, 2022).

In these turbulent times, the role played by higher education institutions in society becomes of utmost significance (Corteze, 2003), and communities expect higher education institutions to actively engage and take responsibility by transferring their competences to the direct local context to stimulate social innovation and sustainable development (Jordaan & Mennega, 2021). Providing higher education institutions and other stakeholders with the tools to improve the effectiveness of their education programmes for innovation and sustainable development is a necessary step in implementing sustainability globally (Mokski et al., 2003).

Thus, society needs new educational models that strengthen the entrepreneurial capacity, skills and mindsets of students and learners of all backgrounds, ages and cultures, aimed at creating future social innovators and agents of change in Europe (Păunescu, 2015).

Atkinson and Mayo demonstrate that science and technology-based innovation is impossible without an educated workforce in science, technology, engineering and mathematics. There is a strong link between STEM education, wider research and increased innovation, which makes it necessary to invest in strong STEM education (Atkinson & Mayo, 2010). Thus, science, technology, engineering, arts and mathematics (STEAM) education is well suited to meet the challenges of the 21st century.

STEAM is becoming a popular subject in the education world and the business community because it focuses on developing skills related to real-world problem solving, communication, collaboration, creativity and innovation. It is worth mentioning, that originally the STEM concept emerged, which later evolved into STEAM, with the fields of science, technology, engineering and mathematics being complemented by art. But the change was not just about adding a letter to the abbreviation, it involved integrating fine arts and design thinking into all STEM fields (Yakman, 2008).

An important role in the development of entrepreneurship and enterprise is played by entrepreneurship education, which enables young people to be more creative and confident in what they do and increases their chances of employment, encourages them to start new businesses and improve their role in society and the economy (Covaș et al., 2019).

Entrepreneurial education should not be confused with economic studies which is about business, as the aims of entrepreneurial education are more complex: promoting creativity, innovation and independent/collective practical business activities. According to the broad definition of entrepreneurship, it is about personal development, creativity, self-confidence, taking initiative, action orientation, i.e. becoming entrepreneurial (Lackéus, 2015).

It should be noted that research in technology entrepreneurship education has found that education often focuses on single discipline studies, whereas entrepreneurship is inherently interdisciplinary (Papayannakis et al., 2008). Winkler et al. (2015) argue that STEAM programs need to focus on being more cross-disciplinary and place their curriculum in a business/entrepreneurship context to give their graduates a competitive advantage in the labour market. Combining knowledge from STEAM disciplines with leadership, communication and business skills can be very valuable for graduates who are open to varied career paths (Winker et al., 2015). At the same time, key findings point to the fact that STEAM entrepreneurs are more likely to be generalists and participate in a wider range of professional activities (including R&D and non-R&D activities) than salaried STEAM workers (Stenard, 2021).

In this context, policy documents, initiatives and projects have been developed in the Republic of Moldova that will have a direct positive impact on the development of STEAM skills. Thus, in the National Development Strategy "European Moldova 2030", in Objective 3. Ensuring relevant and quality education for all throughout life, it is planned to revise and modernize the curricula in all cycles of education as to prepare pupils and students for the demands and challenges of the information and innovative age of their future jobs.

Training and encouraging students with entrepreneurial skills is one of the specific objectives in the strategic development of the Academy of Economic Studies of Moldova. Stimulating entrepreneurship among young people brings multiple benefits - both economic and social: reducing unemployment, promoting social inclusion, stimulating innovation, increasing self-confidence, moral satisfaction, etc. The new circumstances require the development of different skills from those promoted by universities in the Republic of Moldova so far. There is an urgent need to integrate innovation and STEAM education into university curricula.

For this purpose, a study was conducted, which has the main objective to contribute to the development of entrepreneurship education in the Republic of Moldova by identifying STEAM skills gaps for students, teachers and local practitioners, as well as assessing local learning needs, i.e. digital and non-digital skills, entrepreneurship, creativity, innovation and sustainability skills.

The analysis carried out in this study highlighted the skills needed to match the ecological, social and digital changes that are promoted by the European Skills Agenda (European Skills Agenda, 2019). At the same time, great consideration was given to the Business Skills 4.0: EU initiative on the new curriculum for the 4th industrial revolution (Skills for industry curriculum guidelines 4.0, 2020), which analyzes the changes caused by the 4th Industrial Revolution, the skills that need to be developed in future professionals to determine all the technologies and changes needed to be taken into account in entrepreneurship education.

II. DATA AND METHODOLOGY

The study was conducted between the 3rd of April and the 2nd of May 2023. A questionnaire-based survey method was used to identify existing perceptions and attitudes towards the investigated variables. The survey was conducted online via Google Forms.

A specific questionnaire was distributed among the students to identify the level of development and learning expectations of STEAM skills. The questionnaires were completed by 91 students from the Business and Administration, undergraduate, full-time and part-time study programme, from all years of study.

At the same time, the research was carried out on a sample of 18 teachers, who teach in the Business and Administration undergraduate program at the Academy of Economic Studies of Moldova. In order to assess the entrepreneurial/innovative potential at ASEM and to identify weaknesses, the HEInnovate self-assessment tool for higher education institutions, developed by the European Commission and the OECD, was applied. HEInnovate is an online self-assessment tool for higher education institutions wishing to explore their innovative potential. It serves as a guide through a process of identifying, prioritising and planning actions in eight key areas. HEInnovate also diagnoses strengths and weaknesses, launches discussions and debates on the entrepreneurial/innovative nature of the institution and allows comparison and contrast of developments over time. Each field has a series of statements that the user must rate on a scale of 1 to 5, depending on how much they agree or disagree with the statement about their institution. On the scale, 1 represents the lowest score and 5 the highest score.

The research was also conducted on a sample of 33 local practitioners and employers in the Central region of Moldova. Companies were given a questionnaire, which aimed to highlight attitudes, perceptions and knowledge about the level of STEAM skills development, as well as learning needs and expectations for STEAM skills development, but from the practitioners' point of view.

