

## ENTREPRENEURSHIP AND DIGITALIZATION: THE CASE OF LITHUANIAN PROFESSIONAL HIGHER EDUCATION

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### Abstract

An entrepreneurial and innovative higher education institution is considered as a response to the social and economic needs of society. Leadership and governance, organizational capacity – funding, people and incentives, teaching and learning methods, local and international collaboration, and many other aspects play an important role in fostering both digital and entrepreneurial progress in professional higher education. Contemporary higher education graduates are expected to possess soft skills including analytical thinking and innovation, active learning and learning strategies, creativity, originality and initiative, complex problem-solving, critical thinking and analysis as well as technology use, monitoring, and control. They are expected to be risk-taking, flexible, and hyper-adaptable to unprecedented circumstances. Higher education institutions must rethink their strategic priorities and change at a rapid pace. Therefore, the research was designed with the aim to enhance the understanding of the concepts of **entrepreneurial higher education institutions** and to address the question of how digital transformation in higher education might enhance the teaching and learning process and to better serve an entrepreneurial culture creation. This study examines an entrepreneurship-driven study environment, activities carried out to boost entrepreneurial spirit, and promotion of digital mentality as a success key to digital transformation. The framework of the research is based on the analysis of literature and qualitative research methods. An open-ended survey questionnaire with 7 Vice-Rectors for Studies of public Universities of Applied Sciences in Lithuania was conducted. The results revealed that although professional higher education institutions are similar in nature, they are different in scope and operate in rather different contexts. Transformations are taking place in different ways and with different means and universities clearly state how they can strengthen their role in society. On the other hand, a lack of systematic is outlined as a barrier to transforming faster.

**Keywords:** Entrepreneurship, Entrepreneurial University, Digitalization.

### Introduction

In recent years expectations for universities have changed dramatically-the entrepreneurial university has become a concept of growing interest in Higher

Education Institutions (hereinafter-HEI) in Europe. To address the needs of their own environment, contribute to regional and national economic development, HEIs have to rethink their missions (studies and research) and strategies and to act more entrepreneurially

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(Mian, 2011; Khalid et. al., 2018; Guenther & Wagner, 2008; O'Connor, 2014; Gibb, 2012). Nowadays, the mission of the HEI is to bridge university and business together in such a way that university benefits from business in activities, categorized into the areas of education (curriculum co-design and co-delivery, student placements, case studies, etc.), research (joint R&D, short-term mobility of academics to business, etc.), volarization (commercialization of R&D results, spin-offs, start-ups, etc.), and management (governance (businesspeople participation in university board), shared resources, endowments, scholarships, etc.), i.e. becomes more entrepreneurial, while the business sector profits from having access to talented professors and students within the university that have the knowledge, skills, and competencies they may be looking for (Etzkowitz, 2008, 2012; Thune, 2007; Plewa et al., 2013; Arvanitis, Kubli, & Woerter, 2008). This study aims to review the development of entrepreneurship and digitalization in universities of applied sciences in Lithuania.

### The Entrepreneurial University

The concept of the entrepreneurial university was developed by Clark (1998) and characterized not only by the willingness to take risks and to experiment with new things but by the ability to learn collectively from experience, create entrepreneurial culture led by strong management and leadership.

As emphasized by numerous authors (Etzkowitz, 2004; Guerrero & Urbano, 2012; Salamzadeh, Salamzadeh, & Daraei, 2011) the model of entrepreneurial university is a complex phenomenon, which embraces policymaking, academic and entrepreneurial activities of community members, research, and sub-organizational cultures. In this regard, the concept of the entrepreneurial university has been investigated from multiple perspectives in different countries (O'shea et al., 2005; Kirby, 2006; Fernández-Nogueira et al., 2018). Although the concept of the entrepreneurial university differs from author

to author, there are some common features that unite all the entrepreneurial university definitions. These are the ability to innovate, initiate, create opportunities, take risks, work in teams, and encounter real-world challenges (Pires da Cruz, Fereira, & Kraus, 2021; Etzkowitz, 2004, 2012; O'Shea et al., 2005; Kirby, 2006).

In order to implement the entrepreneurial mindset across the HEIs, one of the main theoretical models of the entrepreneurial university should be considered. The model by Guerrero, Kirby, and Urbano (2006) (Figure 1) categorizes *formal* and *informal* elements of the entrepreneurial university. The *formal* elements include:

- *The organizational structure and governance of the university.* A dynamic university requires strong entrepreneurial guidance-the commitment of the leadership (different stakeholders: government, industry, academics, business, and students) of the university is essential. Organizational change strategies that engage entrepreneurship are critical to university success in the contemporary world (Staniškis, 2016). An entrepreneurial university is oriented toward quality, flexibility, and entrepreneurial culture (Clark, 1998).

- *Supported measures to create new business.* University applying different instruments and mechanisms can propose students a broad range of support (research facilities, liaisons spaces, incubators, intangible asset, etc.) to think outside the box, dream big, create world-changing innovations, and launch a business (Zaharia, 2002; Etzkowitz, 2004; Keast, 1995).

- *Entrepreneurship education.* Entrepreneurial education has been booming at HEIs around the world. To transform the university into an entrepreneurial one, entrepreneurship has to become a part of any study field: agriculture, education, engineering, psychology, etc. In this perception, a university graduate must possess the following skills: analytical thinking, active learning and learning strategies, creativity, multi-disciplinarily, complex

problem-solving, critical thinking and analysis as well as technology use, monitoring, and control (Van Vught, 1999; Lewis & Moultrie, 2005).

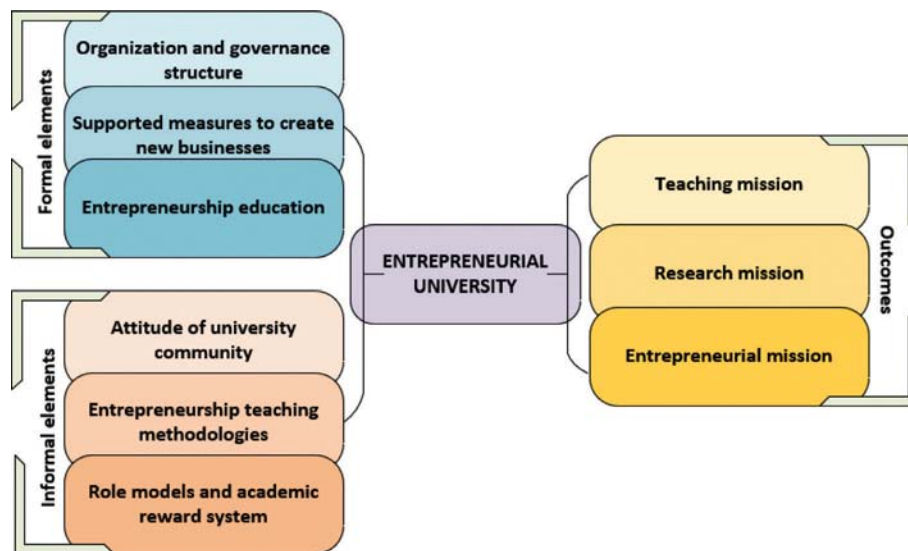
The informal elements comprise:

- *The attitude of the university community.*

Ajzen (2006) defines attitude as the extent to which an individual has a positive or negative evaluation of the behavior in the topic. The positive attitude towards entrepreneurship and the entrepreneurial university is shaped through formal and informal education and public policy (OECD, 2009).

- *Entrepreneurship teaching methodologies.* Entrepreneurship is an applied discipline that requires cases, simulation games, problem-based teaching, and learning, design-based learning, reflective practices, etc. It requires observing the world, creating opportunities, taking risks, i.e. act (Brockbank & McGill, 2007; Carrier, 2007).

- *Role models and academic reward system.* Role models are often considered as a way to motivate individuals to act differently and provide much-needed motivation to set ambitious goals (Bosma et al., 2012).



