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WP2: Enhancing Entrepreneurship Education and Skills Development












D 2.1 Report on status quo on entrepreneurship education, labour
market requirements and knowledge/skills mismatches

Tashkent State Transport University, Uzbekistan



Triggering innovative approaches and entrepreneurial skills for students through creating conditions for
graduate's employability in Central Asia

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1. Introduction

Tashkent State Transport University is organized in accordance with the Resolution of the President of the Republic of Uzbekistan dated May 4, 2020 No PP-4703 on the basis of the Ministry of Transport of the Republic of Uzbekistan, the Ministry of Higher and Secondary Special Education and the Tashkent Institute of Railway Engineers, Tashkent Institute of Design, Construction and Maintenance of Automobile Roads and the Faculty of Aerospace Technology of Tashkent State Technical University in order to radically improve the system of training highly qualified personnel for the transport sector. The head of the university is Abdurakhmanov Adil Kalandarovich.

Currently, the university has a large sports complex, dormitories and a canteen. As a result of the work done at the university, all conditions have been created for the realization of the creative abilities of students, a sports club, modern comfortable dormitories, a scientific student society. In student practice, many simulators and laboratory installations are used.

The long-term creative cooperation of university scientists and railway workers contributes to the improvement of the qualifications of scientific and pedagogical personnel and the strengthening of the material base of the university. Staff and students enjoy a wide range of computing services. State-of-the-art computing facilities support teaching, learning and research activities. Over 1200 computers are installed in forty-five computer classes. Access is available to all kinds of electronic information, including bibliographic databases, electronic journals and online news services. These are also available mostly on networked PCs. The scientific library stocks over 800 thousand books and periodicals.

The TSTU has 8 faculties:

- Faculty of Railway transport engineering which offers the following bachelor degree programs: vocational education (land transport systems and their exploitation (locomotives)), land transport systems and their exploitation, machine-building technology, equipment and automation of machine-building production, materials Science and new materials technology, electric transport (Metropolitan). Duration of the programs: 4 years; Language of instruction: Uzbek and Russian.
- Faculty of Electrical Engineering and computer engineering which offers the following bachelor degree programs: electronic devices and systems (railway), electrical power engineering (by sectors), electrical engineering, electrical mechanics and Electrical Technology (Railway transport), automation and management of technological processes and production (railway).
- Faculty of Economics offers the following bachelor degree programs: economy, management (project management in the field of transport), marketing, accounting and audit, corporate governance, production organization and management, digital economy (transport), jurisprudence (international transport law), information systems and technologies, software engineering.
- Faculty of construction offers the following bachelor degree programs: construction and installation of

engineering communications (water supply and sewerage systems on railway tracks), construction of buildings and structures (transport buildings).

- Faculty of Aviation transport engineering which offers the following bachelor degree programs: technical exploitation of aircraft, aircraft, technical and technological exploitation of unmanned aviation equipment, aviation Engineering (Aircraft Engineering), aviation Engineering (unmanned aircraft aviation complexes), design and operation of drones, air traffic control, applied universe technologies.
- Faculty of Transport Logistics which offers the following bachelor degree programs: transportation Organization and transport Logistics (railway transport), intellectual engineering systems (car transport), organization of road traffic, maintenance techniques and technology, transport Logistics, safety of vital activity, labor protection and Technical Safety.
- Faculty of Automotive engineering which offers the following bachelor degree programs: transport the exploitation of cars, road-building machinery and equipment, car service, ecology and Environmental Protection, Metrology, standardization and product quality management.
- Faculty of Electrical Engineering and computer engineering offer the following bachelor degree programs: electrical Engineering, Electrical Mechanics and Electrical Technology (Railway Transport), electricity (railway transport), automation and control of technological processes and production (railway transport), radio electronic devices and systems (railway transport), electricity (railway transport), electricity (railway transport), electrical engineering, electro mechanics and electrical technology (railway transport), automation and control of technological processes and production (railway transport).

For full-time education Duration of the programs: 4 years and for extra-mural education 5 years; Language of instruction: Uzbek and Russian. More than 11115 students study at the university, of which 10663 are bachelors in 74 specialties and 452 masters in 51 specialties.

The scientific and pedagogical staff of the University has 701 teaching staff, 53 doctors of sciences - professors, 173 candidates of sciences - associate professors, 475 senior teachers and assistants.

The present report provides an overview of the status quo of entrepreneurship education at Tashkent State Transport University and aims to identify related labour market requirements and possible knowledge/skills mismatches of university graduates. The report was developed as part of Work Package 2 on “Enhancing Entrepreneurship Education and Skills Development” (WP2) of the Erasmus+ Capacity Building in Higher Education Project “Triggering innovative approaches and entrepreneurial skills for students through creating conditions for graduate’s employability in Central Asia” (TRIGGER).

The report first provides an overview of the current offer in entrepreneurship education at the university.

Second, relevant results of the HEI self-assessment provided on the HEInnovate¹ tool in WP1 conducted based.² For the requirements of WP2 the present report specifically looks at the self-assessment findings of the university for the HEInnovate dimensions “Entrepreneurial Teaching and Learning” and “Preparing and Supporting Entrepreneurs”.³ Third, results of a survey among employers and graduates are provided to identify labour market qualification requirements and possible skills mismatches for graduates in the field of entrepreneurial skills. The survey was implemented by the university in spring 2021 as part of WP2. Fourth, a summarizing discussion of the identified gaps and skills mismatches is provided. In sum, the mentioned aspects allow for comprehensive audit of the state of entrepreneurship education at the university. Finally, conclusions for the further development of entrepreneurship education at the university are derived.

