

DEVELOPMENT OF ENTREPRENEURIAL EDUCATION IN UKRAINIAN UNIVERSITIES

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ABSTRACT. *The purpose of the paper is to investigate accelerators as a new element of interaction between universities, business and state. This process can be used for improving entrepreneurial education, which increases the innovation potential of universities. The study uses methods of analysis and synthesis, systematic approach, method of classification, method of comparison and method of measurement. The need for massive changes in higher education is proved. Also, increased attention to entrepreneurial education and involvement of business representatives community in educational process is needed. This proposed accelerator is the most perspective cooperation instrument between business, universities and state itself. Mainly it can be used in the process of entrepreneurial education improvement and innovative potential development. Different types of accelerators under the concept of "creation initiator" are considered. The examples of such accelerators worldwide and in Ukraine are investigated. It is proved that the most attractive option would be to create an accelerator on the basis of a university. That would combine financial, production, intellectual and other capabilities of several large companies with the innovative potential of the university. All participants will receive positive results. It was found that the distinctive feature of a university accelerator lies not only in its business orientation, but also focuses on the development of teaching and training materials, which can be scaled to accelerators in other universities.*

KEYWORDS: *entrepreneurial education, accelerator, development of entrepreneurship, universities of Ukraine, innovation potential*

JEL CLASSIFICATION: *O32, O36, I23, L53*

INTRODUCTION

The innovative type of economic development is now a worldwide trend. There is a total globalisation in almost all sectors of economy. As a result of the ever-increasing pace of innovative changes in management, technology and engineering, significant qualitative changes take place in the labour market: new professions appear, requirements for university graduates change, competences are prioritised, etc. As a result, the higher education system is gradually undergoing transformation.

Today, basic entrepreneurial competences and the ability to work on innovative projects are necessary for university graduates. Both educational programmes and mechanisms of interaction between universities, state and business require revision.

The impact of higher education on the development of innovative entrepreneurship is crucial. In universities, a large number of potential innovators are concentrated among students and teachers. Universities are the basic element of a country's innovation ecosystem. The ecosystem determines the development of entrepreneurial environment and the speed of its adaptation to the dynamic conditions of external and internal environment (Cai, Y., Chen, J. Ma, Higher, Q., 2020). This is a characteristic of developed economies (Ritala, P., Agouridas, V., Assimakopoulos, D., Gies, O., 2013), developing economies (Urban, B., 2013), as well as economies in underdeveloped regions (Stephens, H. & Partridge, M., 2013).

There is also a point of view that classical entrepreneurial education does not only have a positive impact. The paper (Lorz, M., Mueller, S., Volery, T., 2013) points out that previous studies of entrepreneurial education are rather one-sided and do not always consider current trends in the business environment. The authors analysed the dependence of business success on the content of entrepreneurial education of its founders. They proved that it is necessary to change the existing teaching methods and to direct more efforts in entrepreneurial education to the growth of awareness in innovation and venture capital financing.

In teaching, there is an increasing emphasis on mentoring and coaching young innovators by experienced entrepreneurs. This is most evident in accelerators. The choice of mentors should be made carefully, considering not only their professional, but also personal characteristics as mentors. It has a significant impact on the outcome of their cooperation with startups (Kuratko, D.F., Neubert, E., Marvel, M.R., 2021).

The methods and mechanisms for innovation during the pandemic have changed considerably (Gopalakrishnan, S. & Kovoor-Misra, S., 2021). This is reflected in a shift in the focus of innovation towards health care. At the same time, the entrepreneurial environment has been heavily influenced by total digitalization, which was reinvigorated during the pandemic and has opened up a great range of remote working opportunities (Newman, D., 2020). Labour market, which is already highly oriented on remote work, has changed significantly after the lockdowns. The higher education system has also changed. It has been enriched with a significant number of new tools for distance learning and remote teamwork on various projects, including innovative ones.

The time has come for fundamental changes in higher education and in the approach to teaching and delivering entrepreneurial competencies. In particular, more attention should be focused on solving real practical tasks. Teamwork methods should be introduced as much as possible, and business practitioners should be involved in the teaching process (Iglesias-Sánchez, P., Jambrino-Maldonado, C., Heras-Pedrosa, C., 2019). These changes are possible only with a competent state policy in the sphere of education and wide involvement of business structures into the educational process. All this can be done within the accelerator as an integral part of the university ecosystem.