The responses provided by students, teachers and practitioners allowed to determine existing trends and to identify actions to improve entrepreneurship education in the Republic of Moldova.

III. RESULTS AND FINDINGS

1. Student opinion

In order to determine the students' opinion on the level of STEAM skills development, their digital and non-digital skills were investigated: intellectual, socio-emotional and technical. Thus, the analysis of students' awareness of the use of digital technologies in transforming the way business works is shown in Figure 1.

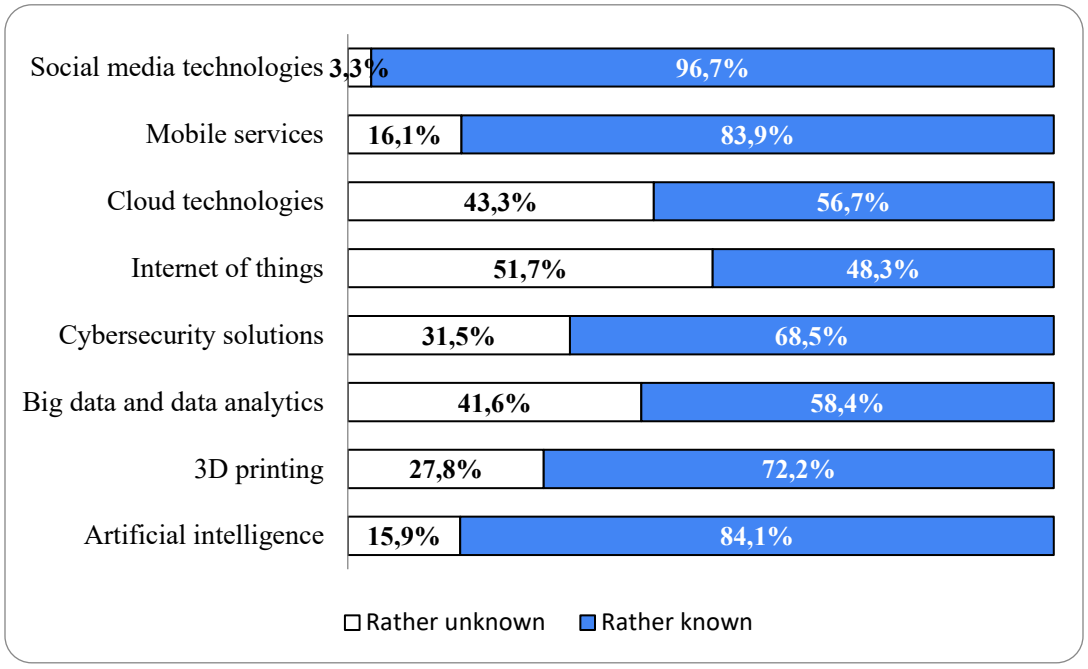

Figure 1. Students' awareness of digital technologies

Analyzing students' awareness of the use of digital technologies applied to business, it is visible that they feel more knowledgeable in Social media technologies - 96.7% of respondents, Artificial intelligence - 84.1%, Mobile services - 83.9%, 3D printing - 72.2%.

At the same time, more than half of the students (51.7%) indicated that they are not very familiar with Internet of Things and Cloud Technologies (43.3%), and Big Data and Data Analytics (41.6%) are also relatively unknown to them. This suggests that there is a need to increase awareness and education of students on the use of these technologies in business and society in general.

The analysis of perceptions of the purposes of investing in digital technologies is shown in Figure 2.

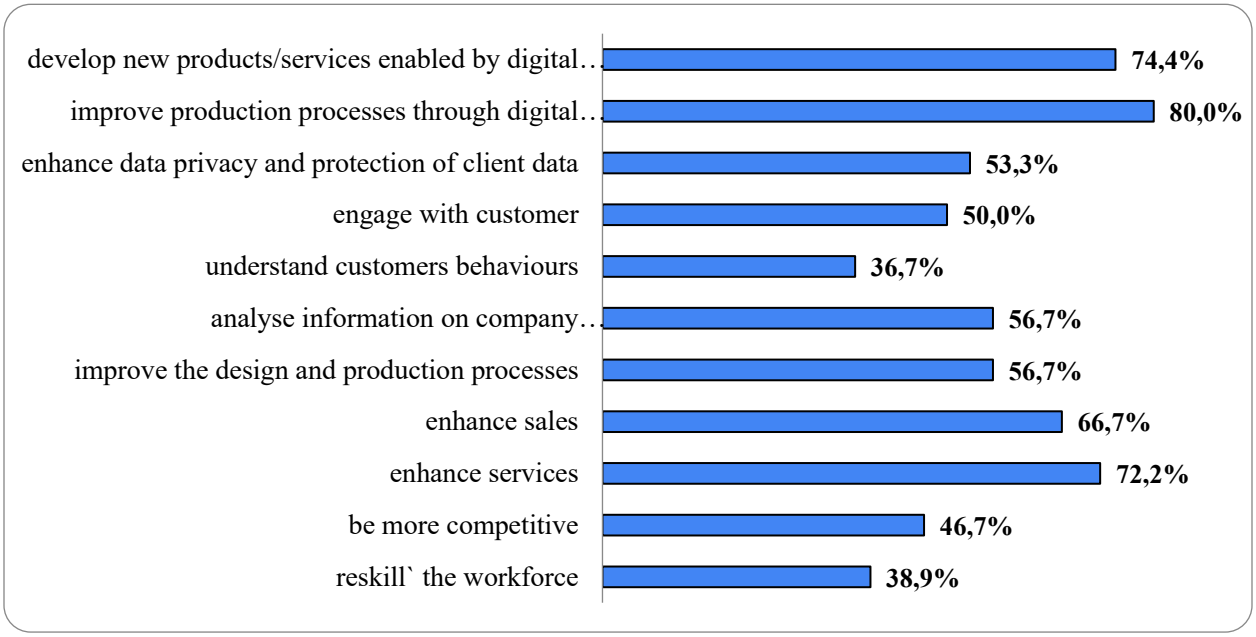

Figure 2. The purposes of investment in digital technologies

According to the students' opinion, the main purpose of investing in digital technologies is to improve production processes through digital technologies, as mentioned by 80.0% of the participants. In second place, with 74.4%, is Development of new products/services made possible by digital technologies. Other important objectives mentioned by respondents were Improving services (72.2%) and Improving sales (66.7%).