**Figure 1** Guerrero-Cano, Kirby and Urbano 2006 Model

Source: Guerrero, Kirby, and Urbano (2006, p. 10)

Concerning the previous studies (Etzkowitz, 2004; Clark, 1998; Kirby, 2006), model of Guerrero, Kirby, and Urbano (2006) emphasizes the presence of a contextual environment in which entrepreneurship is developed. While some scholars (Zhu & Bargiela-Chiappini, 2013; Lewis & Moultrie, 2005) conceptualize the environment as a place, where the individual is or where the process takes place, Soliman (2005) argues that the environment refers to the relationship between the individuals and their environments. The environment, although affected by macro or microeconomic

conditions, should train professionals who can develop non-standard ideas, generate spin-offs from innovative projects or create start-ups. The entrepreneurial university besides the traditional *teaching* and *research* missions should incorporate entrepreneurial mission—launch new ventures or generate income from other entrepreneurial activities (Guerrero, Kirby, & Urbano, 2006; Markman et al., 2005).

### Digital Entrepreneurial University

In the past few years, digital technology (social media, business analytics, the Internet of Things, big data, 3D printing, cloud, and

cyber-solutions, etc.) has dramatically revolutionized almost every aspect of our lives including the teaching and learning process. Digitalization for entrepreneurship addressed. Digitalization is defined as the use of technology to renew, simplify, improve processes, tasks, and products (Fitzgerald et al., 2014). Digitalization of higher education covers both, formal and informal elements of the entrepreneurial university. It facilitates administrative solutions, library services, international collaboration, access to diverse teaching and learning resources, etc. (Urbach, & Röglinger, 2018).

As noted by Rippa and Secundo (2018), digital academic entrepreneurship, or in other words entrepreneurial university consists of the following elements (Figure 2):

- The motivation for the application of digital technologies for academic entrepreneurship (*why*). Research shows that academics' positive attitude toward technology is the key aspect in determining whether or not the academic society develops digital competence and digital technology is integrated into the teaching process (Ertmer et al., 2012; Jääskelä et al., 2017; Fernet et al., 2008).

- The stakeholders' engagement and active interaction through the digital technologies to effectively and ambitiously

seek the development of entrepreneurial university (*who*). Application of a collaborative approach-connecting partners across sectors and industries, academics and the knowledge they generate, students and tertiary institutions, alumni, etc. through digital technologies, shape the entrepreneurial university (Mallett, 2019; Cao & Zhou, 2018).

- The processes at the entrepreneurial universities supported by digital technologies (*how*). A process model developed by Wood (2011) identifies the activities, individuals, and main success factors linked to each stage of the entrepreneurial university process. The stages of innovation disclosure and intellectual property protection, awareness and securing industry partnerships, commercialization mechanism selection, and commercialization lead academics and practitioners to financial, reputational, and societal benefits.

- The various forms of digital academic entrepreneurship (*what*). Entrepreneurial university unites different stakeholders for the development of digital spin-offs and start-ups, the application of holistic perspective about entrepreneurship, the acquisition of entrepreneurial competence supported by digital platforms, and other entrepreneurial activities (Rippa & Secundo, 2018).

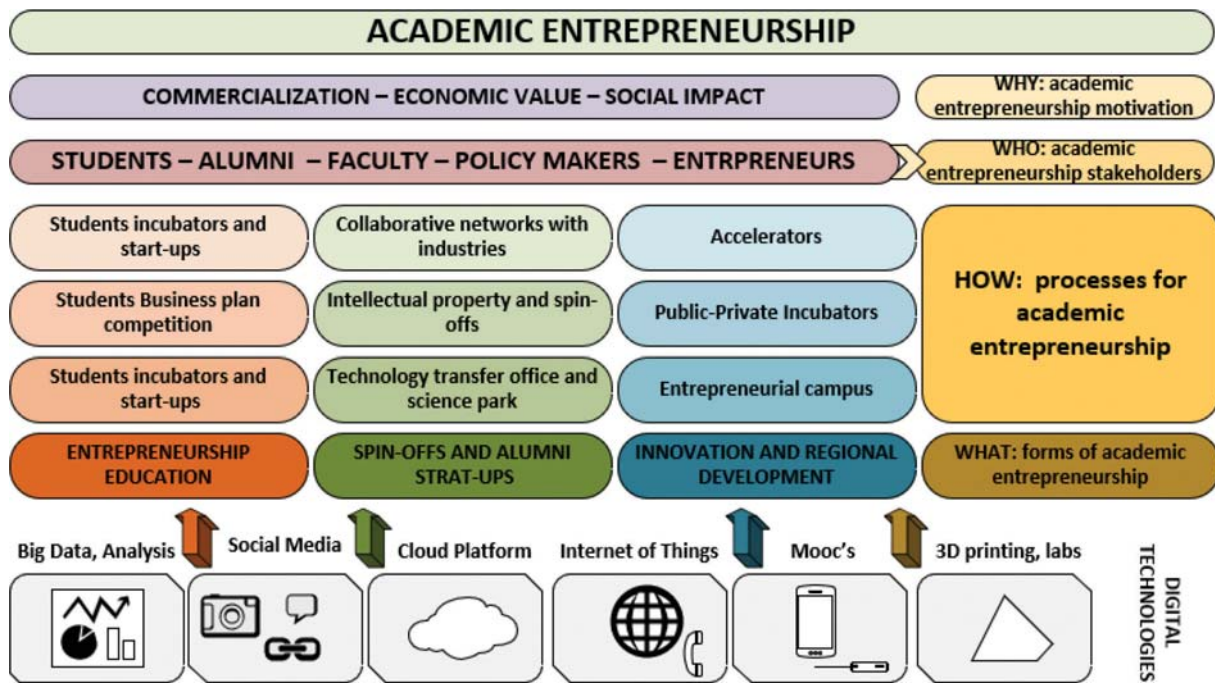


Figure 2 The Impact of Digital Technologies on Academic Entrepreneurship

Source: Rippa and Secundo (2018)

Digital technology accelerates HEIs to change organizational culture, socialize, think, act, consume, and create differently.

Although a lot of research has been carried out on digital entrepreneurial universities in Europe (Lombardi et al., 2019; Secundo, Rippa, & Meoli, 2020; Henderson, Selwyn, & Aston, 2015), there is still a clear lack of studies correlating higher education, entrepreneurship, and digital evolution in Lithuania. The main objective of this study is to focus on a selection of best practices at Lithuanian professional higher education institutions with the regard to entrepreneurial university model (Guerrero & Urbano, 2012) and elements of the entrepreneurial university (Rippa & Secundo, 2018).

### Professional Higher Education in Lithuania

Since 2000, the Lithuanian higher education system is binary. The sector of professional higher education was established by merging a number of former so advanced schools which were operating on a higher level than professional schools but did not award bachelor's degree. To enter the higher

education system, these educational institutions had to prove that they had made significant changes in their curricula, staff, and infrastructure. The ones that successfully overcame the challenges of merging different cultures, human and material resources, and came up with ambitious visions and missions, we're entitled to provide higher education studies and award professional bachelor's degrees.

The Law on Higher Education and Research of the Republic of Lithuania distinguishes the university of applied sciences as the one that provides higher education based on professional practice and applied research, experimental development, and/or professional art, and enables individuals to pursue lifelong learning.

A distinctive feature of Lithuanian professional higher education (hereinafter–PHE) is its orientation to the acquisition of practical knowledge and skills relevant to the contemporary labor market. At present, there are 12 public and 9 private professional higher education institutions in Lithuania. Two of them are comparatively large in

numbers of students, academic staff, and study programs (around 6500 students, 500 staff, up to 50 study programs), the others are significantly smaller. By their practice-oriented character, Lithuanian PHEs (originally called Kolegija) have much in common with the European professional higher education institutions (except for Master and Doctoral studies that LT PHIs do not provide), and during the twenty years have established strong collaboration ties with them. Therefore, they introduce themselves in the international arena as Universities of Applied Sciences (hereinafter–UAS).

During the twenty years, Lithuanian PHE institutions worked out sound strategies, implemented new forms of teaching and learning, directed their research towards the needs of the world of work, and transitioned to successful players in the development of regions and society.