Before digging deeper into the status of entrepreneurship education at the university, this section closes with a summary on the notion of entrepreneurship education as adopted in the TRIGGER project:

- **Entrepreneurship Education (EE)** seeks to provide students with knowledge, skills and motivation to create ideas in entrepreneurial action in different environments, both as self-employed entrepreneur and as employee in established organisations (EC 2015, Lackéus et al. 2020).
- **Entrepreneurship** is a key competence for all learners, supporting personal development, active citizenship, social inclusion and employability (see European Commission et al. 2016: 21).
- **Organizational change** of HEIs is needed, since „the capacity to implement the entrepreneurship and innovation agenda depends on the governance arrangements, organisational capacity and the institutional culture of HEIs as well as characteristics of the surrounding economy“ (OECD 2019: 12).

2. Overview of current offer in entrepreneurship education at the HEI

This section provides an overview of the status quo of entrepreneurship education at the university, looking at BA, MA, and PhD levels.

2.1. Existing entrepreneurship education offer at BA level

Our university trains economists in 5 types of bachelor's degrees: Economics, Management, Marketing, Accounting and Audit, Organization and Management of Production.

¹ For further details see: <https://heinnovate.eu/en>

² For further detail see Deliverable 1.1 on “The Methodology for the Analyses of HEI preparedness for future challenges” of Work Package 1.

³ For further results of the self-assessment along all 8 HEInnovate dimensions see Deliverable 1.2 “The Report on HEI preparedness for future challenges in CA countries” of Work Package 1.

The curricula of these areas include several basic disciplines, such as: "Economic Theory", "Microeconomics", "Macroeconomics", "Management", "Marketing", "Economic analysis", "Analysis of investment projects", "Economics of railway Transport", "Statistics", "Accounting", contributing to the acquisition of economic knowledge.

In addition to the higher education of these subjects, a number of disciplines are taught that are aimed at obtaining entrepreneurial activity, in particular, the subject "Business Planning" is the main generalizing document, contains the planned range of products, as well as the volume of production, sales market and characteristics of the raw material base, the need for production in land, energy and labor resources and data related to the generalized indicator of economic efficiency.

"Business Planning" studies comprehensive knowledge of the principles and laws of business planning as one of the management tools, the formation of knowledge and the acquisition by students of the necessary qualifications to understand the essence of business planning, its role and place in the activities of the enterprise as a tool to achieve business goals.

The purpose of the discipline is to develop students' skills and qualifications for the development and implementation of business plan documents, as well as determining the strategy and tactics of doing business.

The objectives of the discipline are business planning, the study of modern methods of planning technology; determination of the structure and content of the business plan; the study of methods of planning sections of the business plan; the study of the mechanism of promotion of the business plan; the study of the methodology for evaluating the effectiveness of the business plan.

In addition, the subject "Fundamentals of Entrepreneurship" is taught in engineering areas at our university in the amount of 60 hours or four credits.

2.2. Existing entrepreneurship education offer at MA level

Students study at our university in several areas of the Master's degree program. In particular, in the specialties of Economics, Corporate Governance and Accounting. Unfortunately, at the master's level, we do not conduct classes/courses on entrepreneurship development.

Since the 2020-2021 academic year, the state has authorized each university to make changes to curricula/courses and initiate extracurricular activities, although curricula are regulated by state educational standards, each university has the right to change/update curricula and courses from 40 to 50%.

It should be noted that after participating in the TREGGER project, the leadership of our university is considering introducing the subject "Innovative Entrepreneurship" into the curriculum in engineering areas.

2.3. Existing entrepreneurship education offer at PhD level

In our university, the in postgraduate program focuses on research activities. And doctoral students

independently raise their level of entrepreneurial activity.

2.4. Other activities in entrepreneurship education

In addition to the above-mentioned university programs for the development of entrepreneurial activity, a number of activities carried out that have a positive effect on the development of this activity. For example, at the level of the university, one of the famous entrepreneurs, named Mehriniso Abdurazzakova "Business coach for entrepreneurship", held master classes over the past years.

1. From the founders of such brands as "Decos", "Deli", "Office market" by brothers Hasan and Husan Mamasaidov, on the topic "Factors of victory and defeat";
2. The founder of the company "Ertak", vice-president of "Uzbek martial arts", deputy head of the Tashkent branch of the national movement "Yuksalish", entrepreneur Bobur Rasulov;
3. The founder of the training center "Mashhura", "the chairman of the Association of non-state educational institutions", also the founder of the Business Academy "Avlod 21", investor Anvar Yusupov;
4. The head of the project "Center for Support of Youth Entrepreneurship of Uzbekistan", named Mamadaminova Dilfuza Azamatovna; taught girls who were interested in business Business lessons in our university.
5. With the help of M-Factor leaders, a number of business lessons and master classes conducted from the most successful entrepreneurs of Uzbekistan.

In addition, a professor at the University of Iowa (USA) - T. Koffelt was invited to conduct a business seminar on the topic "World practice of project management".

2.5. National/institutional regulations to implement changes at the course level and to initiate new extra-curricular activities

Nowadays, in Uzbekistan at the national level, educational programs and courses are coordinated by the job industry and, if necessary, changes are made to the curriculum. And since this year, the subject "Innovative Entrepreneurship" has been added in the direction of Economics and Digital Economy.