In contrast, the reasons considered less important by respondents were Retraining the workforce (38.9%) and Understanding customer behavior (36.7%). This suggests that, for the majority of students, investment in digital technologies is more oriented towards improving production processes and developing new products and services than towards human resources or understanding customer behavior.

In terms of **digital skills** in relation to what is needed for those working in Business 4.0, students, for the most part, consider themselves to have developed or highly developed digital skills.

Thus, the most advanced skills are those related to digital content creation - 72.2% of them rated as developed (26.7%) or highly developed (45.6%) the skills of browsing, searching, filtering data and information and digitising content, and 71.1% those related to combining different creative media (text, images, audio and video) and evaluating and managing data, information and digital content.

The level of digital communication is also perceived as high by students. 72.2% of respondents rated as developed (27.8%) or highly developed (44.4%) the skills to edit information to communicate via email, slide shows, social media posts, blog and 68.9% to share content and information using social media and collaboration platforms (e.g. Google Drive, Dropbox, etc.) to collect feedback.

In addition, students rated their information and data processing skills - 70% of students rate the usefulness, timeliness, accuracy and integrity of digital information as developed or highly developed, and 68.9% rate their ability to distinguish reliable information from unreliable digital sources as developed or highly developed.

In terms of solving digital problems, 62.5% of respondents rated their skills in terms of the latest digital technologies used by others and their potential as developed (36.4%) or highly developed (26.1%), and 63.3% of

students rated their skills in terms of using the potential of technology to represent and solve digital problems as developed (34.4%) or highly developed (28.9%).

It is essential that students continue to improve their digital problem-solving skills as they enter the labour market and become professionals in the digital age.

In terms of students' views on the level of STEAM skills, looking at **non-digital skills** in relation to what is required for those working in Business 4.0, respondents reported having a Developed and Very Developed level of **intellectual skills**, such as Learning to Learn (66.7% and 73.9%), Critical Thinking (65.6% and 70.8%), Creativity (68.5%) and Foreign Language - 62.9% of respondents. As for the competency Complex Information Processing - 7.95% claimed that they are not developed at all and 6.82% are not satisfied with their problem solving skills.

The majority of students also believe that they are flexible and able to adapt to change (**social-emotional skills**). 74.2% said that they are able to revise opinions and courses of action in the face of new evidence, and 64.4% that they are able to adopt new ideas, approaches, tools and actions in response to changing contexts. Similarly, 64.4% believe that they have an intermediate to advanced level of Entrepreneurship, being able to turn ideas into actions that meet the need for achievement.

The students' views on the level of **technical skills** are shown in Figure 3.

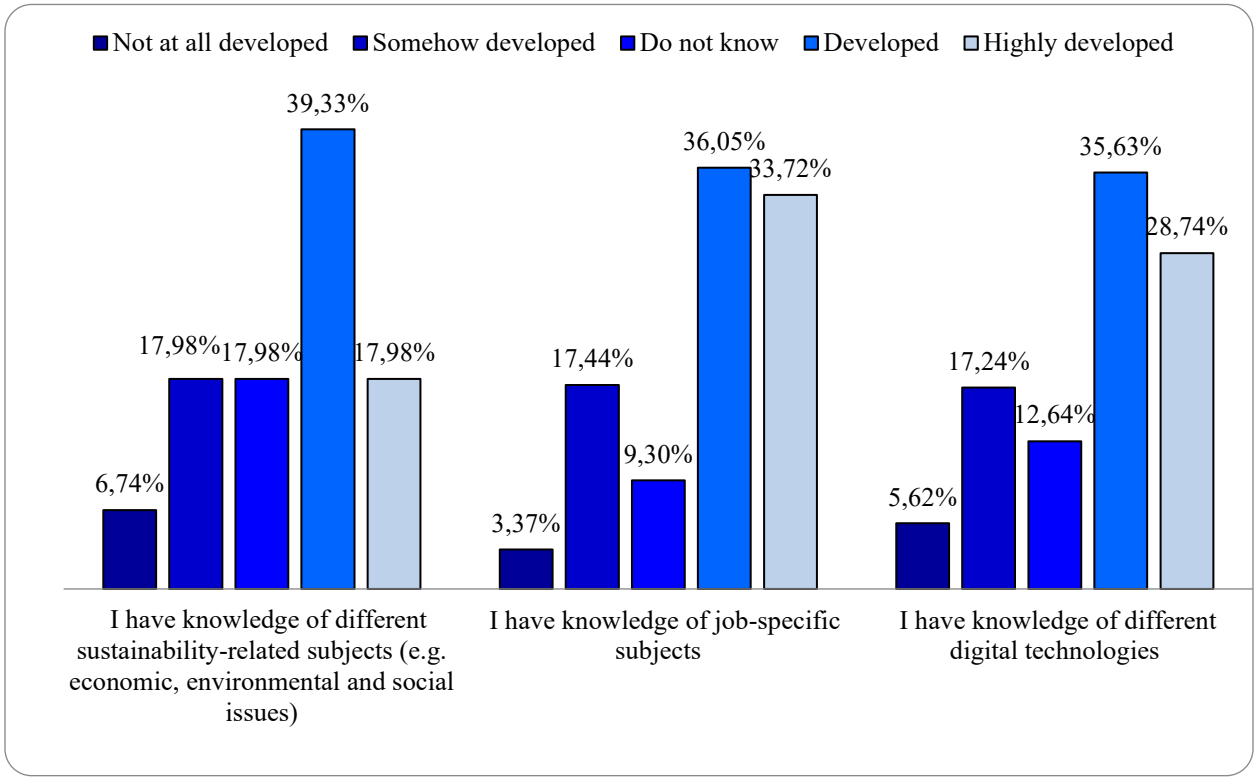

Figure 3. Technical skills as perceived by students

In the case of technical skills, 69.8% of the respondents consider that they have developed and very developed knowledge of job-specific topics, 64.4% of the students interviewed mentioned that they have good and very good knowledge of digital technologies. However, they are less satisfied with their level of knowledge on different sustainability topics (e.g. economic, environmental and social issues), and 6.74% of respondents said they lack such skills.