Ukraine has already taken some steps towards building a university innovation ecosystem. The ecosystem is proposed to include education, fundamental and applied sciences, as well as knowledge commercialisation. Today, sufficient attention is paid to the educational component in the structure of the innovation ecosystem (Gontareva, I., Litvinov, O., Hrebennyk, N., Nebaba, N., Litvinova V., Chimshir, A., 2022). Science parks have been established and are functioning in universities, new educational programmes are being developed. But now it is necessary to intensify the processes in the system of knowledge commercialization. This can be done primarily by attracting private business to the educational process and innovation ecosystem of universities.

All these factors make it necessary to review the roles of all participants of educational process as well as stakeholders of higher education. The cooperation in the triangle “business – university – state” should be built differently, using new forms of cooperation, which have proven themselves in enhancing innovation and development of entrepreneurial education in the world.

The purpose of the paper is to study accelerators as a new element of interaction between universities, business and government in the process of improving entrepreneurial education. This is necessary to increase the use of innovation potential of universities.

BODY OF PAPER

1 The study materials and methods

The object of the study is accelerators as main points of innovation activity and examples of cooperation between universities, business and the state in the process of training specialists for today's entrepreneurial environment.

The study used methods of analysis and synthesis (investigation of individual components of acceleration programmes in different accelerators), systematic approach (interconnection of different participants of the innovation ecosystem), classification method (grouping accelerators by funding sources and initiators of creation), comparison method (comparing functions, services and work results of different accelerators), measurement method (determination of numerical parameters of accelerator performance in different countries, regions, areas etc.).

2 Results

2.1 Concept and classification of accelerators

Acceleration programmes can be developed and implemented to increase the use of innovative potential in the academic environment, enhance technology transfer and improve the commercialisation of knowledge. These programmes can be embedded in a country's higher education system.

Accelerator is usually understood as an organisation offering short-term training programmes (3 to 6 months) of intensive start-up development with the following services:

- the use of office (sometimes laboratory) infrastructure;
- mentoring by practitioners during the training programme;
- expert support from experts in certain areas (finance, marketing and advertising, IT, law, team-building, etc.)
- information support when entering the market;
- attracting investors at the early stages of a start-up – venture financing.

The world's first accelerator appeared in 2005 – Y Combinator. The result of its work is the well-known companies Airbnb, Dropbox. According to the International Association for Business Innovation (2022), there are about 7000 business incubators and accelerators in the world now. More than 90% of them are non-profit and focus on solving economic development programmes for communities or individual industries. In Ukraine, according to various estimates, between 30 and 40 accelerators are in operation (Yarmak, O., 2022).

The specific features of “business-university-state” cooperation in different accelerators of the world were investigated. It helped to maximise the potential of acceleration programmes in higher education. For the study, it was proposed to classify all accelerators according to the “initiator of creation”.

An accelerator can be initiated by:

1) private capital. The following accelerators can be distinguished in this group:

- private accelerator;
- corporate accelerator;

2) government. The following accelerators can be distinguished in this group:

- public accelerator;
- public-private accelerator;
- an innovation structural unit in state-owned organisations.

The distribution by source of funding is as follows: 6% public, 36% private-public, 58% private sources (2022).

Each format of cooperation has its own characteristics and results. Let us present the most indicative characteristics and consider typical representatives of each group.

2.2 Accelerators initiated by private capital

2.2.1 Private accelerators

A special feature of private accelerators is their profit-oriented focus. Representatives of this group show the best results of their work. The success rate of start-ups is the highest. Individual investors and private venture capital funds invest in such accelerators. Funding is done through a

share in the capital of the future start-up. There are universal accelerators that train and fund start-ups from different industries, and there are specialised accelerators that focus on specific business areas.

The most famous private accelerator is Y Combinator (the USA). The analysis showed that most start-ups have no entrepreneurial experience and usually make the same mistakes. This is where the problem of entrepreneurial deficit of knowledge, which was not acquired during university studies, was clearly traced. Therefore, the accelerator had to correct this mistake by developing additional training courses on basic entrepreneurial knowledge.

Today, participation in Y Combinator's acceleration programme helps avoid the usual problems associated with legal, accounting, management, marketing and other business issues. Also, Y Combinator provides advice on registering intellectual property and securing copyright, which is very important in innovative entrepreneurship. The accelerator has no explicit specialisation, which means that start-ups from different areas of business can take part in the programme.