The subject "Innovative entrepreneurship" studies the process of creation and commercial use of technical and technological innovations. Entrepreneurship is based on innovation in the field of products or services, which allows creating a new market, meeting new needs. Innovations serve as a specific tool of entrepreneurship, and not innovations in themselves, but a directed organized search for innovations, a constant focus on them by business structures. Thus, the task of the entrepreneur-innovator is to reform and revolutionize the way of production by introducing inventions, and in a more general sense - through the use of new technological capabilities for the production of fundamentally new goods or the production of old goods by new methods,

thanks to the discovery of a new source of raw materials or a new market for finished products - up to the reorganization of the former and the creation of a new branch of the economy.

Innovative entrepreneurship is a special innovative process of creating something new, the process of management, which is based on the constant search for new opportunities, orientation to innovation. It is associated with the willingness of the entrepreneur to take on all the risk of implementing a new project or improving an existing one, as well as the resulting financial, moral and social responsibility. In general, innovative entrepreneurship can be defined as a social technical economic process that leads to the creation of the best in their properties of goods (products, services) and technologies through the practical use of innovations. There are three main types of innovative entrepreneurship in the economic literature:

1. product innovation;
2. technology innovation;
3. social innovation.

Based on the way of organizing the innovation process in the company, three models of innovative entrepreneurship can be distinguished:

1. innovative entrepreneurship based on internal organization, when an innovation is created and (or) mastered within the company by its specialized departments on the basis of planning and monitoring their interaction on an innovative project;
2. innovative entrepreneurship based on an external organization with the help of contracts, when an order for the creation and (or) development of innovation is placed between third-party organizations;
3. innovative entrepreneurship on the basis of an external organization with the help of ventures, when a firm establishes subsidiary venture firms that attract additional third-party funds to implement an innovative project.

3. Results of the HEI self-assessment for the dimension “Entrepreneurial Teaching and Learning” and “Preparing and Supporting Entrepreneurs”

As part of WP1 a HEI self-assessment was conducted based on the HEI tool. For the requirements of WP2 this section specifically looks at the self-assessment results of the university for the HEI dimensions “Entrepreneurial Teaching and Learning” and “Preparing and Supporting Entrepreneurs”.

3.1. Dimension “Entrepreneurial Teaching and Learning”

According to the results of the survey and the D1.2 report, the average score was 4.1 points, which is a high indicator. University readiness for future challenges for the Teaching and Learning Entrepreneurship

dimension, it can be concluded that entrepreneurship education and trainings conducted at the university provide an opportunity to get acquainted with entrepreneurial experience and acquire skills and competencies for the development of entrepreneurial thinking. The University provides a range of learning opportunities that foster innovative teaching and learning. The University conducts a number of activities aimed at stimulating the use of various innovative approaches in teaching. In recent years, a number of specific measures have been implemented in the country to improve the education system, for example, a concept was approved providing for the introduction of innovative and advanced and international educational standards into the educational and pedagogical process, increasing entrepreneurial skills and entrepreneurial thinking.

The concept for the development of the higher education system of the Republic of Uzbekistan until 2030 provides for:

- development of public-private partnerships in the field of higher education, increasing the level of coverage in higher education by more than 50 percent on the basis of organizing state and non-state higher educational institutions in the regions of operation, creating a healthy competitive environment in the field;
- ensuring the formation of the National University of Uzbekistan and Samarkand State University as flagships of the country's higher educational institutions;
- gradual transfer of the educational process of higher educational institutions to a credit-modular system;
- introduction of advanced standards of higher education, in particular, a gradual transition from education, whose curricula are aimed at obtaining theoretical knowledge, to an education system aimed at developing practical skills based on international experience;
- raising the content of higher education to a qualitatively new level, establishing a system for training highly qualified personnel who can find their place in the labor market, make a worthy contribution to the stable development of the social sphere and sectors of the economy;
- ensuring the academic independence of higher educational institutions;
- phased implementation of the concept "University 3.0", which provides for the interconnection of activities to commercialize the results of education, science, innovation and research in higher educational institutions;
- creation of technoparks, foresight centers, transfer technology centers, start-ups and accelerators in higher educational institutions by attracting foreign investments, expanding the scale of paid services and other extra-budgetary funds, bringing them to the level of scientific and practical institutions for forecasting and researching socio-economic development relevant industries, spheres and regions;
- ensuring the publication of articles by professors-teachers, scientific applicants, doctoral students, undergraduate and graduate students of higher educational institutions in reputable international scientific journals with a high impact factor, increasing the citation rates of articles, as well as the gradual inclusion

of republican scientific journals in the international scientific and technical data base;

- establishing mutually beneficial cooperation in education with manufacturing enterprises and research institutes;
- increasing the level of enrollment in higher education for the strata of the population in need of social protection, including persons with disabilities, with an improvement in the infrastructural conditions for them.

In particular, our university, according to the report D 1.2 for “Entrepreneurial Teaching and Learning”, is taking the following measures:

1. Make changes to curricula to develop entrepreneurial thinking and skills through the use of case studies;
2. Organization of field training at the leading enterprises of the industry;
3. Provide access to resources that can inspire new ideas from other HEIs through networking and exchange of best practices;
4. Involvement of students in competitions of business ideas / plans as part of their additional education;
5. Coordination and integration of entrepreneurial activities of the University.

3.2. Dimension “Preparing and Supporting Entrepreneurs”

According to the parameter "Training and support of entrepreneurs" gave 4.2 point result according to the report. Entrepreneurship is one of the important drivers of economic development, increasing employment and incomes of the population. In order to support the subjects of this sphere in recent years, more than 50 decrees and resolutions of the President of the Republic of Uzbekistan have been adopted.

The President of the Republic of Uzbekistan, in a decree dated February 5, 2019 No.PP-4160 "On additional measures to improve the rating of the Republic of Uzbekistan, in the annual report of the WB and the International Financial Corporation (IFC)" Doing Business "set a goal to reach 20th place by 2022.

