

# Business and Universities in Ukraine: From Network Communication to Practical Implementation

Klynina Tetiana<sup>1</sup>[0000-0002-0334-9852], Sverdlyk Zoriana<sup>2</sup>[0000-0002-2104-0920],

Ruslan Kravets<sup>3</sup> [0000-0003-2837-9190]

<sup>1</sup> National Aviation University, Ukraine

<sup>2</sup> Kyiv National University of Culture and Arts, Ukraine

<sup>3</sup>Lviv Polytechnic National University, Lviv, S. Bandera, 12, 79013, Ukraine

tklynina@gmail.com, zsverdlyk@gmail.com

**Abstract.** The article deals with the main directions of communication interaction Ukrainian universities and business structures, as well as specific achievements of this process. The main directions of cooperation, which are already applied in their practical activity by higher education institutions and business representatives, are highlighted. In particular, this is: assistance to businesses in organization of industrial practice of students; assistance in the organization of dual education on the basis of enterprises; interaction through social partnership; involvement of employers in job fairs and open days organized by universities; sponsorship in conferences, roundtables, forums. Priority ways of further cooperation of business structures and universities of Ukraine are determined, first of all through: creation of scientific centers, laboratories, business incubators; reading introductory lectures business representatives for university students; giving companies the opportunity to participate in discussing and preparing student curricula and plans; development of a system of charitable financial support of universities by business structures. Based on the analysis of the results of sociological surveys, problems have been found in establishing communication links between business and universities, in the employment of graduates, in financing university projects. It is established that the main factor determining the prospects of cooperation between business and universities is the support of this process at the national legislative level.

**Keywords:** Business Structure, University, Fields Of Communication, Job Fair, Sponsorship, Internships.

## 1 Introduction

One of the key tasks for Ukraine today is the development of higher education as a priority and strategic resource of the state, since the state of educational development affects the political, social, economic, cultural status of the country and, most

Copyright © 2020 for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0). COAPSN-2020: International Workshop on Control, Optimisation and Analytical Processing of Social Networks

importantly, the prospects of its functioning. Recently, there has been a clear increase in the dependence of all sectors of the economy on the availability of skilled highly skilled workers, the quality of their work and the introduction of various innovative products they have developed. Higher education is an important factor in the social formation of society, and its improvement is considered a strategic task, because it contributes to the formation of promising directions for the development of all sectors of economy, science and culture. In view of this, strategies are being developed at the state level to improve the system of formation and provision of higher education. It is also important to identify promising forms of cooperation between universities and business, as this will ensure the economic development of the country and will promote the quality and prospect of providing Ukrainian educational services.

The main purpose of the article is to explore the experience of cooperation between business and universities of Ukraine and the main perspective forms of communication between them. The subject of the study was cooperation between Ukrainian universities and business.

### **1.1. Related Research**

It should be noted that a large number of Ukrainian scientists addressed the issue of cooperation between business structures and universities. S. Tarasenko and M. Demchenko touched upon the problems of development of partnership between universities and business in the conditions of constant innovative changes in the world. The authors argue that higher education is one of the most important incentives for innovation, but it is not fully realized due to the lack of partnership between the university and the business sector [20]. Instead, A. Didyk and M. Pogorelov identified in their research the basic theoretical foundations of the organization of cooperation between higher education institutions and business, revealed the content of each concept and gave specific examples [5]. L. Semov addressed the topic of possible borrowing of world practices in cooperation of business, science and education in Ukraine [19]. The researcher thoroughly analyzed the advantages of introducing a competent approach in the education of Ukrainian students and drew attention to the urgent need for such an innovation due to the problem of growing emigration of young intellectual power. Doctor of Science, Professor I. Mazur is also convinced of the need to use foreign experience of cooperation between business and education, because the key task of today is to train specialists of the new type who are able to predict economic changes and respond quickly to them [11]. Social contacts in education, economic advantage of cooperation between universities and companies have been studied by S. Bezwy [2], Y. Dankov [4], Y. Semenets [18] and others. However, only some scholars have touched on the issues of promising forms of relationships in their research, so this issue needs further consideration.