Thus, based on the answers given by the students we can state, that in the courses studied, it is important to incorporate social media technologies, artificial intelligence, Big data and data analytics and cyber security solutions. As for less popular technologies such as mobile services, cloud technologies and 3D printing, they are less known and used in academia. However, it is important to give equal attention to all digital technologies and provide learning and skills development opportunities for each of them.

2. The opinion of practitioners

The perception of business representatives on the level of **digital skills** held by young graduates in relation to internal needs is shown in Figure 4.

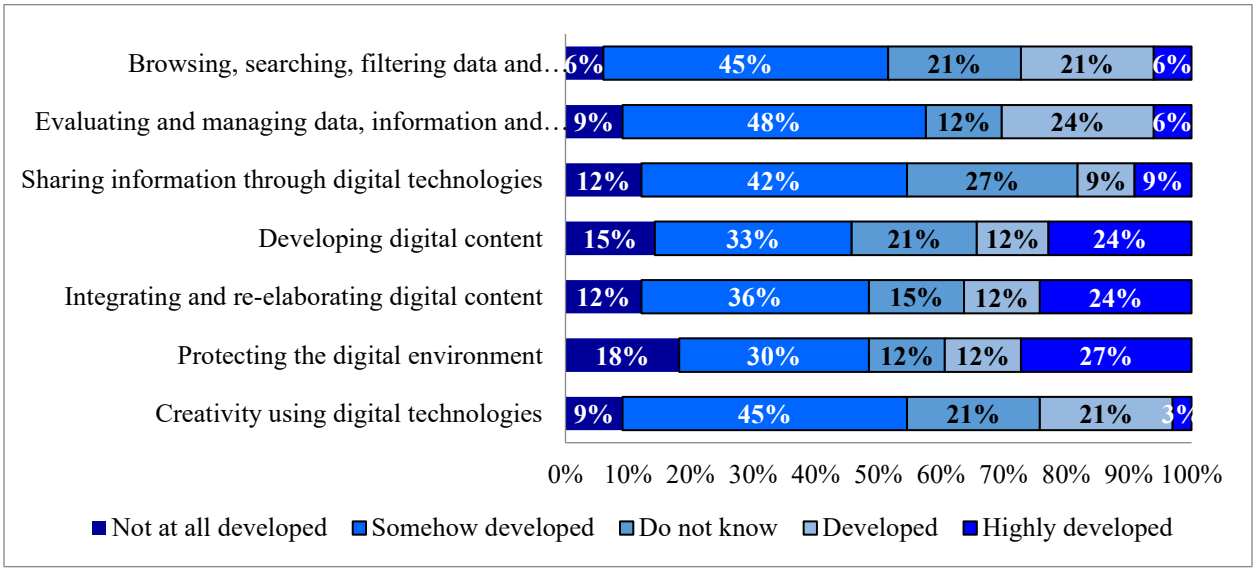

Figure 4. Level of digital skills held by young graduates according to practitioners' opinion

Of the digital skills that young university graduates possess, the least developed are: Protecting the digital environment - 18.2% consider it completely undeveloped and 30.3% consider it sometimes used. Next in descending order is the skill of Developing digital content, which 15.2% of respondents note is completely lacking and 33% consider it partially developed. The following skills are also underdeveloped: Sharing information through digital technologies and Integrating and reworking digital content - 12.1% of respondents say these skills are completely lacking, 42.4% and 36.4% say they are sometimes developed.

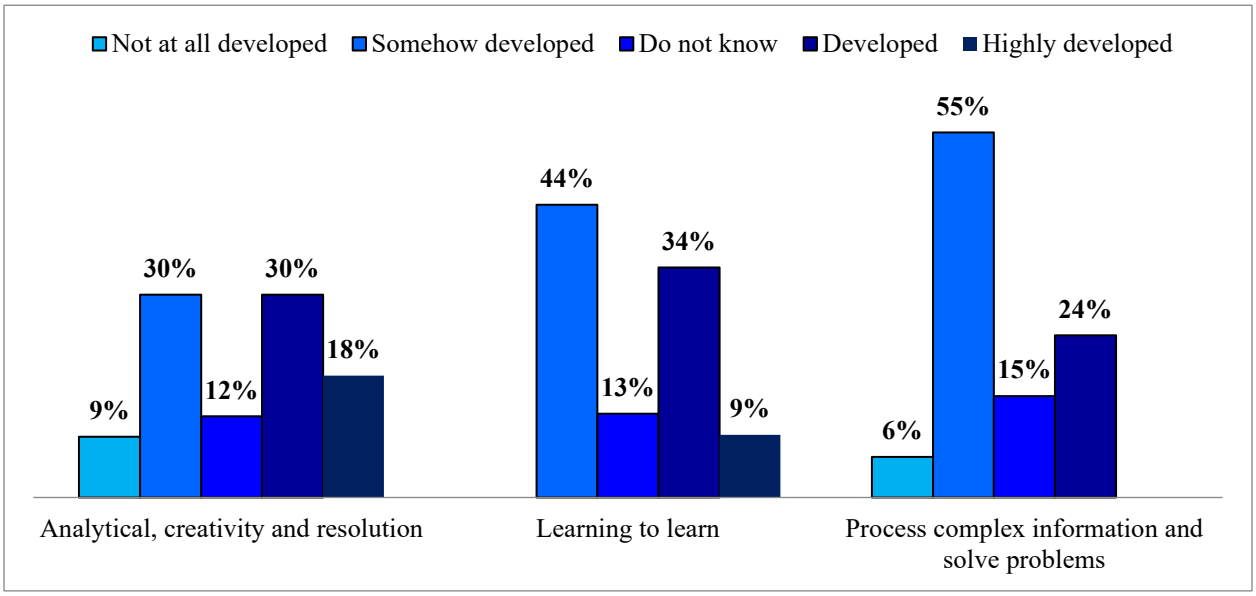

Figure 5. Level of intellectual skills held by young graduates according to practitioners' opinion

The results of the study indicate that in the category of **intellectual skills** (Figure 5) employers rate the least developed complex information and problem solving process. According to this criterion, none of the respondents noted high development of these qualities among young university graduates. At the same time, 24.2%

noted moderate development of this skill. As for the skill "learning to learn", it is also a relatively low indicator - only 9.1% of respondents noted a high level development of this skill among graduates and 33.3% noted moderate development of this skill.