In our republic, the following conditions have been created for business development:

1. The time for registering a small business is 30 minutes. To register a subject, as an individual entrepreneur, it is required to prepare only one document, and as a small enterprise with a legal entity - two documents;
2. Financial support for small businesses is carried out as follows:
3. The interests of business are protected by the institution of the Commissioner for the protection of the rights and legitimate interests of business entities. In Uzbekistan, unscheduled inspections of small business activities have been canceled, business entities are exempted from all types of responsibility that have committed financial and economic offenses for the first time;
4. In TSTU training courses have been organized for entrepreneurs on doing business, implementing projects on the basis of privatized facilities.

According to the parameter "Training and support of entrepreneurs", our university also conducts a number of events:

1. Organize incentives for ideas and start-ups;
2. Allocation of funds on the basis of business contracts for the introduction of production or the provision of services at faculties;
3. Encouragement of initiatives that stimulate entrepreneurial potential;
4. Placement of our own laboratories or production units on campus;
5. Implementation of our own developments in foreign markets in order to stimulate entrepreneurial and innovative activities.

4. In-depth survey (employers, alumni)

As part of WP2 the university conducted a survey among employers and graduates to identify labour market qualification requirements and possible skills mismatches for graduates in the field of entrepreneurial skills.

In this chapter, results from the online survey of employers and alumni are presented. The rationale of the survey was to identify the skills gaps in terms of skills needed and the actual skills state of university graduates as perceived by companies and alumni.

The survey was conducted in May and June 2021. Each TRIGGER partner in Kazakhstan, Uzbekistan and Tajikistan distributed the same questionnaire independently in order to gain comparable data. The questionnaire was developed based on the Entrepreneurship Competence Framework⁴ and other studies on entrepreneurship.⁵

In total, the questionnaire comprised 130 items on three EntreComp dimensions „Ideas“, „Resources“ and „Actions“ and in four dimensions on „Digital Skills“, „Financial Skills“, „Marketing Skills“ and „Skills in Innovation Management“, plus 8 questions on demographic variables, such as position of the survey participant in the company, company size, and sector of company/professional activity. All items were presented with a five-point Likert scale anchored with 1 = not at all important to 5 = very important.

4.1. Dimension „Ideas“

Table 1: Dimension "IDEAS"	Employer							Alumni						
	Importance			Graduate level			I ± GL	Importance			Graduate level			I ± GL
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
Items														
Identifying, creating and seizing opportunities.	24	3,8	1,1	24	3,8	1,0	0,0	20	3,5	1,0	20	3,0	1,2	-0,5

⁴ Bacigalupo M., Kampylis P., Punie Y. and Van Den Brande L. (2016) EntreComp: The Entrepreneurship Competence Framework. Luxembourg (Luxembourg): Publications Office of the European Union; Online: <https://publications.jrc.ec.europa.eu/repository/handle/JRC101581> (accessed 2021-02-02).

⁵ The dimension on „Digital Skills“ was developed from Carretero, S. / Vuorikari, R. / Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use, doi:10.2760/38842; the further dimensions were built on Loué, C. & Baronet, J. (2012) Toward a new entrepreneurial skills and competencies framework: a qualitative and quantitative study. In: International Journal of Entrepreneurship and Small Business, Vol. 17, No. 4, pp. 455-477.

Uncovering the needs of customers and other stakeholders.	24	4,3	0,7	24	4,0	1,0	-0,3	20	3,7	1,0	20	3,2	0,9	-0,5
Analysing the contexts where value can be created.	24	4,1	0,6	24	3,9	1,2	-0,2	20	3,6	0,9	20	3,1	1,1	-0,5
Developing ideas and opportunities to create value.	24	4,2	0,9	24	3,8	1,1	-0,4	20	4,0	1,0	20	3,0	0,9	-1,0
Developing better solutions to existing and new challenges.	24	4,4	0,8	24	4,0	1,1	-0,4	20	3,9	1,1	20	3,5	1,1	-0,4
Exploring and experiment with innovative approaches.	24	4,3	0,7	24	3,9	1,0	-0,4	20	4,1	0,8	20	3,8	0,9	-0,3
Developing a vision to turn ideas into action.	24	4,6	0,7	24	3,9	1,0	-0,7	20	3,4	0,9	20	3,2	1,0	-0,2
Judging what value is in social, cultural and economic terms.	24	4,1	0,9	24	4,0	0,9	0,0	20	3,4	0,8	20	3,2	1,1	-0,3
Recognising the potential an idea has for creating value.	24	4,2	0,9	24	4,0	0,9	-0,2	20	3,4	0,7	20	3,3	1,0	-0,1
Identifying suitable ways of making the most out new ideas.	24	4,2	0,7	24	3,8	1,1	-0,4	20	3,6	1,0	20	3,2	1,1	-0,4
Assessing the consequences of ideas that bring value on the target community, the market, society and the environment.	24	4,3	0,8	24	3,8	1,0	-0,5	20	3,7	0,7	20	3,1	1,1	-0,6
Reflecting on how sustainable long-term social, cultural and economic goals are.	24	4,1	0,9	24	3,9	1,1	-0,3	20	3,5	0,9	20	3,2	1,1	-0,3
Acting responsible.	24	4,6	0,7	24	4,0	1,1	-0,6	20	4,0	0,9	20	3,6	1,0	-0,4

Employers, in accordance with the importance of the tactical level of qualifications of graduates, determine the difference by several indicators, such as: "Developing a vision to turn ideas into action" and "Acting responsible". In particular, the difference between "importance" and "graduate level". The difference are -0.7 and -0.6.