### **HEInnovate, as a Tool for Self-Assessment of Institutional Entrepreneurship and Digitalization**

The European Commission together with OECD has launched an initiative called HEInnovate, to provide higher education institutions with a self-assessment tool for them to analyze their innovative potential and entrepreneurial capacity in eight key areas: Leadership and Governance, Organizational Capacity: Funding, People and Incentives, Entrepreneurial Teaching and Learning, Preparing and Supporting Entrepreneurs, Digital Transformation and Capability, Knowledge Exchange and Collaboration, the Internationalized Institution, and Measuring Impact. A very important component of the methodology is the survey where HEIs are asked to disclose the situation in their own institution according to the dimensions mentioned above. The results of the survey enable HEIs to clearly see their strengths and weaknesses and accordingly project their activities to achieve the efficiency of performance. Moreover, step by step the HEInnovate experts have been working on

the situation in each country of the European Higher Education Area by interviewing representatives of HEI's and research institutions, policymakers, and other stakeholders and producing a series of comprehensive country reviews on supporting entrepreneurship and innovation in higher education. The report on Lithuania states that "higher education institutions (HEIs) and research institutions (RIs) have significantly increased their engagement with the innovation and entrepreneurship agenda in the past decade". Moreover, "Lithuania has seen a dramatic improvement in entrepreneurial teaching and learning over the past decade, "<...> demonstrated real strength in collaboration with public partners, including regional governments">. Nevertheless, the OECD experts recommend Lithuanian higher education institutions "to make efforts to link their entrepreneurial teaching and learning to research activities in the field", "<...> encourage the practice of international influence <...>", "take steps to ensure that entrepreneurial teaching is addressed and tailored to all HE students <...>", "advocate for entrepreneurship teaching at the national level" (OECD, 2021).

The OECD report "Supporting Entrepreneurship and Innovation in Higher Education in Lithuania" reviewed the Lithuanian higher education system from the point of view of entrepreneurship and innovation in general, without distinguishing between academic/ research universities and universities of applied sciences. As the authors of this paper had a possibility to participate in the interviews mentioned above with the European experts, they generated an idea for further in-depth study of entrepreneurship teaching and learning and digitalization in the PHE sector in Lithuania profiting from the research methodology used by OECD experts. This paper is the first step to reaching a full picture of entrepreneurial and digital education in the universities of applied sciences in Lithuania.

## Research Methodology

This study presents a month-long review on the UAS's entrepreneurship, innovation, and digitalization in November 2021, just after the OECD report "Supporting Entrepreneurship and Innovation in Higher Education in Lithuania" was issued and presented to the academic communities of higher education institutions.

An open-ended survey questionnaire, as a qualitative research method, was chosen. The survey was conducted online since in November 2021 Lithuania was in a COVID-19 high-risk zone and face-to-face meetings were not favorable. According to Omilion-Hodges (2017), open-ended questions are questions that do not provide participants with a predetermined set of answer choices, instead of allowing the participants to provide responses in their own words. Open-ended questions are often used in qualitative research methods and exploratory studies. Qualitative studies that utilize open-ended questions allow researchers to take a holistic and comprehensive look at the issues being studied because open-ended responses permit respondents to provide

more options and opinions, giving the data more diversity than would be possible with a closed-question or forced-choice survey measure". Open-ended questions, as an integral part of qualitative research, allowed the informants to allocate adequate time for the provision of considered answers supplemented by exhaustive examples of best practice.

Vice-Rectors for Studies of all 12 Lithuanian public UAS were invited for the survey, as they are the key institutional administrators responsible for the development of studies in the long perspective and operationally. 7 Vice-Rectors for Studies responded.

An open-ended questionnaire was prepared. The research instrument consists of 22 open-ended questions allowing the informant to revise the activities in his/her HEI and collect information carefully and with no hurry.

In reference to the theoretical model by Guerrero, Kirby, and Urbano (2006) (Figure 1) which categorizes *formal* and *informal* elements of the entrepreneurial university, the informants were given the following questions (Table 1).

**Table 1** Open-Ended Survey Questions According to Guerrero, Kirby, and Urbano (2006) theoretical model

Name of the element	Questions
<b>The formal elements of the entrepreneurial university</b>	
1. Leadership, organizational structure	1.1 How does the PHI strategy emphasize the development of entrepreneurial competencies? 1.2 How does the PHI strategy emphasize the development of digitalization? 1.3 What support is provided to PHI academic staff to develop students' entrepreneurial skills? 1.4 What assistance is provided to PHI academic and administrative staff seeking to use/using digital resources?
2. Research facilities, liaisons spaces, incubators, intangible assets, etc.	2.1 What opportunities are created in the PHI for the development of an entrepreneurial mindset and skills? 2.2 Does the PHI have a center/incubator/science workshop for entrepreneurial education? What activities are carried out? 2.3 How does the PHI use social partners' material resources in teaching and/or research activities? 2.4 What computer/digital business simulation programs (games) are used in the study process?
3. Entrepreneurship education	3.1 What examples of good practice in entrepreneurship education do you have in your PHI? 3.2 Is entrepreneurship education integrated into your PHI curricula? What study programs provide students with entrepreneurial knowledge and skills? 3.3 How are entrepreneurship learning outcomes assessed in your PHI? 3.4 Does your PHI conduct entrepreneurship research? How are entrepreneurship research results integrated into entrepreneurship education? 3.5 How does your PHI involve external stakeholders in the development/improvement of study programs?
<b>The informal elements of the entrepreneurial university</b>	
4. The attitude of the PHI community towards entrepreneurship	4.1 How are your PHI academic staff, students, graduates encouraged to start their own business? 4.2 What support is provided by the PHI for the academic staff, students, graduates? 4.3 How are the services of PHI researchers, teachers, students commercialized?
5. Entrepreneurship teaching methodologies	5.1 How are entrepreneurial knowledge and skills provided informally? 5.2 Who is given this knowledge and skills? 5.3 What is the dynamics of the number of students provided with entrepreneurial knowledge and skills? 5.4 What is the development of the informal provision of entrepreneurial knowledge and skills in your PHI?
6. Role models and academic reward system	6.1 How do Lithuanian and foreign business representatives who have established businesses share the best experiences in your institution? 6.2 How is the academic community of your PHI encouraged to become involved in entrepreneurship education activities?

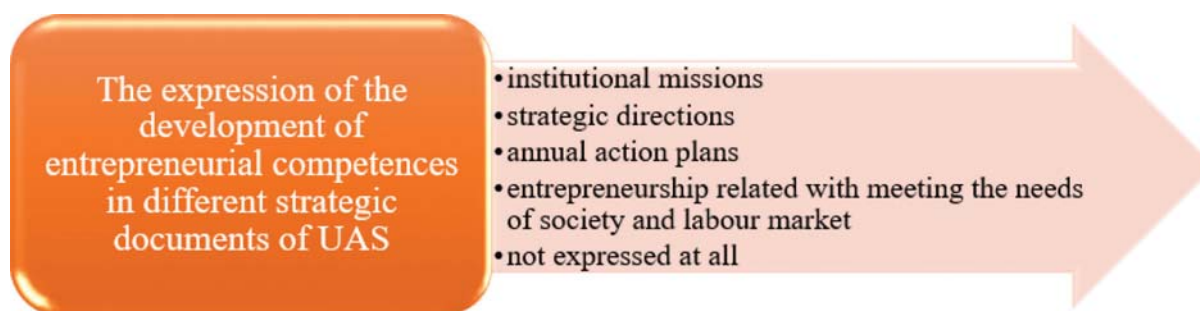


## Discussion and Results

Data analysis started with the coding of the informants. Data received was grouped into 18 categories and 86 subcategories and carefully interpreted.

**The relevance of the development of entrepreneurial competencies** in different strategic documents of Lithuanian Universities of Applied Sciences (thereinafter–UAS) are expressed in various ways: **embedded in the institutional mission:** “The mission of our university is to develop a creative and entrepreneurial personality” (IS2); **strategic directions:** “The fourth strategic direction is entrepreneurship” (IS3); **annual action plans:** “The administrative and academic departments of the UAS annually include specific measures for the development of entrepreneurial competencies in the activity plans” (IL5); “One of the indicators for the improvement of the study programs of the field taking into account the

*needs of the society and (or) labor market is the development of entrepreneurship <...>” (IL7); not expressed at all:* “does not emphasize the development of entrepreneurial competencies”(IS6). It should be noted that some UAS **relate entrepreneurship with meeting the needs of the society and labor market**, without using the word “entrepreneurship”: “The goal <...> is to provide high-quality and competitive studies that meet the expectations of students and the modern needs of society and the labor market” (IS4); “Our university conducts practical and innovation-based higher education studies, developing a civic, socially responsible, learning, creative and entrepreneurial personality” (IL5); “One of the objectives of our university is to ensure the development of lifelong learning and needs of learners not only in terms of professional but also in terms of social competences” (IS1).