## 2 Means and Forms Business-University Communication

### 2.1 Social network communication

Social networks are an active tool for higher education institutions to position themselves not only in the educational information space, but also to establish contacts with business. Representatives of the latter often monitor the activity of students who are interested in them, and HR managers during recruitment can analyze the pages of universities on social networks in order to "catch" the future candidate for possible indecent behavior or non-compliance with network etiquette in general (especially when it comes to about high-ranking positions). The analysis of the TOP-10 higher education institutions according to the rating of 2019 showed that all universities actively use the most popular social networks in communication today: Some free economic zones have single pages in each social network, and some in one social network have more than a dozen pages of different topics and directions

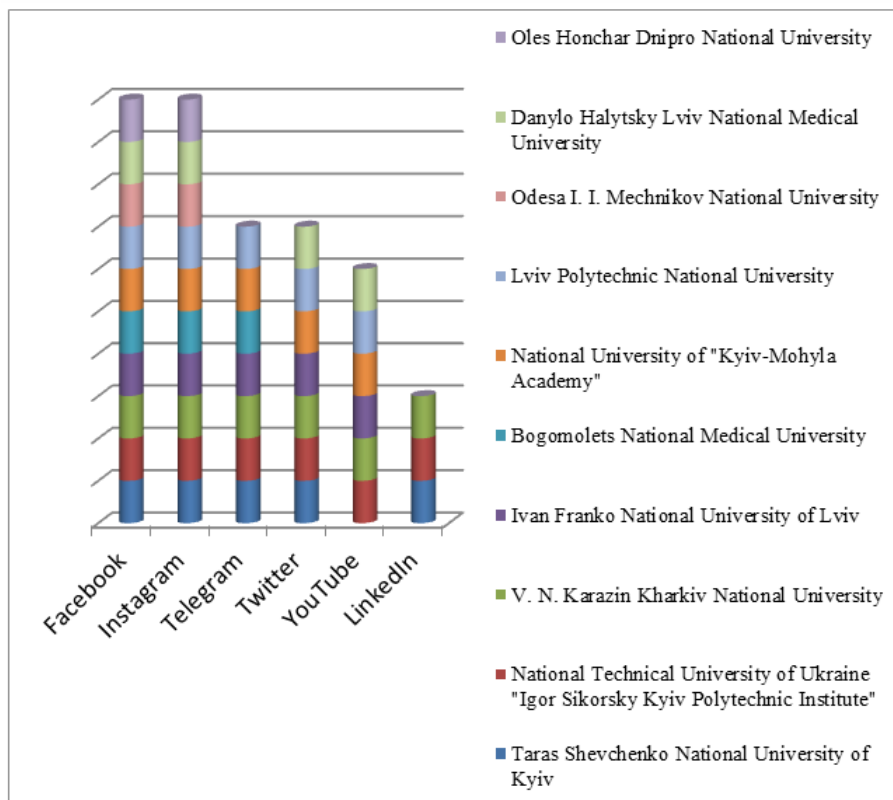


Fig. 1. TOP-10 universities in social networks

Thus, the diagram clearly shows that the most popular social channel of interaction among the free economic zones are the social networks Facebook and Instagram - all the analyzed universities are registered in them. The "golden mean" is occupied by Telegram and Twitter, YouTube has dropped a few positions below. The fewest registered freelance pages were found on the LinkedIn network. Although today LinkedIn is the most powerful network of professional contacts.

## **2.2 Business and university: the need to collaborate**

In today's world of rapid technological change and improvement, it is important for Ukraine to keep track of all innovations and to bring cutting-edge achievements into all walks of life. This is especially true of the education sector as a promising direction for the gradual improvement of competitiveness and modernization of all spheres of public life. However, according to the points of the National Strategy for the Development of Education in Ukraine for 2012 - 2021 [15], significant inconsistencies in the higher education system in our country are the partial mismatch of educational services to the requirements of society, personality requests, labor market needs, and the inefficiency of an effective system. Employment of graduates of higher education institutions, their professional support, and insufficient adaptation of the structure and content of higher education to today's labor market needs. This is confirmed by the results of the polls. Thus, research by the CEDOS think tank found that 59% of students lacked some information about the universities they chose to enter; 22% lacked information on job prospects, 18% lacked internship opportunities, international exchange programs (16%), and information on the content of programs and disciplines (15%). At the same time, nearly a quarter of students (24%) indicated that they had not received the desired information about the demand for the profession in the labor market. However, under any circumstances, 62% of the students surveyed lacked information about the specialty [9].