In **socio-emotional skills**, planning and organization are considered the least developed by respondents, the complete absence of this skill is highlighted by 12.1% of respondents.

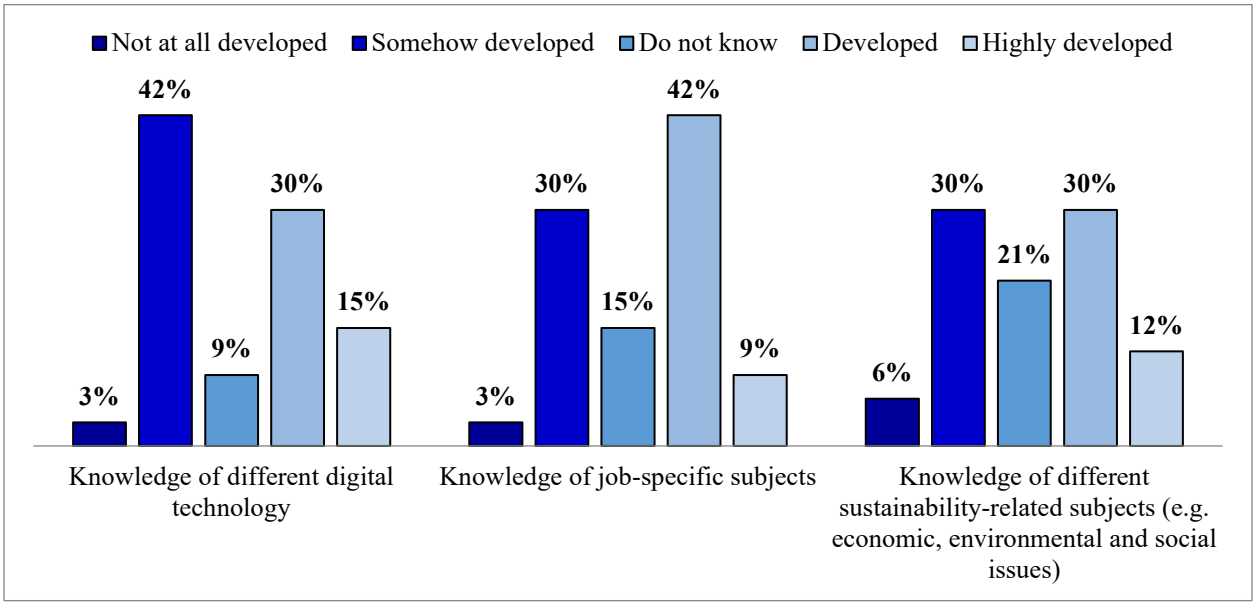

Figure 6. Level of technical skills held by young graduates according to practitioners' opinions

Of the **technical skills** (Figure 6), the least developed, according to the respondents, is the knowledge of various topics related to sustainability (e.g. economic, environmental and social issues) – 6% noted its complete absence, 30% - partial presence.

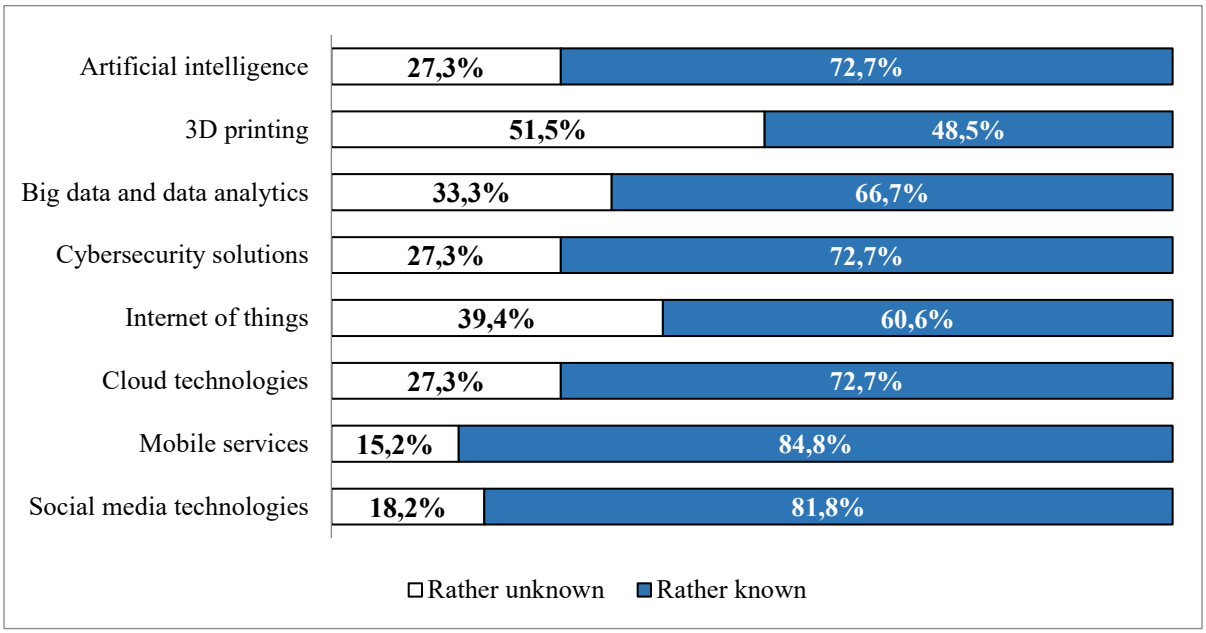

Figure 7. Practitioners' awareness of digital technologies

It was interesting to find out the level of practitioners' knowledge of key digital technologies, which is shown in Figure 7. Respondents' answers highlight the existing interest in Business 4.0 technologies. All the

"somewhat known" responses in this section range from 48.5% to 84.8%. At the same time, 3D printing technology accounts for the fewest "relatively know" responses - 48.3%.