Y Combinator offers the opportunity to participate in several rounds of investment. Companies from all over the world can act as investors. Since its inception, they have invested more than \$400 billion in more than 3,000 companies. In its early years, about 60 start-ups went through acceleration programmes every year; in recent years, the figure has exceeded 250 start-ups. The percentage of start-ups that have at least returned the money invested is around 80% (2022).

The representative of this group of accelerators in Ukraine is GrowthUP (Ukraine). This is a Ukrainian business accelerator which works with early-stage technology start-ups. The main focus of the acceleration programme is to help start-ups to build and develop their businesses, attract first-time users and test key hypotheses. GrowthUP invests in B2B/B2C Internet projects, which goal is the global market. These projects are normally at the pre-seed or seed stage of development.

Happy Farm Business Accelerator (Ukraine) offers business development services for start-ups and provides further support and investment. It receives a 15% share for participating in the creation of the business. What sets this accelerator apart is its education block. As part of the acceleration programme, participants also receive training, mentor support and access to a full range of services: legal, financial, HR support, infrastructure, etc.

The involvement of universities in this case is possible in terms of engaging teachers with their rich experience of research and teaching as mentors. But the severed links between business and academia limit communication. Therefore, we observe:

- low awareness of accelerator opportunities among university students and professors;
- shortage of mentors among businesspeople due to their heavy workload in their main place of work;
- poor utilization of the potential of university professors.

All of these need to be addressed through cooperation between universities and the business community in tackling common challenges, which include the need to increase innovation activity in the country.

2.2.2 Corporate accelerators

Their purpose is to solve a specific business problem: expanding the product range, new production technology, finding new types of raw materials, etc. These accelerators are a new, advanced form of innovation units of large companies. They are highly specialised and geared towards a single company. An example is Mastercard Start Path (Ireland), which is Mastercard's global start-up accelerator programme that helps expand late-stage innovative start-ups. Technology focus lies in e-commerce, retail, cybersecurity, fintech, healthcare, smart cities, blockchain, AR/VR, voice and big data. The result is the development of more than 260 projects and the raising of more than \$3.5 billion.

Such accelerators are not known in Ukraine today because only very large corporations in a stable economy can afford them. Innovative activities are characterised by a high level of risk.

In an unstable economic environment this risk increases dramatically. Therefore, large companies may join their efforts to carry out innovative research.

A solution for such corporations in Ukraine could be the creation of an accelerator on the basis of a specialised university that combines the financial, production, intellectual and other capabilities of several large enterprises with the innovative potential of the university. The result would be an increase in the commercialisation of university knowledge and an increase in the innovation index of corporations, i.e. an increase in their ability to change and meet the challenges of the time.

2.3 Accelerators initiated by the state

2.3.1 State accelerators

Government accelerators most often focus on social issues: poverty reduction, demographic policy, public transport, environmental issues, etc.

An example of such accelerator is the EIT Digital Accelerator (Belgium), created by the European Institute for Technology and Innovation as part of the Horizon 2020 programme and designed to scale European technologies aimed at international growth (2022). The accelerator offers access to funding and access to market support according to the business needs of a particular start-up.

It currently operates a pan-European network of 16 innovation centres where students, researchers, engineers, business developers and entrepreneurs physically come together to create a digital future. More than 250 start-ups have benefited from this accelerator's training programmes and more than \$20 million has been raised (2020).

The EIT Digital Accelerator aims to have a global impact through European innovation, powered by entrepreneurial talent and digital technology, for which it focuses on developing an innovation ecosystem. There are no such accelerators in Ukraine. But there is the state-owned Ukrainian Startup Fund, which provides grants to startups to undergo acceleration programmes in some Ukrainian accelerators.

2.3.2 Private-state accelerators

In certain cases, general public-private accelerators are created to support private initiatives and priorities for states and individual regions, as well as to develop state-critical business sectors. An example is Basque Open Innovation Platform – BIND 4.0 (Spain) – an accelerator covering more than 65 industry leaders acting as venture capital clients, offering contracts to start-ups for real Industry 4.0 projects. They offer highly efficient start-up acceleration through joint Industry 4.0 projects. The projects are implemented in real environments with leaders in the Basque industrial ecosystem acting as corporate venture capital clients. The result is the development of more than 240 projects and the raising of more than €7 million.

In Ukraine, an example of this type of accelerator is 1991 Data Incubator, a project created by the non-profit organisation SocialBoost under the support of international donors, governmental organisations and business. In 2012, SocialBoost started as a series of hackathons for IT volunteers and for everyone who cares about Ukraine. Digital services based on public data were created. During the first three years of its existence, we held 10 national hackathons and a number of regional events. More than 1,000 people joined SocialBoost. They generated 800 ideas, of which more than 20 projects received funding.