It is worth noting that not only higher education institutions are interested in establishing cooperation with business structures. A university is a kind of valuable source of knowledge that can also benefit business innovation, which in turn will lead to increased productivity and therefore profit. However, unfortunately, an algorithm for establishing practical communication and interaction has not yet been developed. We propose to pay attention when solving this algorithm on its 4 components:

- Identify necessary strategic needs
- Evaluate and select a business partner or university partner
- Implementation of partnership
- Evaluation, reassessment and change of partnership.

Of course, a good solution in this situation would be to create, at the state level, an information platform, a kind of database of likely business and university partners. Because of the lack of credible information and its limited nature, both parties to the

engagement cannot identify the partners they need, and as a result enter into partnerships with “not the” organizations, which ultimately leads to the termination of the partnership. Another problem is that such cooperation, if it exists, can only be afforded by representatives of big business, narrowing the circle of people involved in the partnership. This is directly explained by the limited internal and material resources of small and medium-sized business representatives who cannot afford to sponsor or invest in the "far-sighted perspective". In this case, assistance would have to come from the state, which, through some subsidies and tax relief, encouraged small and medium-sized businesses to cooperate with universities.

Unfortunately, business and high school representatives identify different obstacles that impede their partnership. Universities believe that the main barriers to cooperation are the lack of awareness of business opportunities for universities. According to entrepreneurs, partnerships do not come out often because of misunderstandings on the one hand, the realities of the business environment and, on the other, because of the bureaucratic nature of higher education institutions [8]. At the same time, in the modern world, very rapidly developing scientific technologies and business structures play a significant role in this process. Universities have quickly realized the benefits of working with business, as the university is at the peak of global economic and educational trends as a training ground for skilled professionals. This, in turn, makes it possible not only to successfully integrate the partner structures in the educational process, but also to continue work on the commercialization of their own developments. Also, the university quite clearly sees the current priorities and requests of companies, according to which forms parts of training programs, courses, practices [21].

### **2.3 Communication tools and means**

The annual National Forum on Business and Universities is being held to provide more detailed coverage of proposals from employers and the ability of universities to meet the existing needs of enterprises in skilled personnel in Ukraine. A key idea of the event is to deepen the business-education partnership. The first forum was held in 2013 and was attended by over 200 representatives of universities, companies, relevant authorities, media, domestic and international experts. The key issues discussed at the meetings were: establishing an effective partnership between business and universities, ways of balancing employers' and universities' expectations regarding training of specialists, development of STEM education for innovative development of Ukraine. Companies and institutions of higher education (SCM, Ukrzaliznytsia, FILM UA GROUP, Girski Mashyny, Portinvest, Kyiv Polytechnic Institution, Taras Shevchenko National University, Priazovsky State Technical University, Dnipropetrovsk National University of Railway Transport, etc.) presented their partnership practices in the field, development of entrepreneurial skills, employment, introduction of online education [7].

The second forum was held in 2014 under the slogan "Transformation of education". Topical topics were discussed during the panel discussions, such as foreign partnership practices of educational institutions and companies, student

business incubators, peculiarities of cooperation between representatives of business and universities in the education of journalists, pharmacists, as well as technical education. A special study conducted by the CSR Development Center from May to July 2014 among students from 30 universities in 10 regions of Ukraine helped to identify factors that influence the formation of a student-friendly employer brand. The results show that there are few affiliate educational programs and activities in the market for a number of specialties (eg chemistry, agricultural, technical specialties other than IT, humanities), on the other hand, the students' passivity is also observed [17].

However, companies that are planning to hire university graduates first need active, persistent, team members. This fact was confirmed by a survey of business structures and job databases. Often, employers pay attention to responsibility, perseverance, the desire to develop, communicativeness of the applicant [25]. Often the skills that are missing (according to the survey are project management, strategic thinking, solving complex problems) [25], are obtained by young workers at the place of work, thanks to the companies conducting trainings, courses, seminars, etc. This, in turn, indicates that Ukrainian universities do not teach students the skills that are business priorities. Therefore, it is important and important to establish new and deepen existing contacts between business structures and higher education institutions. In organizing the cooperation of a higher education institution with a business structure (or business structures), according to A. Didik and M. Pogorelov, in order to satisfy the interests of each participant of interaction it is necessary to "combine" the interests of one of them with the resources of the other and spend such the procedure for all participants in the "institution of higher education - business structure". It is then that cooperation on a voluntary basis will be productive due to the presence of interest of each of the participants of the interaction [5].