The highest percentage of "relatively know" is occupied by mobile communications technology (84.8%), then social media technologies - 81.8%, which in our opinion makes sense given that many local companies use these tools in their business. 72.7% of respondents noted "relative knowledge" about the following technologies: artificial intelligence, cyber security solutions, cloud technologies. 66.7% of respondents are "relatively aware" of Big Data and data analytics and 60.6% about the Internet of Things.

At the same time, company representatives were asked about company/employer challenges for implementing digital technologies, the answers are shown in Figure 8.

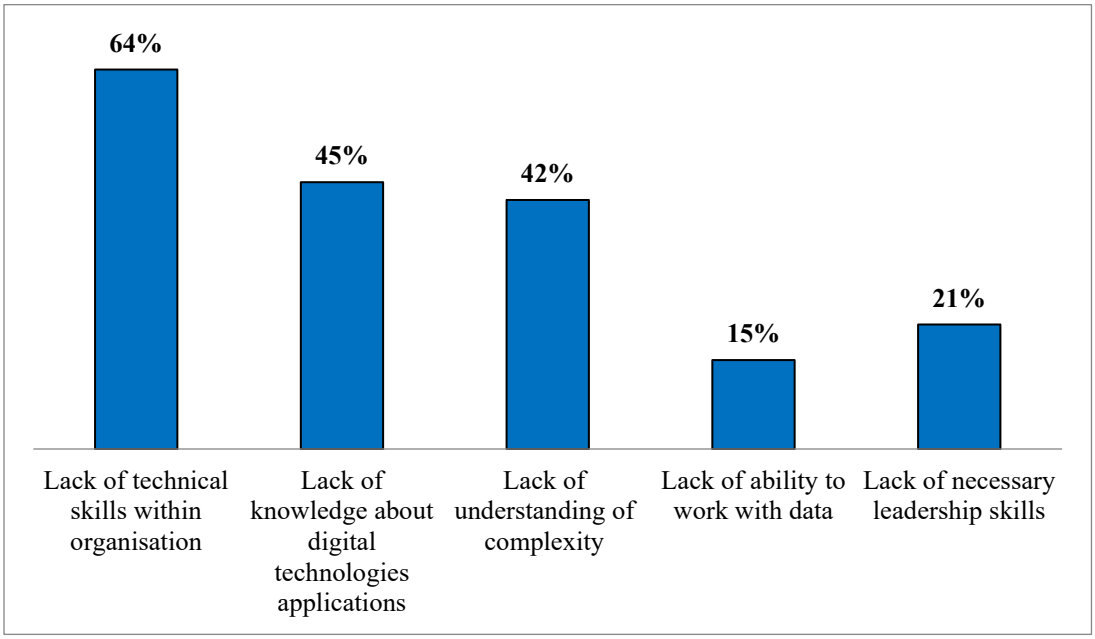

Figure 8. Challenges of using digital technologies according to practitioners

The largest number of respondents (64%) highlight among the biggest challenges - lack of technical skills, which are certainly important when introducing new technologies in any field of activity. The second most important challenge (45%) is the lack of knowledge about the applications of digital technologies. 42% of respondents note the lack of understanding of complexity as an important challenges related to new technologies.

Among the challenges noted by a smaller number of respondents are Lack of necessary leadership skills (21%) and Lack of ability to work with data (15%). So, one can reach a double conclusion regarding this opinion: either business representatives consider these qualities (management and working with data) as unimportant, or the staff of the companies included in the survey have a sufficient level of competence in these areas.

From practitioners' responses on the skills inherent in young people who have recently graduated from university, we conclude that **more emphasis should be placed on the following skills in university programmes**:

- From the category of **intellectual skills**:
  - *complex information processing and problem solving,*
  - *learning to learn*
- From **socio-emotional skills** - *planning and organizing,*
- From **technical skills** - *knowledge of different topics related to sustainability*

Based on student responses, in case studies and exercises, it is important to incorporate social media technologies, artificial intelligence, Big Data and data analytics, and cybersecurity solutions.

As for less popular technologies such as mobile services, cloud technologies, Internet of Things and 3D printing, these are less known and used in academia. However, it is important to give equal attention to all digital technologies and provide learning and skills development opportunities for each of them. This can help prepare students for a successful career in an evolving digital environment.

To meet the challenges of the fourth industrial revolution, university programmes must emphasise the following digital skills:

- Protecting the digital environment
- Developing digital content
- Sharing information through digital technologies
- Integrating and reworking digital content.

At the same time, considerable attention needs to be paid to other digital skills, which, according to respondents, are developed among graduates, but can and should be further developed.

3. Teachers' opinion

Following the application of the HEInnovate self-assessment tool, the respondents, ASEM teachers, rated several statements, organised into 8 domains/dimensions: Leadership and Governance; Organisational Capacity: funding, people and incentives; Entrepreneurial Teaching and Learning; Digital Transformation and Capacity; Training and Supporting Entrepreneurs; Knowledge Exchange and Collaboration; Internationalised Institution; Measuring Impact (shown in Figure 9).