According to graduates, according to the actual level of qualifications of graduates, they also identify differences in several indicators, such as: "Developing ideas and opportunities to create value" and "Assessing the consequences of ideas that bring value on the target community, the market, society and the environment". The difference are -1.0 and -0.6.

By comparison, for employer there is a similarity between importance and graduate level in "Mean" row for the ideas "Identifying suitable ways of make the most out new ideas", however, in "SD" distinguish indicators between 1.1 and 1.0, respectively.

Employers and graduates of the program “Developing better solutions to existing and new challenges”, “Identifying suitable ways of making the most out new ideas” (-0.4) and also “Reflecting on how sustainable long-term social, cultural and economic goals are” (-0.3) in accordance with the employer ratings "importance" and "graduate level".

4.2. Dimension “Resources”

Table 2: Dimension "Resources"				Employer				Alumni						
	Importance			Graduate level			I ± GL	Importance			Graduate level			I ± GL
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
Items														
Reflecting on your needs, aspirations and wants in the short, medium and long term.	24	3,7	1,0	24	3,9	1,0	0,2	20	3,5	1,1	20	3,0	1,1	-0,5
Identifying and assess one's own individual and group strengths and weaknesses.	24	4,2	0,9	24	3,8	0,8	-0,4	20	3,7	0,7	20	3,2	0,9	-0,5
Believing in one's own ability to influence the course of events, despite uncertainty, setbacks and temporary failures.	24	4,1	0,8	24	4,1	1,0	0,0	20	3,6	1,2	20	3,5	0,8	-0,1
Being determined to turn ideas into action and satisfy one's own need to achieve.	24	4,3	0,7	24	3,9	1,1	-0,4	20	3,9	0,9	20	3,4	0,9	-0,5
Being prepared to be patient and keep trying to achieve long-term individual or group aims.	24	4,2	0,9	24	3,9	0,9	-0,3	20	3,8	0,8	20	3,1	1,0	-0,7
Being resilient under pressure, adversity, and temporary failure.	24	4,3	0,8	24	3,8	1,1	-0,5	20	3,7	1,0	20	3,5	0,8	-0,2
Getting and managing the material, non-material and digital resources needed to turn ideas into action.	24	4,3	0,9	24	4,2	0,9	-0,1	20	3,6	1,0	20	3,6	0,9	0,0
Making the most of limited resources.	24	4,3	0,9	24	3,8	1,0	-0,5	20	3,7	0,9	20	3,3	1,0	-0,4
Getting and managing the competences needed at any stage, including technical, legal, tax and digital competences through suitable partnerships, networking, outsourcing and crowd-sourcing.	24	4,2	0,9	24	3,9	1,2	-0,3	20	3,3	1,0	20	3,1	1,1	-0,2

Estimating the cost of turning an idea into a value-creating activity.	24	4,2	0,8	24	4,1	0,9	-0,1	20	3,7	0,9	20	3,5	1,0	-0,2
Planning, putting in place and evaluating financial decisions over time.	24	4,4	0,7	24	4,1	1,1	-0,3	20	3,7	1,0	20	3,5	1,1	-0,2
Managing financing to make sure my value-creating activity can last over the long term.	24	4,6	0,6	24	4,0	1,1	-0,6	20	3,6	0,8	20	3,2	1,1	-0,4
Inspiring and enthusing relevant stakeholders.	24	4,1	1,1	24	3,9	1,0	-0,2	20	3,7	1,0	20	3,5	1,2	-0,2
Getting the support needed to achieve valuable outcomes.	24	4,3	0,7	24	4,1	0,8	-0,2	20	4	0,9	20	3,3	0,8	-0,7
Demonstrating effective communication, persuasion and negotiation.	24	4,1	0,8	24	3,9	1	-0,2	20	3,9	0,8	20	3,5	1	-0,4
Demonstrating effective leadership.	24	4,1	0,8	24	3,9	0,9	-0,2	20	3,7	0,9	20	3,7	0,9	0,0

Moving on to Table 2, the indicators according to (employers in) managing financing to make sure my value-creating activity can last over the long term have big differences between importance and graduate levels for employer that equals to -0.6. According to graduates, the indicators (such as) in "Being prepared to be patient and keep trying to achieve long-term individual or group aims" also have highest differences between of "importance" and "graduate level" that is -0.7). are grad same as -0.7.

According to employers of "importance" "graduate level" there are similarities between the indicators of employers and graduates on such an indicator as: "believing in their ability to influence the course of events, despite uncertainty, failures and temporary failures"". According to graduates of "importance" "graduate level" there are similarities between the indicators of employers and graduates on such an indicator as: "preparation and management of tangible, intangible and digital resources necessary to turn ideas into actions."

Ranking of employers and graduates in the category of "importance" there is also a difference in the indicator as: "Obtaining and managing competencies necessary at any stage, including technical, legal, tax and digital competencies, through suitable partnerships, networking, outsourcing and crowdsourcing" 4.2 and 3.3.

4.3. Dimension “Actions”

Table 3: Dimension "Actions"	Employer							Alumni						
	Importance			Graduate level			I ± GL	Importance			Graduate level			I ± GL
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	

In this table, there are several differences in the indicator "Actions" according to employers, in accordance

with the actual level of qualification of graduates, the difference in indicators is revealed: "Determining priorities and action plans", "Testing ideas and prototypes from early stages to reduce the risks of failure", "Establishing links with others to organize the skills and experience necessary to achieve goals" and "Conflict resolution and a positive attitude to competition when necessary". In particular, the differences between "importance" and "graduate level" it is -0.6. But according to graduates, there is no such sharp difference.