At present, the process of practical communication of Ukrainian universities with business representatives is taking place in several main areas (See Table 2).

#### **2.4 Industrial placements (internships) and job fair**

The most common form of cooperation between business structures and universities is assistance in organizing industrial placements (internships) for students, which is implemented by 71% of enterprises. Only 32% of enterprises practice engaging students in the enterprise [20]. However, the idea of introducing dual education has recently become widespread in Ukraine, approved by the Cabinet of Ministers of Ukraine in September 2018 [14]. This Concept was the result of two and a half years of discussions between experts, employers, educational institutions and authorities. The essence of such a system lies in the close interaction between the enterprise and educational institutions through social partnership. During 2015–2017, an experiment was conducted on the organization of the educational-production process with elements of the dual form of education in the vocational schools of Kyiv, Lviv and Zaporizhzhya. The pilot project confirmed positive results: high level of employment - up to 97%, improvement of the quality of vocational training, more stable and mutually beneficial cooperation with employers. The dissemination of the experience of

three cities takes place in several stages, where the first is the development of a regulatory framework, since 2020 - the development of dual education models, project implementation and performance evaluation, and since 2023 - the emergence of dual education clusters that combine educational institutions and interested employers [13]. Today, universities are also involved in the dual education project, mainly in technical specialties. Thus, the Ukrainian Catholic University (Lviv) and the IT company SoftServe have signed a document according to which the company will introduce into the curriculum a new course of Deep Reinforcement Learning on artificial intelligence and state-of-the-art machine learning algorithms. SoftServe experts will teach the discipline [24]. A number of agreements were signed with enterprises and institutions by the National Technical University of Ukraine «KPI named after Igor Sikorsky», their main goal is to train high-quality qualified personnel for work in the space industry of Ukraine and, in particular, at the company “Firefly Aerospace Space Ukraine”. According to the agreements, a Space Science and Technology Training Center was created within the Institute of Aerospace Technologies (IAT). This center will operate on the principle of dual education [10]. The idea of introducing dual education was also supported by some other universities in Kyiv, Lviv, as well as Odessa, Dnipro.

Another area is job fairs. Both large and small companies can participate in such activities. Among the benefits for business from this form of cooperation can be identified the possibility of establishing relationships with the institution, access to other forms of cooperation, presentation of the company as an employer of student audiences. For educational institutions, a job fair is a kind of indicator of successful cooperation with employers, an opportunity to show students the extent of interaction with companies, to emphasize that the university not only provides an opportunity to get education, but also facilitates employment [13]. For students, the job fairs are important because it is at such events that they can feel the interview when hiring, communicating one-on-one with the manager-representative of the firm, company. The student can also find out about the prospect and demand of the chosen profession, the real salary, the possibility of improving their specialization and so on. Interesting is the fact that job fairs are a long-term way of finding a job. Many companies participate in the fairs not only to close the vacancies, but also to solve the task of forming a database of their organization's personnel reserve. Very often job offers begin to arrive some time after the fair, when new vacancies appear in the company and staff members refer to a previously formed database [6]. Thus, in 2019, a number of job fairs were held in Stud-Point by the youth employment organization in Kyiv, Dnipro, Odessa, Kharkiv. Each event took place at a certain faculty, that was thematic. Employers participating in the job fair in Kyiv were teams of 64 companies, including professionals such as Join The Idea, Aroma Kava, Metro, 1 + 1 Media, Lifecell, Nova Poshta, Deloitte, EY, ePravo and many others. Visitors to the job fair could personally interact with staff members of the represented companies, optionally interview and even be invited to an internship with a potential employer or immediately to work. Free trainings and consultations were held during the job fair.

## 2.5 Sponsorship as a kind of cooperation

A separate kind of cooperation between business and universities is sponsorship through conferences, round tables, forums. At the same time, it is important to focus on the sponsor according to the topic of the planned event, because most of the organizers' proposals are the speech of the sponsor at the meeting, a partial influence on the content of the speeches of honorary guests and speakers, the priority attitude throughout the event period, the ability to brand pens, folders, other devices commonly used in this kind of event.

Sponsorship is beneficial to business structures primarily because of the opportunity to expand its target audience, consolidate its own image, and enhance the status of a powerful player in the business arena. It enables businesses and companies to present their own brand and, from a professional point of view, evaluate and listen to students as potential employees. An interesting form of cooperation can be the development of a system of charitable financial support of universities by business structures, as well as the organization and holding of joint events not only by universities, but also by business. An example of the promising nature of such steps could be the experience of the ZM technology company, one of the areas of activity of which is healthcare.