**Figure 3** Category “The Expression of the Development of Entrepreneurial Competencies in Different Strategic Documents of UAS” and Subcategories

HEIs provide support to academic staff to develop students’ entrepreneurial skills. Universities **identify teachers’ needs:** “Each year, during the assessment interview, teachers express their need for competence development and a plan is drawn up and implemented” (IS1); “The Human Resources Department annually analyzes the need to improve the competencies of employees by conducting employee surveys and organizing professional development events according to the identified learning needs” (IL5). All UAS pay great

attention to the development of staff competencies. The usual forms of support for the staff are **competence development events organized in the university:** “We provide opportunities for teachers who develop students’ entrepreneurial skills to improve their qualifications at events relevant to entrepreneurship” (IS3); “Teachers have the opportunity to participate in seminars and courses on student entrepreneurship education” (IS4); “Various training, seminars <...> are offered” (IS6); “Conditions are created for

*raising the qualification of teachers in courses, seminars, and training” (IL7); **academic staff internships in business companies:** “Teachers are encouraged to take part in internships in businesses. During the internship, real-world experience of the business environment is gained”, “visits to Lithuanian and foreign business companies” (IL7); **international projects:** “The Erasmus + international project “Development of Social Entrepreneurship Skills in Higher Education” is underway. The project aims to develop teachers’ competencies in the field of social entrepreneurship. The project responds to the vision of the social economy for the 21st century formulated by Europe 2030 and the strategic goals of the institution” (IL5); “Lecturers participate in Business Enterprise Projects that develop student entrepreneurship as*

*participants, moderators, or experts. (Examples: Enterprise + <https://ekf.viko.lt/verslumopotencialo-vertinimas-enterprise-projekte> project administered by the German and Baltic Chambers of Commerce; Nordplus Horizontal sub-program of the Nordplus program Ent +)” (IL7); **membership in entrepreneurship-oriented associations:** “In 2020 a cooperation agreement was signed with the association “Lithuanian Social Innovation Cluster”, in 2021 - with Startup Lithuania, and this year our university will become a member of the Lithuanian Association of Responsible Business” (IL5); **meetings with the representatives from the regional businesses:** “Round table discussions are organized with business representatives of the region”(IS4); **sharing best practice with the colleagues:** “experience is shared by colleagues” (IL7).*



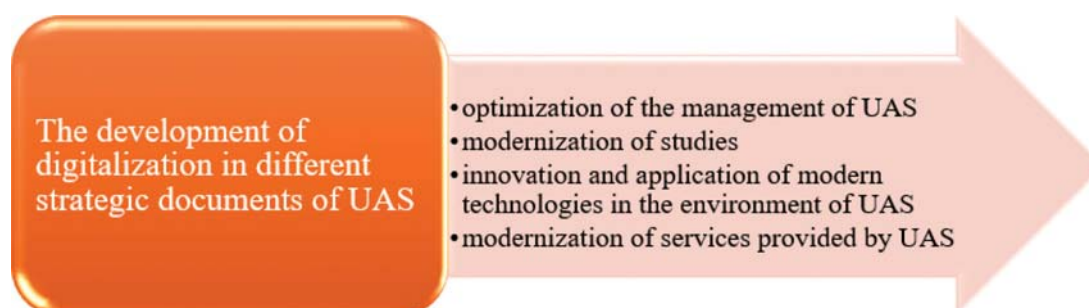
**Figure 4** Category “The Support of Uases to The Academic Staff in Developing Students’ Entrepreneurship Skills” and Subcategories

The development of digitalization is an important objective for all UASEs. They aim at providing high-quality and competitive studies that meet the expectations of students and the modern needs of society and the labor market. UAS relate digitalization with **optimization of the management of the University:** “In our Development Strategy for 2021-2030, a measure is provided <...> to develop the digitization of processes by optimizing the management of the university” (IS2); “One of the priority activities of our institution is to improve the repetitive processes and increase their efficiency by standardizing and digitizing them (which have not yet been

*standardized and digitized)” (IL5); “One of our strategic aims is the Improvement of operations and development of the strategic partnership. Improvement and Digitization of operational processes is planned” (IS6); “<...> increasing the efficiency of the digitized business processes of the university” (IL5); **modernization of studies:** “Digitization is emphasized in our strategy through the modernization of studies”, “<...> we will ensure the application of modern study models and didactic methods in the study process and will conduct studies based on close cooperation with business and industry” (IS1); “In our Development Strategy for 2021-2030 a measure is provided to*

*develop the offer of study methods and forms in response to the development of digitization in the study process” (IS2); “In the strategic activity plan of the University for 2019-2021, the goal is to improve the IT competencies of teachers” (IS2); “The study programs include subjects aimed at the formation of learners’ digital skills that meet the needs of industrial digitization” (IS3); “The measures of our strategic action plan are to improve the provision of the resources for studies and to digitize R&D and artistic performance in the*

*public repository of the institution” (IL7); **innovation and application of modern technologies:** “We understand innovation as the successful application of new technologies” (IS3), “The strategy of our university is to create a motivation environment based on modern technologies” (IS4); **modernization of services provided by UAS:** “The strategy for 2021 - 2025 includes the objective to develop the provision of services based on smart technologies” (IL5).*



**Figure 5** Category “The Development of Digitalization in Different Strategic Documents of UAS” and Subcategories

Assistance is provided to university academic and administrative staff seeking to use/using digital resources. Most UAS organize **training for the development of digital competence:** “Moodle trainings, distance learning didactic trainings, EduLab trainings” (IS1); “Teachers have the opportunity to participate in trainings and seminars” (IS4); “Training and consultations on the use of digital resources are provided” (IS6); “Training is provided for teachers and other staff” (IL7). **A considerable amount of time in teacher’s workload is allocated** for the development of digital competencies: “In the structure of the pedagogical workload, up to 60 non-contact work hours/one study credit are allocated for the preparation of an e-subject (module) for certification. (IL7)”; special **non-formal training programs** have been prepared for teachers’ digital competence development: “Our university develops and implements non-formal adult education programs for teachers”, for example:

“Preparation and Management of the Study Subject (Module) Description in the Virtual Learning Environment MOODLE”, “Presentation of the Interactive Collaboration Environment Padlet”, “Additional Opportunities for Creating Interactive Content Using H5P system”, “Additional video and audio integration possibilities in the virtual learning environment MOODLE”, “Hybrid learning design”, “Providing feedback, increasing student involvement and attending distance learning”, “Application of mobile applications in the study process”, “training on interactive whiteboards”, “Processing of data obtained by qualitative research methods with the tool MAXQDA”, “Plagiarism prevention and verification” (IL5); **separate university structural units are established** to help the staff in gaining and upgrading their digital competences: “We have an Information Technology Center that regularly advises lecturers and administrative staff on the use of digital resources. Free on-demand training

for teachers and administrators to learn how to work with new digital systems is provided" (IS2); UASes pay great attention to the **development of their digital infrastructure**: "We are constantly updating our digital infrastructure and introducing new digital systems into our business processes. e.g. a new information system has been introduced. This system is still in the process of developing, designing and programming new modules and

constantly updating existing ones, to maximize the convenience of those working with it and hoping for full benefits", "<...> our institution provides funding for the purchase and upgrade of software" (IS3); "Video conferencing cameras (106 pcs.), document cameras (29 pcs.), drawing-graphics tablets, installed workplaces, etc. were additionally purchased for the implementation of distance and hybrid studies (IL5)".