According to employers and graduates "importance" "graduate level" there are similarities which is -0.3, according to the indicator as: "Decision-making when the result of this decision is uncertain, when the available information is incomplete or ambiguous, or when there is a risk of unintended results"

There is also a difference between the views of employers and graduates on such indicators as: "the Definition of priorities and action plans" (and -0,6 -0,1), "Interaction with other organizations for skills and experience needed to achieve goals" (down 0.6 and -0.2) and "conflict Resolution and positive attitude towards competition when necessary" (and -0,6 -0,2).

According to graduates "the installation of long-, medium - and short-term goals and test ideas and prototypes from the early stages to reduce the risk, not" are "important" (3.9 and 3.8 respectively).

4.4. Dimension "Digital Skills"

Table 4 Dimension "Digital skills"	Employer							Alumni						
	Importance			Graduate level			I ± GL	Importance			Graduate level			I ± GL
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
Items														
Using data and information from digital environments to assess the potential of ideas.	24	4,2	1,1	24	3,9	1,0	-0,3	0	3,3	0,8	20	2,9	0,9	-0,4
Deploying digital media, apps or web-based tools for marketing.	24	4,3	0,9	24	4,0	0,8	-0,3	20	3,8	0,8	20	3,5	0,9	-0,3
Using knowledge on automation and artificial intelligence for improving products, processes and services.	24	4,5	0,9	24	3,7	1,0	-0,8	20	3,9	0,7	20	3,4	1,2	-0,5
Understanding and using information from the web and other digital sources to identify customer needs.	24	4,5	0,8	24	3,9	0,9	-0,6	20	3,4	0,9	20	3,5	1,1	0,1
Using software apps and digital tools for managing collaboration with teams and partners.	24	4,4	0,7	24	4,1	0,8	-0,3	20	3,7	1,0	20	3,5	1,1	-0,2

Analyzing Table 4.4 on the indicator "Measurement of Digital Skills", there are also several differences in

the opinion of employers, in accordance with the actual level of qualification of graduates on such indicators as: "Using knowledge on automation and artificial intelligence to improve products, processes and services" and "Understanding and using information from the Internet and other digital sources to determine customer needs". In particular, the differences between "importance" and "graduate level" is -0.8 and -0.6

According to graduates, such differences can only be seen in the indicator "The use of knowledge on automation and artificial intelligence to improve products, processes and services", which is also in the opinion of the employer.

According to employers "importance" "graduate level" there are similarities, which is -0.3, in terms of: "using data and information from digital environments to assess the potential of ideas", "deploying digital media, applications and web tools for marketing" and "using software applications and digital tools to manage collaboration with teams and partners".

The indicator "Understanding and using information from the Internet and other digital sources to determine customer needs" (0.1) is also "important" according to graduates.

There is also a difference between the opinions of employers and graduates on such indicators as: "The use of knowledge on automation and artificial intelligence to improve products, processes and services" (-0.6 and -0.1), "Interaction with others to organize skills and knowledge necessary to achieve goals" (-0.8 and -0.5).

4.5. Dimension "Financial Skills"

Table 5 Dimension "Financial skills"	Employer							Alumni						
	Importance			Graduate level			I ± GL	Importance			Graduate level			I ± GL
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
Items														
Knowing how to read and analyse a balance sheet.	24	4,2	0,9	24	3,9	1,0	-0,3	0	3,1	0,9	20	2,9	1,1	-0,2
Drawing conclusions and deriving potential courses of action from balance sheets.	24	4,3	0,8	24	3,9	1,0	-0,4	20	3,3	1,1	20	3,2	1,1	-0,1
Managing cash flow.	24	4,3	0,9	24	3,8	1,1	-0,5	20	3,6	1,1	20	3,4	1,0	-0,2
Identifying and meeting the organization's financial needs in the short and long term	24	4,3	0,8	24	3,7	1,1	-0,6	20	3,7	1,0	20	3,2	1,1	-0,5
Calculating costs, cost prices, and margins.	24	4,7	0,6	24	3,7	1,4	-1,0	20	3,6	1,1	20	3,2	1,1	-0,4

Analysis of Table 4.5 on the indicator Dimension "Financial skills" there are also several differences in the opinion of employers and graduates, in accordance with the actual level of qualification of graduates on such indicators as: "Identifying and meeting the organization's financial needs in the short and long term" and "Calculating costs, cost prices, and margins". In particular, the differences between "importance" and "graduate level" are -0.6 and -1.0

According to employers "importance" and "graduate level" there are some similarities, which in there are the some indicators in "Knowing how to read and analyze a balance sheet" that is 0,3. The indicator "Understanding and using information from the web and other digital sources to identify customer needs" (0.1) is also "important" according to graduates of "Drawing conclusions and deriving potential courses of action from balance sheets" has similarities of -0.1.

In addition, employers consider the indicator, which is "Calculating costs, cost prices, and margins", equals to 4.7 and according to graduates, such an indicator as "Identifying and meeting the organization's financial needs in the short and long term", which is 3.7.