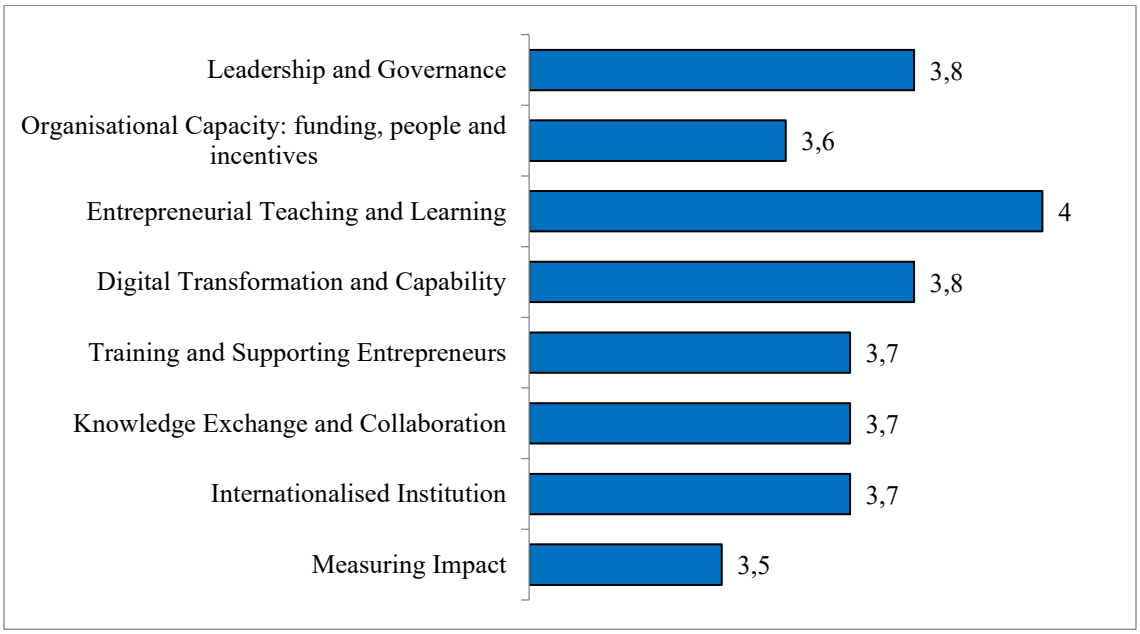

Figure 9. Results of the teachers' questionnaire according to the HEInnovate self-assessment tool

An overview of the HEInnovate dimensions shows that ASEM scored highest in the Entrepreneurial Teaching and Learning dimension - 4; Leadership and Governance - 3.8 and Digital Transformation and Capacity - 3.8.

Respondents gave a lower rating to the following dimensions: Training and Supporting Entrepreneurs - 3.7; Knowledge Sharing and Collaboration - 3.7; Internationalised Institution - 3.7; Organisational Capacity: funding, people and incentives - 3.6 and Measuring Impact - 3.5.

ASEM aims to become a university of research and education, with a strong development of high performance scientific research, with an active presence of entrepreneurial activity, including through the expansion of continuing education programs and support of students' entrepreneurial initiatives, with the eventual expansion of ASEM's Business Incubator and the formation of various Centers for the development of entrepreneurial skills.

In recent years, teaching and learning in ASEM's Business and Management degree programme has increasingly focused on exploring and implementing innovative teaching methods, such as problem-based and project-based learning, start-up idea competitions. Students have the opportunity to learn first-hand about entrepreneurial activity, by interacting and interviewing entrepreneurs, as part of their assessment at the Entrepreneurship course. At the same time, we believe that the institution will benefit if more attention is paid to training teachers in creating a new curriculum related to entrepreneurship. It would also be appropriate to implement various mechanisms for students to be involved in reviewing and providing feedback on the courses they have studied.

Members of the Management and Entrepreneurship Department (ASEM) place a strong emphasis on extracurricular learning opportunities, which have become an important addition to formal entrepreneurship courses. Entrepreneurs are also invited during lectures to share their experience with students, as well as organising various events: round tables, conferences, etc. where students have the opportunity to discuss directly with business representatives.

Company visits are often organized for students, which give them the opportunity to get directly acquainted with the particularities of entrepreneurial activity.

Appreciating the role of entrepreneurship education in business creation and development, ASEM is actively involved in the development of students' entrepreneurial skills, being the first higher education institution in the Republic of Moldova to introduce the Entrepreneurship course in the curriculum (1998) and to open the first Business Incubator University Affairs (September 2005). ASEM SMARTLab was also created, where students have the opportunity to participate in extracurricular activities to develop businesses.

However, the study carried out allows us to conclude that further efforts are needed in order to achieve more considerable results towards the creation of an entrepreneurial university and the development of high-level entrepreneurial education.

IV. CONCLUSIONS

With the digitisation of the economy, the spectrum of knowledge and skills for business and administration specialists will expand. In this context, there will be a need for professional and digital knowledge and skills resulting from the emergence of new software, applications, databases, enterprise-wide information systems, etc. Another recent and important trend is the orientation towards the sustainable economy, which makes it necessary to plan business activities according to established sustainability goals.

Thus, the demand for STEAM skills is growing. These are important both for the individuals, as they reflect on labour market placement and income attainment and for society in general, as they are directly linked to the development of the country, the achievement of the Sustainable Development Goals (SDGs) and the identification of innovative solutions for global problems.

The management of a modern enterprise focuses on human resources, their entrepreneurial capacity, innovation and creativity. In this context, the study carried out allows us to make the following conclusions, which would be useful to be taken into account in the higher education system of the Republic of Moldova:

1. The development of STEAM skills implies a focus on rethinking many university curricula and courses in order to develop creativity, adaptability, curiosity, critical thinking, reasoning and decision-making. STEAM skills development will be fostered through the use of the STEAM educational framework, which includes a set of concepts, terms and activities called the STEAM Body of Knowledge, curriculum templates and learning activities with a focus on diversity issues.

2. One of the key directions in this respect may be the creation of a Management and Entrepreneurship Innovation Centre at departmental level. The mission of the Centre will be to strengthen institutional capacity through STEAM skills development and the transfer of entrepreneurial knowledge and practices to foster innovation and sustainable development. The objectives of the Centre may include: creating strategic links between academia, local businesses, professional associations and civil society; supporting student entrepreneurial initiatives; providing STEAM consultancy and expertise to companies, organisations and other interested institutions, etc.