**Figure 6** Category "The Assistance Provided to UAS Academic and Administrative Staff Seeking to Use/Using Digital Resources" and Subcategories

UASes have taken supportive measures by applying different instruments and mechanisms to the development of students' entrepreneurial mindset and skills creating entrepreneurship-driven study environment for the students: **entrepreneurship-driven lectures and trainings**: "<...> our university organizes practical training for students, during which they get acquainted with the real activities of UAB Mantinga, and organizes meetings with young entrepreneurs in the region", "case studies of real business organizations, public lectures by business representatives on various topics related to entrepreneurship" (IS4); "We organize lectures and seminars, which are delivered by representatives of business enterprises" (IS6); "part of the lectures are given by guest lecturers from the business world" (IL7); **practical/experiential activities**: "<...> visits to business enterprises, internships in business enterprises and simulation companies, business modeling/simulation using computer business simulation/simulation programs), teamwork and interdisciplinary application

of knowledge in project preparation" (IL7); **entrepreneurship education events**: "Students, along with faculty, participate in a variety of entrepreneurship education competitions such as Profas" (IS1); "We regularly initiate projects, creative workshops, hackathons and other initiatives to develop students' entrepreneurial mindsets" (IS2); "Our students' team participated in the annual student entrepreneurship education event PROFADIENIS organized by Profat, the aim of which is to promote the interest of Lithuanian college students in business, to develop practical entrepreneurial skills in direct communication with representatives of the business sector" (IS3); "<...> Students are prepared to participate in international trade fair fairs (organized by the Simulith Center)", "the competition for business ideas Sustainable Business Today and Tomorrow" (2019), "international business and science forum Development of the circular economy in Lithuania and the EU" (IS4); "opportunity to participate <...> in challenge laboratories" (IL7); **collaborative projects with other higher**

**education institutions:** *“In the period of 2017-2021 we established intensive cooperation with the country’s universities, colleges and associated business structures in the field of entrepreneurship education, for example, “<...> KURK: creative, unique, caring generation with Klaipeda State College”, “Creative Workshops: Education of Students’ Entrepreneurship and Creativity in Northern, Central and Southern Lithuania (Creative Lab) with Vytautas Magnus University” (IS2), “Teachers and students participate in projects to promote entrepreneurship and creativity” (IS4); collaborative projects with businesses:* *“Seven Seas-Start of Entrepreneurship and Creativity” with the Lithuanian Employers’ Confederation, “CREAzone-the first step towards entrepreneurship and creativity” with the Lithuanian Business Confederation” (IS2); “opportunity to participate in various projects” (IL7); international projects:* *“From 2022 Erasmus + KA2 strategic partnership project*

*“Development of a Universal Work Environment-Based Virtual Internship Model and its support system” will be implemented, which will also contribute to entrepreneurship education in the College”(IS2); “Entrepreneurship projects funded by the EU Structural Funds: “Improving the Quality of Studies by Developing Students’ Entrepreneurial Skills” administered by the Vilnius Academy of Arts, and LINPRA administered the project “Development of Social Entrepreneurship and Creativity of Lithuanian Higher Education Students by Improving their Competences in the Labor Market and Society” (IS3); During the projects, students implemented innovative activities, creating a system of cooperation between students and business partners, strengthening students and their teachers’ interest in the country’s social problems and increasing motivation and skills by applying knowledge, practical professional skills, creativity, etc. available resources to deal with these problems on their own.*



**Figure 7.** Category “The Supportive Measures of UAS For the Development of Entrepreneurial Mindset and Skills” and Subcategories

A great majority of UAS has established a special structural unit for entrepreneurship education that organizes different activities for academic staff and students: **Knowledge and Technology Center:** The main function of the center is *“the development of entrepreneurial competencies of students and teachers by organizing various non-formal learning activities” (IS2); Science Shops:* *“They have been launched with the participation of our institution as a partner in the European*

*Commission’s Horizon 2020 research and innovation program “Enhancing Responsible Research and Innovation through Curricula in Higher Education” (EnRRICH)”. “<...> After the University started participating in this project, the concept of science workshops and the benefits of students’ participation for students and social partners were developed. Projects such as “Analysis of the Utilization of Vehicles in Vilnius”, “New Elements of Road Lane Marking”, “Smart Outdoor Bench” and*

many more were developed” (IS3); “<...> a Science Shop was launched in September 2021, where students develop applied research activities under the guidance of their teachers” (IL7); **Simulation Enterprises:** “We run a national Practice Enterprise SIMULITH, also known as a practice firm or virtual enterprise. It is a virtual company that runs like a real business simulating a real company’s business procedures, products, and services. The company unites 27 virtual practice enterprises in Lithuania” (IL7); “SE “Marko Mantingele” has been established and operates in our institution. Using the simulation training method, students do internships in the company” (IS4); “The Faculty of Business has a Simulation Company - Business Enterprise Model, developed for training purposes to develop entrepreneurship, simulating the activities of a real business enterprise in the areas of employee management, accounting, purchasing, sales and marketing and business processes. Imitation companies imitate the activities of real trade/ manufacturing companies and reflect all the processes taking place in a real company (without using real money or other tangible goods in the activity). <...> four classes of Simulation Companies have been created for the development of student entrepreneurship” (IL5); “<...> has a simulation company H&A Export, which

provides students and teachers with the opportunity to learn by working in a special virtual environment” (IS6); “2 simulation companies operate in the premises of the Faculty where students perform imitation practical tasks”; “The Faculty of Economics runs 2 Simulation Companies, <...> activities contribute to the promotion of entrepreneurship. <...> students are trained and encouraged to engage in the business of selling insurance services” (IL7); **Career Center:** “its staff provides individual counseling to students, training in general competencies on a variety of topics” (IL5); **Business Center:** “<...> the existing Business Center provides additional opportunities for students seeking to improve their entrepreneurial competence <...>: organizes a mentoring program based on non-formal learning (13 mentors); project activities, <...> assembles student teams for hackathons” (IL5); **specialized business environments:** “<...> cosmetology laboratories, where clients are served during internships - face and body care services are provided under real conditions”, <...> Veterinary Clinic and the VikoFlora Ornamental Plants and Planting Center, where students do internships in a real business environment” (IL7). Only one university has **no structural unit** for entrepreneurship education: “We have no center for entrepreneurship education” (IS1).



**Figure 8** Category “The Special Structural Units for Entrepreneurship Education within UAS” and Subcategories

Universities of applied sciences aim at building strong relations with different stakeholders. They often support teaching and learning and/or research activities by providing different material resources: **materials of special courses prepared by social partners:** “The Faculty of Business uses the materials of the Startup Guide, a constantly updated pre-acceleration course of the social partners “StartupLithuania” for training purposes: <https://startupguide.startuplithuania.com/courses/startup-abc/>; students acquire practical knowledge using the Spin CRM database system of the partners UAB Empera LT, based on a sustainable structure and fast data processing algorithms, which helps to automate business processes and monitor performance indicators: <https://www.spincrm.com/en/>, etc.” (IL5); **laboratories established by social partners:** “<...> social partners set up their own laboratories in our institution (Kitron Laboratory, Festo Laboratory, BCT Laboratory, Volkswagen Laboratory)” (IS1); **contracts with social partners:** “<...> students of the Information Management study program work under the concluded contract in Siauliai County Povilas Vishinskis Library and Siauliai County Archives. These stakeholders provide the opportunity to use modern specialized

equipment during practical classes, such as the SADC digitization equipment and the LIBIS system (Lithuanian Integrated Library Information System). Students have access to EAIS (Electronic Archive Information System) in the Siauliai County Archives. Using these resources, students perform practical tasks” (IS2); **students’ internships at social partners’ companies:** “Students in the field of transport engineering carry out production and final internships and some practical work at the major car companies <...> that use the latest technological process management methods, modern technologies and the most advanced equipment in the transport sector” (IS3); “students use the material base of the social partners during the internship” (IS6); **sponsorship for simulation enterprises:** “IE operating in the PHI uses the material base of UAB Mantinga” (IS4); “all students perform professional and final internships, <...> they use the material resources of the social partners to implement real professional tasks. Teachers are encouraged to do internships” (IL7);

It should be noted that UASes use social partners’ material resources mainly for teaching and learning purposes. No evidence was provided for the research purposes.