4.6. Dimension "Marketing"

Table 6 Dimension "MARKETING"	Employer							Alumni						
	Importance			Graduate level			I ± GL	Importance			Graduate level			I ± GL
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
Items														
Deploying sales arguments with a view to persuading clients to buy.	24	4,0	1,1	24	3,9	1,0	-0,1	0	2,9	0,9	20	3,1	1,2	0,2
Negotiating while using specific techniques	24	4,4	0,8	24	3,9	0,9	-0,5	20	3,7	1,0	20	3,2	0,8	-0,5
Developing commercial strategies and means whereby to attract new clients	24	4,6	0,8	24	3,8	1,0	-0,8	20	3,8	1,1	20	3,7	1,0	-0,1
Using specific techniques to encourage client loyalty.	24	4,0	1,1	24	3,8	1,2	-0,2	20	3,1	1,1	20	3,3	0,7	0,2
Creating a positive image of the firm, promoting an ethical image of the firm.	24	4,4	0,8	24	3,9	0,9	-0,5	20	3,5	1,4	20	3,7	0,9	0,2
Building relationships of trust with clients and partners.	24	4,6	0,6	24	4,2	0,8	-0,4	20	4,1	0,8	20	4	1	-0,1

Analysis of Table 4.6 on the indicator "Marketing " by the employers there are differences between

"importance" and "graduate level" on the indicator as: "Developing commercial strategies and means wherever to attract new clients ". In particular, the differences between "importance" and "graduate level" is -0.8.

Furthermore, the difference between "importance" and "graduate level" for graduates in "Negotiating while using specific techniques" is -0.5.

In addition, the opinion of employers and graduates has some similarities between "importance" and "graduate level" such as: "Deploying sales arguments with a view to persuading clients to buy" (-0.1) and "Developing commercial strategies and means whereby to attract new clients" and "Building relationships of trust with clients and partners" which is -0.1.

In general, opinions about the criterion "Marketing" of employers and graduates differ from each other. This is due to the development of the experience of the employer. They believe that studying and capturing the market is important for generating income.

4.7. Dimension "Innovation management"

Table 7 Dimension "Innovation management"	Employer							Alumni						
	Importance			Graduate level			I ± GL	Importance			Graduate level			I ± GL
	N	Mean	SD	N	Mean	SD		N	Mean	SD	N	Mean	SD	
Items														
Developing innovation strategies.	24	3,6	1,1	24	3,7	1,1	0,1	0	3,1	1,0	20	2,8	1,0	-0,3
Analysing the market potentials of ideas and concepts for new products, processes and services.	24	4,2	0,9	24	3,8	1,1	-0,4	20	3,5	0,9	20	3,2	1,1	-0,3
Planning, implementing and controlling innovation processes with project management methods.	24	4,1	0,8	24	3,6	1,1	-0,5	20	3,5	0,9	20	3,4	1,1	-0,1
Selecting and applying methods for exchange of ideas and knowledge in the innovation process.	24	4,2	0,9	24	3,8	1,0	-0,4	20	3,8	1,1	20	3,2	1,2	-0,6
Managing collaboration between customers, suppliers and development partners in the innovation process.	24	4,2	0,9	24	3,8	1,1	-0,4	20	3,5	1,1	20	3,1	1,2	-0,4

In this table, there is no sharp difference in "importance" and "graduate level" on the part of the employers, but the indicator can be noted as: "planning, implementation and control of innovative processes with project management methods" and the difference is -0,5.. In particular, according to graduates, there are differences between "importance" and "graduate level", which is -0.6 according to the indicator "choice and application of methods for the exchange of ideas and knowledge in the innovation process".

The opinion of employers and graduates have some similarities between "importance" and "graduate level" also according to the indicator: "the choice and application of methods for the exchange of ideas and knowledge in the process of innovation." which is 4.2 and 3.8 respectively.

5. Identified gaps and skills mismatches

Table 1: Skills gaps as rated by employers and alumni

Main dimensions of competencies	rated as skills gap by employer and alumni	rated skills gap by employers	rated skills gap by alumni
1. Ideas	<ul style="list-style-type: none"> Developing better solutions to existing and new challenges Identifying suitable ways of making the most out of new ideas Reflecting on how sustainable long-term social, cultural and economic goals are. 	<ul style="list-style-type: none"> Developing a vision to turn ideas into action. Acting responsibly. 	<ul style="list-style-type: none"> Developing ideas and opportunities to create value. Assessing the consequences of ideas that bring value on the target community, the market, society and the environment.
2. Resources	<ul style="list-style-type: none"> Inspiring and enthusing relevant stakeholders. 	<ul style="list-style-type: none"> Managing financing to make sure my value-creating activity can last over the long term. 	<ul style="list-style-type: none"> Being prepared to be patient and keep trying to achieve long-term individual or group aims. Getting the support needed to achieve valuable outcomes.
3. Actions	<ul style="list-style-type: none"> Making decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes. Reflecting and learning from both success and failure (your own and other people's). 	<ul style="list-style-type: none"> Defining priorities and action plans. Testing ideas and prototypes from the early stages to reduce risks of failing. Networking with others to organise skills and expertise needed for goal attainment. Solving conflicts and facing up to competition positively when necessary. 	
4. Digital skills	<ul style="list-style-type: none"> Deploying digital media, apps or web-based tools for marketing. 	<ul style="list-style-type: none"> Using knowledge on automation and artificial intelligence for improving products, processes and services. Understanding and using information from the web and 	<ul style="list-style-type: none">

		other digital sources to identify customer needs.	
5. Financial skills	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Identifying and meeting the organization's financial needs in the short and long term Calculating costs, cost prices, and margins. 	<ul style="list-style-type: none">
6. Marketing	<ul style="list-style-type: none"> Negotiating while using specific techniques Using specific techniques to encourage client loyalty. 	<ul style="list-style-type: none"> Developing commercial strategies and means whereby to attract new clients 	<ul style="list-style-type: none">
7. Innovation Management	<ul style="list-style-type: none"> Managing collaboration between customers, suppliers and development partners in the innovation process. 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Selecting and applying methods for exchange of ideas and knowledge in the innovation process.