Together with the medical universities of Odessa, Kyiv, Lviv, Zaporizhia, Kharkiv, Vinnytsia, Sumy the company installed the latest medical equipment in their departments. For the company the obvious advantage of cooperation is introducing students to the products of ZM company and the possibility of forming brand loyalty. For teachers and students - working with medical equipment of the company, which is the world standard of quality. This program and innovative products of ZM Company allow departments and students to implement modern approaches in the process of teaching and making accurate diagnoses in future medical practice. About 5,000 students have been able to improve their auscultation skills with an acoustic device since the beginning of the collaboration [23].

An interesting form of cooperation is also holding open days at universities, where prospective students can get acquainted with all the benefits of studying in a particular institution. Also, these events usually announce information about signed agreements with business organizations, students 'work placement at enterprises, prospects for graduates' employment. However, job fairs remain popular with employers' participation events, while only 22% of surveyed respondents actively attend open days [1].

At the same time, the days of the open doors are interesting and informative, and the guests are usually informed about the features of the introductory campaign both by representatives of the units and by representatives of the admissions committee; Deans and directors take care of the information stands of faculties and institutes, and any educational program is voiced by its authors [16].

On open days, there are often mini-concerts, workshops, quests, sports. Such actions attract a large number of visitors: over 5,000 people attended the event (4 exhibitions over 2 years), and coverage of the events created by the KNU Expo All-University Open Door Network network event reached over 30,000 users each time [16].



**Table 1.** Forms of cooperation between business structures and universities

Directions of cooperation					
Industrial practice (internship)	Organization of laboratories, scientific centers, basic departments.	Reading acquaintances lectures by business representatives for university students	Job fair and participation in open days at universities	Sponsorship (as well as direct financial assistance and event sponsorship)	Organization of business incubators at Universities

## 2.6 The technical and teaching sides of cooperation

Regarding the types of prospective cooperation, the organization of laboratories, scientific centers, basic departments can serve as one of them. With such cooperation, the university receives modern equipment, new areas of work with students are developed, and employers in this way receive the opportunity to train personnel in accordance with the specifics of the company. Scientific centers and laboratories allow business structures to select the best students, provide them with a place to practice (internship), and subsequently provide a full-fledged workplace [20]. As an example, at NTU Kharkiv Polytechnic Institute there are two centers of commercialization of scientific and technical developments: the Center for Commercialization of Intellectual Property and Technology Transfer and the Center for Technology Transfer. The Technology Transfer Center was established with the participation of the Northeast Scientific Center of the NAS of Ukraine, the National Technical University "Kharkiv Polytechnic Institute", the NGO "International Cooperation Agency", the association "Kharkiv Marketing Center", LLC "Kharkiv Regional Investment Center", the Center for Small Business Development Kharkov Technologies.

The main purpose of the Center for Technology Transfer is to develop and implement an effective mechanism for transferring ready-to-use domestic and foreign high technologies to production [16]. A similar goal is set by scientific centers established at Kyiv National Economic University, Zaporizhzhya National University, Kyiv National University named after Taras Shevchenko and others.

Another promising form of cooperation is reading business lectures from business representatives for university students. It allows to diversify the educational process, to add practical character to theoretical materials. Companies can thus introduce themselves to students [13].

At the same time, demonstrating the activities of companies and organizations in open lectures often activates the mobility of students and teachers. On the one hand, this is a positive thing, because this is how the exchange of achievements and knowledge occurs, and foreign experience in learning and teaching is acquired. However, on the other hand, the negative social consequence of such cooperation is the desire of young people to leave Ukraine. The results of the survey [12] showed that 21% of the respondents expressed a desire to work abroad for a while, but then return to Ukraine, 6.2% - would like to study abroad but then return to Ukraine. However,

11.7% of young people aged 14-34 are looking for opportunities to emigrate from Ukraine, and 4.3% plan to do so in the near future.