**Figure 9** Category “The Material Resources Provided by Social Partners for Teaching and/or Research Activities” and Subcategories

The informants mentioned a considerably low number of **computer/digital business simulation programs (games) used in the study process for the development of entrepreneurial skills**, though UASes pay great attention to the introduction of modern software. The most usual are: “<...> *business game “Kietas riesutas”* for modeling the company’s activities (IS2, IL5, IL7); a simulation company of IS4 is connected “*to the common network of the Simulith Center, the activities carried out by the company (connection to SODRA, the Bank, taxes)*”, “<...> *is a member of the PEN Worldwide Association since 2020 and joins the European network <https://www.penworldwide.org/start-your-practice-enterprise/>”; institutions are using the platform of SIMULITH, a virtual practice enterprise that runs a real business simulating a real company’s procedures, products, and services: “*We use a special program created for the Lithuanian market Simu market imitating a bank, purchases, and sales, taxes. PEN Worldwide Online Services IT platform has been developed for the international market, connecting electronic services to the global IB network, which include: database, advanced IB search, e-shops, banking services, credit card registration system, quality certificate registration system, calendar of activities and events, statistics*” (IS6); “*Sim Venture*” (IL7).*

UAS have accumulated a big amount of best practices of entrepreneurship education: **special entrepreneurship-driven structural units within the university**: “*The Racing Division*” (IS1); **international entrepreneurship promotion projects**: “*Space for the Expression of Youth Entrepreneurship Initiatives: SVAKO Entrepreneurship Laboratory financed by the State Studies Foundation, which was attended by more than 350 college students and 110 foreign students*” (IS2); “*In 2019 and 2020 two projects of the Lithuanian-Polish Youth Exchange Fund on social business were implemented by the Department of Youth Affairs under the Ministry of Social Security and Labor of the Republic of Lithuania: “Sharing good examples of social business” (2019) and*

*“Social business-connecting people to solve social problems” (2020). The projects included five days of training for students of the faculty of Economics and the University of Economics in Krakow. During the training, social business ideas were developed and lecturers were invited to present their social businesses in Poland and Lithuania. Students’ entrepreneurial competencies are developed” (IL7); Science Shops: “An example of good practice in entrepreneurship education is Science Shops projects” (IS3, IL7); RDI projects: “The experimental development project “Transport Generation” of transport engineering students was launched in cooperation with the Lithuanian Karting Federation, UAB Enerigus Power Solutions and UAB Audatex Baltics, which provided financial support for the implementation of the project. During the implementation of the project, the students prepared the following projects”: “Electric current frame construction project” “Electric current body elements and wings design”; “Electric Generator Motor Power System Project”, “Electric Generator PMAC-G4845 Generation Adaptation Project” (IS3); “A student of Electrical Engineering won and implemented the project<...>. Project of the Lithuanian Science Council of the European Union Funds Investment Operational Program following the activity “Measure of students’ abilities to carry out the scientific competence of scientists, other researchers, students” of the measure 09.3.3-LMT-K-712-16-0094 of the European Union Funds Investment Operational Program 2014–2020 through practical research activities”, “Development of students’ skills in research during the semester”. Based on the project 2017-2018 s.m. the student conducted a research project “Kinetic Wind Energy Collection Using Piezoelectric Materials”. Based on the results of these researches, the student prepared a scientific publication and defended a professional bachelor final thesis” (IS3); **commissioned projects**: “A commissioned project was completed with the Skulas gas station network. Teachers and students from different faculties worked in a joint team in the*



*creation of a healthy menu” (IL7)”; **international student entrepreneurship promotion events:** “History of Thing: Entrepreneurship Workshop (2020), during which students from 10 different Lithuanian and foreign higher education institutions, in interdisciplinary teams, developed and presented business ideas that respond to the principles of the circular economy. Participants deepened their theoretical knowledge and strengthened their practical skills in the areas of entrepreneurship, external communication, and creativity, as well as improve their intercultural communication and teamwork skills. The social partners and business representatives also took part in the seminars organized during the event” (IL5); **creative workshops:** “Entrepreneurship + Creativity =? (2021), the aim of which is to develop entrepreneurial skills, creative thinking, and abilities of students who associate their profession with the arts. <...>. The results reflect the readiness of the camp participants to develop economic activities and to represent them properly and creatively in the future” (IL5);*

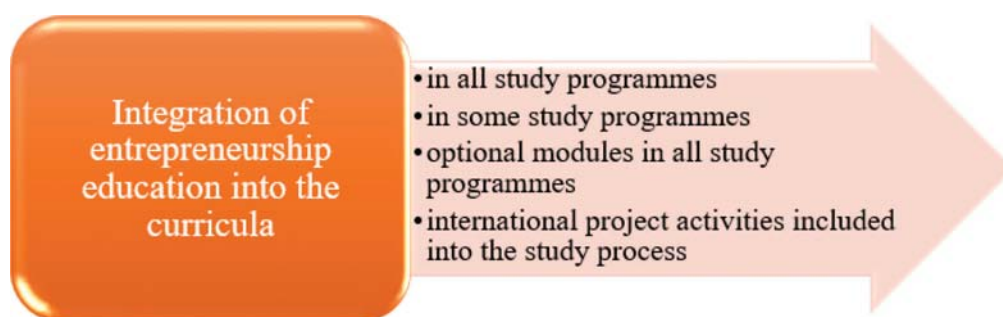
***competitions:** “Together with the lecturers, the students take part in the competition “Entrepreneurship Mania”, a competition for student entrepreneurship at the University of Economics in Bydgoszcz, Poland”(IS6); **conferences:** “Innovative (eco) technologies, entrepreneurship, and regional development”, “Strengthening the Regional Dimension: Promoting Entrepreneurship through Local Heritage and Resources through Experiential Learning”, (IS6); **career days:** “We organize very popular and multi-participant career days every year, the aim of which is to introduce students to institutions, companies and other organizations in order to establish useful contacts for the career path, to discover volunteering, internships and job opportunities moved to the virtual space” (IL5); **graduates’ success stories:** “Graduates of the University have established their own successful businesses. Businesses are set up according to business plans that have been prepared as student final theses”(IL7).*



**Figure 10** Category “The Best Practices of Entrepreneurship Education” and Subcategories

As entrepreneurship competence is one of the most important for the professional career of graduates, it is relevant to integrate entrepreneurship education into the university curricula. All UAS declare that entrepreneurship education has been integrated, but in different ways: **in all study programmes:** “Entrepreneurial education is integrated into various study subjects and modules. For example, internships at the Faculty of Business in Simulation Companies are performed by students of the Accounting, Finance, Sales and Marketing, Institutional and Corporate Administration and International Business study programs; the optional module “From idea to business” is implemented” (IL5); “Entrepreneurship education is integrated into all study programmes. Curricula include subjects in which entrepreneurial skills are developed, e.g. Economic Theory, Business Economics, Project Management, Interdisciplinary Project”; (IS3); **in some study programmes:** “In some study programmes entrepreneurship education is integrated into the curriculum, e.g. in the Business and Institutional Administration study programme students study Entrepreneurship and Leadership, in the International Business study program students study International Business Organization and Business Simulation Practice, International Business Negotiation and Intercultural Communication” (IS1); “Conditions for developing entrepreneurial skills have been created for students of all study programmes. Entrepreneurship education is especially emphasized in the group of business and public

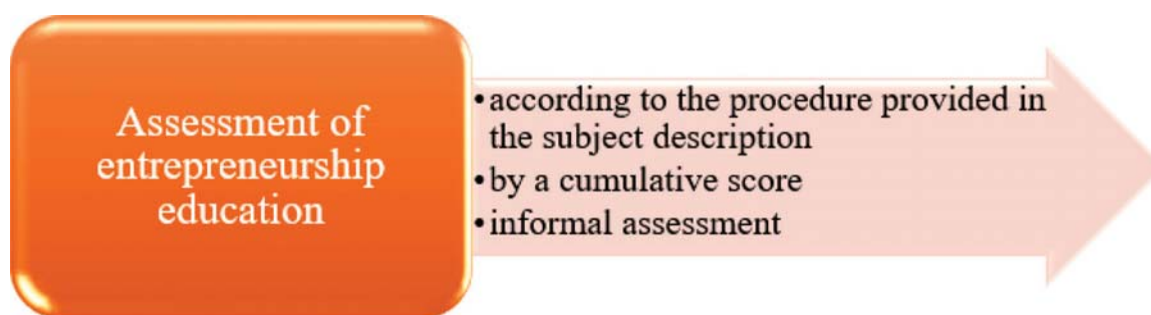
management study fields (Accounting, Finance, Production and Logistics Management, International Business, Administration of Enterprises and Institutions)” (IS2, IS3); “A subject of “Management and Entrepreneurship” is integrated into the study programmes of Accounting, Sustainable Business Management, International Business Management, Transport Logistics, Business English and Communication” (IS4); “Students in all degree programmes are provided with entrepreneurial knowledge and skills, except for the General Practice Nursing and Physiotherapy degree programmes” (IS6); “Entrepreneurship is developed in all study programmes conducted at the Faculties of Electronics and Informatics, Business Management, Health Care and Economics Faculties” (IL7); **optional modules in all study programmes:** “These are optional modules (Business Economics and Management, Personal and Corporate Finance) that students in all degree programmes can choose from” (IS1); the optional module “From idea to business” is implemented IL5); “General Practice Nursing and Physiotherapy degree programme students can acquire these skills by choosing electives” (IS6); **international project activities included into the study process:** “Also, project activities are included in the study process, e.g. the international project “B2B Lithuania-Netherlands” was implemented <...>, students got acquainted with almost 30 different businesses and analyzed business development opportunities in Lithuania and the EU” (IL5).