2.3.3 Innovative structural unit in state organisations

Some scholars suggest distinguishing a quasi-form of accelerator functioning as a unit in public sector organisations (Henry, N., Holden, A., Eggers, W. D., 2019). Examples of such units in different organisations around the world have been studied. It should be noted that the activities and functions of such units differ a lot from classical private sector accelerators or from conventional accelerators partially financed by the public sector. This is primarily due to the high-risk participation restrictions that are a typical feature of any innovative project.

The authors of the paper (Vanderhoven, E., Steiner, A., Teasdale, S., Calò, F., 2020) conducted extensive research and concluded that planners of public economic programmes should involve private investors as much as possible in addressing social issues. They note that policy

makers seeking to address persistent social problems through business should consider a comprehensive approach. They should also understand that financial investment does not provide a prompt solution. That is why comprehensive support is needed, including, for example, capacity building.

It is a mistake to delegate social problems solution from state to business. At the same time, in our view, budget funds should not be spent on venture capital financing. The main task of public authorities is to create conditions favourable to attract private investment for venture capital financing.

3 Discussion of results of the research

Universities have considerable innovation potential. Business has a strong demand for innovation activities. University-based accelerators can be established to develop entrepreneurial skills among students and teachers, as well as to enhance technology transfer and commercialization of knowledge.

The aim of a university-based accelerator is to increase the number of successful start-ups and to create entrepreneurial entities based on them. In addition, university accelerators will enhance technology transfer and knowledge commercialization by engaging students, scientists and all stakeholders of a particular region in innovation activities.

The regional factor should not be neglected, as at the end of 2021, 59% of all start-ups, which were accepted to accelerator programmes, are located within 150 kilometres of accelerators (Riley, P., 2021).

The accelerator mechanism should be based on the study of global and domestic experience in the creation and operation of accelerators, taking into account the peculiarities of the Ukrainian university environment.

An example of a university accelerator is Stanford's StartX accelerator, which consists of 1,800 entrepreneurs, experts and full-time university professors. The accelerator has succeeded in attracting investments from more than 700 start-ups. In addition to traditional mentoring, expert support and assistance in attracting investments, participants of the university accelerator receive access to free resources through the StartX partner network where 1,300 founders participate.

In Ukraine, an example of a university accelerator is Polyteco – a company specialised in creating professional software products, formed from the best graduates, postgraduates and talented teachers of one of Europe's largest technical universities – the National Technical University of Ukraine "Kyiv Polytechnic Institute". Accelerator participants are given the opportunity to use the infrastructure, receive expertise and advice, and are provided with assistance in attracting investment.

Today, the most popular fields for start-ups are FinTech, SaaS, data and analytics, healthcare and AI. There is interest in later stages of funding, which confirms the need to develop additional tools to help start-ups in the early stages, for example in a university accelerator.

A specific feature of a university accelerator is the development of training, methodological, legal and other documentation for interaction and cooperation with innovators, mentors, experts, consultants, businessmen, venture capitalists, local governments and other accelerator stakeholders.

Such accelerators offer programmes on preacceleration, acceleration and postacceleration. They include all specifics of educational process in universities, the knowledge and skills of different professions participants and universities, also the possibility of conducting online and offline formats.

An important task of the accelerator is to form a start-up community by attracting innovation-active students, scientists and other innovators, finding and attracting venture funds and business angels. Another major task lies in cooperating with entrepreneurs and local authorities to boost business-oriented innovation activities, technology transfer and successful commercialisation of developments.

CONCLUSIONS

1. Today, many tools have been developed to increase the innovative potential of universities, enhance technology transfer and improve commercialisation of knowledge. One of the most promising tools for Ukraine is accelerators at universities, which will bring entrepreneurial education to a qualitatively new level. This would fully meet the requirements of entrepreneurial environment.

2. Private or corporate accelerators demonstrate the best performance worldwide. Private corporations in Ukraine do not have much resources for innovative activities, but they have high demand for innovative research. Therefore, they can choose to set up an accelerator on the basis of a specialised university which would combine financial, production, intellectual and other opportunities of several large enterprises with the innovative potential of the university. All participants would benefit.

3. The distinctive feature of a university accelerator is its focus not only on business, but also on the development of training and methodological materials that can be scaled to accelerators in other universities.

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