Summarizing the results of the tables in section 4, we can come to the following conclusions. Specifically, on the Ideas parameter, a number of categories are rated as a skills gap by employers and graduates. For example, «Developing better solutions to existing and new challenges», «Identifying suitable ways of making the most out of new ideas» and «Reflecting on how sustainable long-term social, cultural and economic goals are."Developing a vision for turning ideas into action." and "Acting responsibly." Is identified as a gap according to employers. Also on the graduate side by category: - "Developing ideas and opportunities to create value." and "Assessing the implications of ideas that bring value to the target community, market, community, and environment." there is a skills gap.

For the Resources parameter, the Inspiration and Enthusiasm of Relevant Stakeholders category is rated as a skills gap by employers and graduates. This shows that to achieve a common goal each party must have a common "point" for the development of any activity, in particular and for entrepreneurship. As the "Inspiration" of the entrepreneur is important for the diversification of products and services. And the enthusiasm of graduates is also considered the most important aspect for self-development.

According to employers today, graduates lack the financial management skills to make sure that their own value-creating activities can be sustained over the long term. The skills gap assessed by graduates shows "Being willing to be patient and keep trying to achieve long-term individual or group goals." and "Getting the support needed to achieve valuable outcomes."

The "Actions" dimension also reveals a skills gap between employer and graduates in the categories "Make decisions when the outcome of that decision is uncertain, when the information available is incomplete or ambiguous, or when there is a risk of unintended consequences." and "Reflect and learn from successes and failures (their own and others')." This is due to the fact that, according to employers, graduates in the course of decision-making actions do not have the concept, experience regarding some certain risks because they do not have enough information and are not prepared to take unforeseen risks.

In addition to the above, employers believe that graduates also lack the ability to set priorities and action plans, to test ideas and prototypes at an early stage in order to reduce the risk of failure, to network with other people to organize the skills and experience needed to achieve the goal, and to resolve conflicts and positively confront competitors when necessary.

The Digital skills parameter also reveals a skills gap between employers and graduates in the category "Deploying digital media, apps or web tools for marketing." This may be due to the rapid development of digital technology. As today's big companies and corporations are digitally connected, the skills of graduates do not meet the requirements of the market. In this parameter, according to employers, there is also a skills gap on the part of graduates, such as: "Using knowledge of automation and artificial intelligence to improve products, processes and services." and "Understanding and using information from the Internet and other digital sources to identify customer needs." This gap is due to the fact that graduates do not have sufficient knowledge in this area.

There is also a skills gap on the "Financial skills" parameter according to employers, such as: "Identifying and meeting the financial needs of the organization in the short and long term" and "Calculating costs, production costs, and margins." This means that it is necessary to make a change in the curriculum and increase the number of credits in cost calculation.

For the Marketing parameter, according to employers and graduates, there are skill gaps such as: "Negotiating while using specific techniques" and

"Using specific techniques to encourage customer loyalty." This is due to the fact that the marketing skills of graduates are not sufficiently developed, because today in many companies it is negotiating at the highest level to solve the problems of attracting investment projects. And the use of specific techniques to encourage customer loyalty solve a large income of these companies. In addition, according to employers, graduates do not have sufficient skills to develop commercial strategies and tools to attract new customers, which is important for the development of strategic plans of companies.

On the Innovation Management parameter, there is a skills gap according to employers and graduates in "Managing collaboration between customers, suppliers, and development partners in the innovation process." According to graduates, there is also a gap on the criterion "- Choosing and applying methods for sharing ideas and knowledge in the innovation process."

6. Conclusions: Steps to further develop entrepreneurship education at the university

Analyzing as a whole, we can say that there are some differences between the views of employers and graduates, that it is necessary to develop measures to reduce these differences.

Since the academic year 2020-2021, the state has allowed each university to make changes in curricula/courses and initiate in the academic activities, although the program of study are governed by the state educational standards, each university has the right to change/update the curricula and courses from 40 to 50%. Because of this, the university administration is also going to change the undergraduate and graduate additional program and add an Innovative Entrepreneurship course beginning in the 2021/2022 academic year.

Currently, in order to reduce the skills gap between employers and graduates, the subject "Business Planning" is taught at the undergraduate level, which contributes to the development of initial entrepreneurial skills. In addition, for the further development of entrepreneurial activity of graduates and increasing the level of knowledge of business, according to the labor market demand from employers and at the suggestion of heads of departments changes in the work programs, which was approved by the Vice-Rector for Academic Affairs a number of subjects: "Innovative Entrepreneurship", "World Economy and International Business", "Digital business - projects and innovation" and the proposed center for the improvement of tariff policy "Development and Planning Center. In turn, the course "Innovative Entrepreneurship" allows for the development of better solutions to existing and new problems, identifying appropriate ways to maximize the benefits of new ideas and thinking about how sustainable long-term social, cultural and economic goals. The World Economics and International Business course helps to identify the international financial needs of an organization in the short and long term and to reduce the cost of costs and increase enterprise margins. In turn, the Digital Business - Projects and Innovation course helps narrow the gap between employers and graduates in deploying digital media, apps or web tools for marketing, using knowledge of automation and artificial intelligence to improve products, processes and services, understanding and using information from the Internet and other digital sources to identify customer needs.

In addition to the above, in order to eliminate the large differences between employers and graduates, the university plans to introduce a number of measures, such as:

- to hold meetings and debates (with case studies on real business problems) with students who are in business,
- according to the state policy which is conducted several years in a row to support entrepreneurial activity in the Republic of Uzbekistan, the University administration also supports the opening of businesses and Start-ups.

It should also be noted that after participating in the TREGGER project, the management of our university

is considering introducing the subject "Innovative Entrepreneurship" into the curriculum for engineering majors.

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