**Figure 11** Category “The Integration of Entrepreneurship Education Into the Curricula” and Subcategories

Informants were asked to explain how the achieved learning outcomes are assessed in their universities. In Lithuania, there is no national requirement for a specific assessment of entrepreneurship education. Higher education institutions have their own assessment systems. The most common way of assessment is **according to the procedure provided in the subject description**: “If it is a study subject or a separate study subject topic or learning outcome, then it is assessed according to the procedure provided in the subject description” (IS2); “The level of students’ knowledge is determined according to the assessment criteria specified in the subject descriptions” (IS3); “Entrepreneurship learning outcomes

are assessed using the same assessment methodology as other learning outcomes” (IL5); “Students’ entrepreneurship achievements results are assessed according to the learning outcomes expected to be achieved in the subjects, e.g. preparation and presentation of a business plan” (IS6); by a **cumulative score**: “Entrepreneurship learning outcomes are assessed by a cumulative score, assessing the tasks completed by students” (IS1); **informal assessment**: “Informal assessment is possible through projects and other initiatives (IS2)”; “During project activities<...> students may be awarded a registered certificate, which provides the intended number of study credits” (IL5).



**Figure 12** Category “The Assessment of Entrepreneurship Education” and Subcategories

Professional higher education is oriented to the acquisition of practical skills. Therefore, UASes strive for close collaboration with companies and public organizations for the development of the study programs to be relevant to the changing needs of the labor market. Universities closely cooperate with employers’ companies, associated business structures, institutions, organizations, professional associations at all levels—from the organization of joint events to the discussion of the most important operational issues in the UAS Council. Representatives of different stakeholders participate **in the study fields committees**: “The social partners participate in the activities of the study field committees” (IL5); **in the study programme committees**: “The inclusion of business representatives in the study programme/field committees is mandatory and regulated by law. Feedback from employers

on the preparation of students for practical activities and reports from members of the final thesis (project) defense commissions serve for the improvement of study programs” (IL7); “study programmes have their own study committees, which include stakeholders who are involved in both the design and development of the programmes and the accreditation process. Stakeholders provide topics for final and coursework, and give integrated lectures to students” (IS1); “Problematic issues arising during the preparation, implementation and renewal of study programmes are discussed with employers” (IS2); “Study programme committees are responsible for the development and quality of study programmes, in the activities of which teachers, students and social stakeholders participate” (IS3); “Stakeholders participate in the meetings of the study programme committees, where the process of preparation

of study programmes or decisions on renewal of study programmes is discussed” (IS3); “Representatives of social partners participate in the study programme development group and academic activities: study programme committees <...>” (IS4); “The social partners are invited to participate in the study programme development committee, express their views on the need for a new study programme, share experiences in general discussions and make concrete proposals in formulating the programme objectives and learning outcomes, discuss the future competence of the specialist” (IL5); “We involve external stakeholders in the development and improvement of study programmes by involving them in working or

development working groups and by providing feedback” (IS6); **qualification commissions:** “Representatives of social partners participate in the study programme development group and academic activities: <...> final work qualification commissions <...>” (IS4); “participate in the evaluation of final theses” (IL5), **provide internship placements:** “create internships for students” (IL5); **round table discussions:** “We organize annual round table discussions with stakeholders on the renewal of study programmes in each field of study” (IS3); **perform teaching and RDI activities:** “give lectures and at the same time carry out applied research” (IL5).



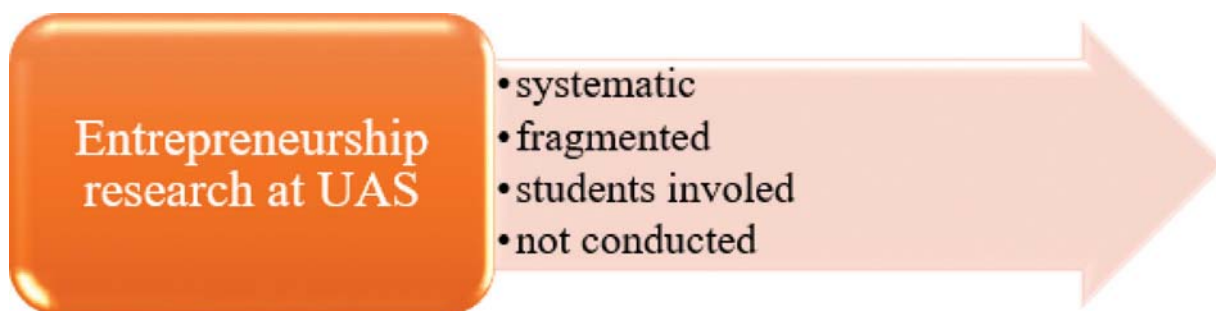
**Figure 13** Category “The Involvement of External Stakeholders into the Development of Study Programmes” and Subcategories

Universities of applied sciences in Lithuania not only provide professional bachelor’s degree studies but conduct user-oriented research that is expected to have an impact on the country and regional development. The informants were asked to share the experience of their universities in entrepreneurship research. Some universities **do not conduct entrepreneurship research:** “We do not conduct entrepreneurship research our institution specializes in engineering” (IS1); “entrepreneurship research is not conducted” (IS3). Most of the universities demonstrate **fragmented examples of entrepreneurship research:** “Surveys of entrepreneurial competencies and abilities, such as self-directed learning abilities, have been conducted. The results

of the research are used in the study subject “Entrepreneurship and Leadership”” (IS2); “Development of Students’ Entrepreneurial Skills at IS4”, commissioned survey “Consumer Opinions on Dissemination of Information and Communication of the EU and Its Institutions at the Europe Direct Information Center (EDIC)” was conducted” (IS4); “2020 international study “The Youth In The Light of Entrepreneurship. Entrepreneurship In The Light of Innovations”, the results of which have been presented at three international conferences; project “Effects of Green Zones Implementation from the Perspective of Sustainable Development: The Case of X City” is being implemented, during which the economic, social and environmental effects of green zones implementation in the

city are being studied and suggestions are being made to improve the implementation of the student and scientific competence and ability to carry out practical scientific activities” (IL5); **more systematic entrepreneurial research:** “In 2020-2021 our faculty of Business Management conducted applied entrepreneurship research “Economic Indicators of Business Tourism and Their Influence on the National Economy”. It was carried out by the Lithuanian Association of Conferences and Events. Teachers integrate examples into the content of their lectures share good practice, engage students into research activities”; “The project “Matching Work and Study: The Case of UAS” was funded by the Ministry of Education and Science and implemented by students of the Student Research Community under the guidance of a Faculty lecturer”; “The Faculty of Electronics and Informatics

is conducting a follow-up study on Student Creativity and Entrepreneurship. The research revealed that students especially want imitation business games, meetings with successful entrepreneurs, creative team assignments. Based on the results of the research, the subject of Company Economics is completed with the imitation business game “Hard Nut”, Business Planning - with the preparation of a business plan, as well as some subjects are completed with creative group projects. Student trips to innovative businesses are organized, lectures invite successful entrepreneurs, presentations of student work, discussions and debates are organized” (IL7); **students involved:** “some of them are run exclusively with students” (IL5); “The project “Matching Work and Study: The Case of UASes” was implemented by students of the Student Research Community under the guidance of a Faculty lecturer” (IL7);



**Figure 14** Category “The Entrepreneurship Research at UAS” and Subcategories

Academic community-students, teachers, researchers, and graduates are encouraged to start their own business, although HEIs admit, that there is **no systematic incentive system** (IS1, IL7, IS3): **financial support:** “<...> student’s initiative to open a sports car club was supported by scholarships, later helping to buy a race car and providing premises to open the workshop <...>” (IS1); “The university community is provided with the necessary computer equipment, premises, and other facilities” (IL5); **empowered entrepreneur gatherings:** “In 2020 the Young Business Club was formed together with the City Municipality” (IS2); “in 2021 the team of the

university students won a financial prize and the opportunity to participate in GoTech Accelerator and LitBAN Pitch events in the hackathon Co-create Our Future Together” (IL5); **knowledge sharing:** “trainings, meetings with business representatives, examples of good practice” (IS2); “ongoing mentoring program” (IS1); “students are introduced to start-up procedures and legal regulations <...> they prepare business plan”, “Information Systems Technology student implemented a product quality assessment system at UAB Mantinga” (IS3); “the knowledge gained during the studies is often the basis for starting one’s own business” (IL7).