3. In addition to each university individually, a platform between universities can also be created to promote the exchange of ideas, knowledge, as well as to increase interdisciplinarity of research. The platform will also create an online community that will collect best practices and collaboratively develop STEAM educational policies.

4. Each university should contribute to the creation of an open ecosystem, including the collaboration of all stakeholders: students, professors, entrepreneurs, researchers, governmental and non-governmental organisations aiming at mutual exchange of data, information and innovation.

5. At the level of university and inter-university centres there is a need to initiate competitions, training programmes, presentations, meetings with teachers who meet the requirements for STEAM skills training as well as lifelong learning.

6. Additional topics, tools, methods should be included in the curriculum of subjects that contribute to all STEAM skills. Students and other stakeholders should be offered the possibility to pursue university subjects related to their field of interest.

7. Trainings should be organised for ASEM teachers, providing them with teaching tools and applications in STEAM and invite practitioners to co-participate in entrepreneurship education.

8. Provide institutional funding to staff to stimulate innovation and change.

9. Implement systems to reward teachers beyond the traditional criteria of research, publication and teaching.

In this way, the creation of an environment conducive to the development of knowledge and skills in students necessary to promote entrepreneurship, innovation, sustainable development and sustainable lifestyles will allow us to contribute considerably to the advocacy of these concepts in the business environment and among the population, with a beneficial effect on the economic and social development of the Republic of Moldova.

V. REFERENCES

1. Atkinson, R., Mayo, M. (2010). *Refueling the US innovation economy: Fresh approaches to science, technology, engineering and mathematics (STEM) education*. The Information Technology and Innovation Foundation. https://d1bcsfjk95uj19.cloudfront.net/files/2010-refueling-innovation-economy.pdf, accessed August 8, 2023.
2. Cazacioc, N. (2022). Repere metodologice ale conceptului educațional STEAM. In: *Dialog intercultural polono-moldovenesc*, 11-13 aprilie 2022, Chișinău. Tipografia UST, Vol. V, nr.1, pp. 200-207. ISBN 978-9975-76-398-1.
3. Cortese, A.D. (2003). The critical role of higher education in creating a sustainable future. *Planning for Higher Education*, Vol. 31, pp. 15-22, http://citeseerx.ist.psu.edu/viewdoc/download? doi=10.1.1.739.3611&rep=rep1&type=pdf, accessed August 6, 2023.
4. Covaș, L., Solcan, A., Stihi L. (2019). Sustainability of Entrepreneurial Education in the Republic of Moldova. *Ovidius University Annals*, Volume XIX, Issue 1/2019, pp. 167-177
5. European Skills Agenda for sustainable competitiveness, social fairness and resilience, Industry 4.0 Implications for Higher Education Institutions, (2019), pg. 21, https://universitiesofthefuture.eu/wp-content/uploads/2019/02/State-of-Maturity_Report.pdf, accessed August 22, 2023.
6. Jordaan, M., Mennega, N. (2021). Community partners' experiences of higher education service learning in a community engagement module. *Journal of Applied Research in Higher Education*, 107, 2411–2502. https://doi.org/10.1108/JARHE-09-2020-0327, accessed May 24, 2023.
7. Lackéus, M., (2015). *Entrepreneurship in education: What, why, when, how.* OECD. https://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf, accessed August 6, 2023.
8. Mokski, E., Leal Filho, W., Sehnem, S. , Andrade Guerra, J.B.S.O.d. (2023). Education for sustainable development in higher education institutions: an approach for effective interdisciplinarity, *International Journal of Sustainability in Higher Education*, Vol. 24, No. 1, pp. 96-117. https://doi.org/10.1108/IJSHE-07-2021-0306, accessed August 10, 2023.
9. Papayannakis, L., Kastelli, I., Damigos, D., & Mavrotas, G. (2008). Fostering entrepreneurship education in engineering curricula in Greece. Experience and challenges for a Technical University. *European Journal of Engineering Education*, 33(2), 199–210. https://doi.org/10.1080/03043790801980086, accessed August 10, 2023.
10. Păunescu, C., Lepik, K., Spencer, N. (2022). *Social Innovation in Higher Education*, Springer Cham, https://link.springer.com/book/10.1007/978-3-030-84044-0, accessed August 4, 2023.
11. *Site for Higher Education Institutions,* OECD and the European Commission, https://heinnovate.eu/en, accessed March 22, 2023.
12. Skills For Industry Curriculum Guidelines 4.0. Future-proof education and training for manufacturing in Europe: final report. (2020). https://op.europa.eu/en/publication-detail/-/publication/845051d4-4ed8-11ea-aece-01aa75ed71a1, accessed March 12, 2023.
13. Stenard, B. S. (2021) Interdisciplinary Skills for STEAM Entrepreneurship Education. *Entrepreneurship Education and Pedagogy.* Volume 6, Issue 1, https://doi.org/10.1177/25151274211029204, accessed May 24, 2023.
14. Strategia Națională de Dezvoltare „Moldova Europeană 2030", (2020), https://cancelaria.gov.md/sites/default/files/strategia_nationale_de_dezvoltare_moldova_2030-t.pdf, accessed March 10, 2023
15. Winkler, C., Troudt, E.E., Schweikert, C., & Schulman, S.A. (2015). Infusing business and entrepreneurship education into a computer science curriculum-A case study of the STEM virtual enterprise. *Journal of Business and Entrepreneurship*, 27(1), 1-21. https://www2.stetson.edu/asbe/wp-content/uploads/2017/07/JBE-Fall-2015-Digital.pdf, August 24, 2023
16. World Economic Forum. Future of Jobs Report 2023. INSIGHT REPORT. (2023). https://www.weforum.org/reports/the-future-of-jobs-report-2023/, accessed August 24, 2023
17. Yakman, G. (2008). STEAM education: An overview of creating a model of integrative education. https://www.researchgate.net/publication/327351326_STEAM_Education_an_overview_of_creating_a_model_of_integrative_education accessed August 20, 2023