**Figure 15** Category “The Support Provided by the UAS for the Academic Staff, Students, Graduates” and Subcategories

Having the ability to commercialize services is undoubtedly a survival necessity for entrepreneurial UAS researchers, teachers, and students. The following activities are commercialized: **non-formal education training:** “non-formal education training are organized by teachers and researchers” (IS1); “Accounting: basics and advanced practical studies” (IL5); “Creativity training according to the methodology of the Creativity Platform is successfully sold, the training are conducted by the university teachers” (IL7); **new product or service development:** “the university teacher in collaboration with student-designed, programmed and implemented transportation management system <...> which is being used by UAB PrintPlius LT <...>” (IS2); “the cooperation between the University and the Ministry of Economics and Innovation continues with the announcement of a competition for a new Ministry logo and style book. <...> the design projects created by the students were submitted to the client <...>” (IS3); “website and information system design and development, game and mobile application programming, development of printed and

*electronic publications and advertisements” (IS6); commissioned research: “university students, in consultation with teachers, carry out commissioned research” (IS3); “the lecturers of the University conducted a commissioned research of the Europe Direct Marijampole Information Center” (IS4); “services of the University researchers, teachers and students are sold to business <...> commissioned research on organizational microclimate assessment, food quality and safety control assessment, sensory evaluation of food products, etc.” (IS6); “research teams carried out 7 commissioned research last year” (IL7). On the other hand, UAS admit that the culture of the **commercialization of the provided services is relatively new** takes first steps in the university-business collaboration. “in order to create opportunities for students to operate in a real business environment, informal activities with some financial reward are organized, although the academic services are not commercialized” (IS4). “The commissioned research activities have just begun to be implemented <...> higher-value orders re-planned shortly” (IL7).*



**Figure 16** Category “The Commercialization of Services” and Subcategories

Informal mechanisms of knowledge transfer towards entrepreneurship and the launch of new ventures are seen as significant as formal teaching and learning. The knowledge is given to **students, teachers, unclassified students, social partners**: “*Entrepreneurial knowledge and skills are provided to both-the university staff and students. Social partners are also invited to participate in organized non-formal activities*” (IS2, IL5, IS6, IL7). **The number of the participants** in the non-formal entrepreneurial teaching and learning is **increasing**: “*the annual improvement and increase of entrepreneurial activities resulted in a growing involvement of participants, e.g. 200 participants in the year 2021 in comparison to 100 participants in 2020*” (IL5); “*352 students improved their entrepreneurial skills during 2021*” (IS2); “*entrepreneurial knowledge and skills are provided to all students and a growing number of teachers and social partners each year*” (IL7); “*an average of 200 students each year*” (IS6); Universities of Applied Sciences recognize a variety of informal entrepreneurial activities: **events**: “*various informal activities are carried out together with students, academic community provid commissioned services in the region*” (IS1); “*entrepreneurial knowledge and skills are provided informally by enabling students to take part in various competitions outside the University, <...>, students are also involved in a variety of creative projects*” (IS3); “*students and teachers participate in entrepreneurship education projects, trainings,*

*creative workshops, hackathons, conferences and other initiatives*” (IS2); “*consultations, project activities, practical seminars, trainings, hackathons, etc. are carried out*” (IL5); “*events (e.g. Global Entrepreneurship Week, hackathons, Creativity Camp, Economists’ Week, etc)*” (IL5); **scientific activities**: “*students and lecturers participate in the traditional biennial scientific conference “Business, Studies and Me”*” (IS2); *students’ conference “Youth in a Changing Society”*” (IL7); **non-formal educational programs**: “*the non-formal education program Personal Business Opportunities in Contemporary Ceramics, seminars <...> “Improving the Quality of Studies by Developing Students’ Entrepreneurial Skills”*” (IS3); “*seminars and trainings are organized, business representatives are invited to give open lectures, and trips to business companies are organized*” (IS6). Universities create **new opportunities** for the entrepreneurship teaching and learning: “*new activities appear every year to complement the previous ones*” (IS1); “*future initiatives are planned mainly through participation in new international, national and regional projects*” (IS2); “*there are more and more competitions and other opportunities for students to improve their entrepreneurial skills*” (IS3); “*the network of social partners is expanding every year, allowing <...> to create event programs focused on the development of competencies required for the labor market*” (IL5); “*a wider range of trainings for the University staff and students are offered*” (IL7).



**Figure 17** Category “The Informal Entrepreneurship Teaching” and Subcategories

Role models are often suggested as a way of motivating individuals to set and achieve ambitious goals. Academic community of the interviewed universities is entrepreneurially guided by role models in a following ways: **lectures delivered by professionals in the field:** “lectures given by graduates and business representatives are regularly held at the University” (IS1); “inspiring examples were presented by business founders” (IS2); “representatives of business enterprises give public lectures” (IS3) “representatives of Lithuanian and foreign business give lectures” (IS6); “Both staff and students invite business people to share their knowledge during the lectures” (IL7); **challenges:** “Students are challenged by business partners to refine a

*business idea and develop an initial business model” (IS2); “business people challenge students during various University events to develop non-standard business ideas” (IL7); **alumni success stories:** “alumni discussion “My Success Story”” (IS2); “graduates who have established businesses share their success stories” (IS6); “graduates, CEOs of the company share their success stories during the University events, <...> alumni success stories are shared on the University webpage and social media” (IL7); **company visits:** “study trips - educational lectures in a real business environment” (IS3); “company visits are organized for both students and professionals to network and gain insights” (IL7).*



**Figure 18** Category “The Motivation to Act Entrepreneurially” and Subcategories



Reward systems are a critical fundamental of the entrepreneurial university. This is because the university can shape the behavior of the academic community and the overall organizational culture. The academic community is motivated: **financially**: “members of the academic community, especially students, are encouraged financially” (IS2); “participation of students and teachers in various competitions

*is financially supported” (IS1); “valuable prizes” (IS2); “teachers and researchers are paid extra for additional entrepreneurial activities” (IS6); “scholarships from businesses” (IL7); “prizes, vouchers, etc.”(IL7) non-financially: “certificates, development of competence portfolio” (IS2); recognition of non-formal learning (IS2, IL7); certificates(IL7).*



**Figure 19** Category “The Rewarding System” and Subcategories

The universities admit that rewards (financial and non-financial) play an extremely important role in motivating the academic community to engage in entrepreneurial activities.

## Conclusions

It is important to underline that the changes facing society today claim a continuous and thoughtful entrepreneurship development and growth of digitalization. Therefore, universities of applied sciences are part of an entrepreneurial society in collaboration with industry, engaging the participants into the entrepreneurial process.

The results of the survey show that entrepreneurship education in the Lithuanian universities of applied sciences is perceived as one of the most important strategic objectives, although the majority institutions do not express that explicitly in their strategic documents. Entrepreneurship education in most UAS is associated with meeting the needs of the society and labor market.

Although these higher education institutions demonstrate a wide range of activities focused on entrepreneurship education, most of them lack a systematic

background. Lithuanian universities of applied sciences have accumulated valuable experience in the development of academic staff competencies, organization of different entrepreneurship-driven events, but there is a lack of more targeted integration of entrepreneurship into the study programmes and overall institutional culture.

There are multiple types of entrepreneurship center models at Lithuanian UAS, including Business centers, Simulation enterprises, Science Shops, etc. engage more and more academic staff to build entrepreneurial ecosystem.

Although the academic community is encouraged to launch their own businesses, a lack of systematic incentive system result in a relatively low number of start-ups.

Entrepreneurial research is rather fragmented, and the involvement of business representatives and students in the research activities is inconsistent. Development of a more systematic understanding of the outcomes and impacts of university-business collaboration activities in the field of research is required to lead the collaboration to another level-commercialization.

The development of digitalization is one of the most important tasks for the Lithuanian

universities of applied sciences. The pandemic period has significantly accelerated the deployment of digital technologies in the studies and institutional management, as well

as the rapid acquisition of related competencies. Institutions pay great attention to the development and continuous improvement of digital infrastructure.

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