The reasons for migration of young people abroad are mainly economic reasons: to earn money for the sake of material well-being (47.8% of those who have expressed a desire to emigrate) and to have better opportunities to work abroad than in Ukraine (39.3% of those who expressed a desire to emigrate). That is why it is important to develop at the universities such economic and organizational mechanisms that can enhance the scientific and innovative potential of Ukrainian business enterprises. Then the companies will be interested in hiring university graduates to ensure their stable earnings and career prospects. All this indicates the need for constant direct cooperation between business structures and universities, which contributes to the achievement of economic, cultural prosperity, laying the foundations for the successful development of society as a whole [21].

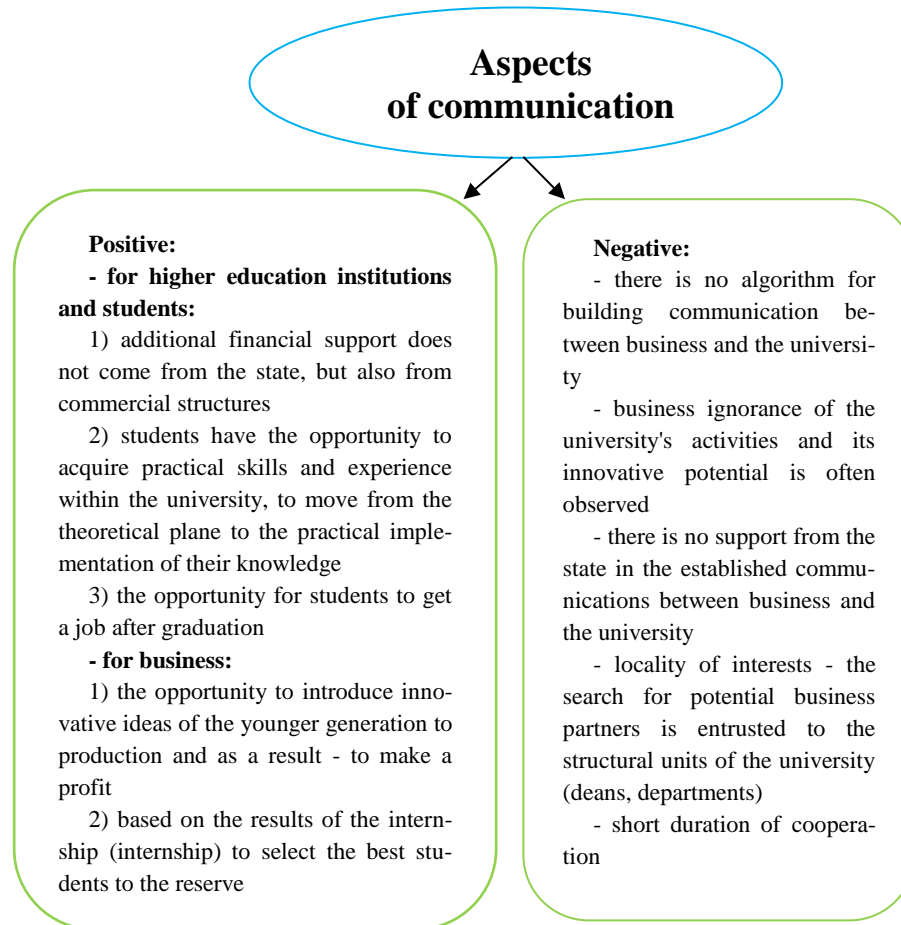
Recently, you can find information about the organization of business incubator universities. This form of cooperation is interesting and mutually beneficial, since it allows you to develop national education and attract additional foreign investment. Incubators are an important tool of an innovation system whereby scientific groups, authors of new developments and technologies, together with the universities where these developments originate, create new high-tech companies, which usually have intellectual property rights in the authorized capital [3].

Thus, in November 2018, a number of meetings took place in Kharkiv to establish a business incubator at the National Technical University of Kharkiv Polytechnic Institute. Guests were shown the space for a future business incubator. The scientists and masters of KPI presented innovative developments in the field of biomedical electronics, chemical technologies, materials science, electric motors and building materials. Speakers as Project Experts: US Financier, Ukraine Phoenix Venture Capital Fund Representative Charles Whitehead, USAID (USA) Consultant William Merker, UPEC Research & Development Director, Edward Simson Corporation, and others. The incubator will be available to academics, faculty and university students, as well as any startup groups. Incubation will include projects related to a wide range of technologies - engineering, pharmacology, medicine, information technology, artificial intelligence, blockchain [3]. Similar youth business incubators operate at KNEU, NAU, Kyiv National University named after Taras Shevchenko to solve business problems by implementing innovative startup projects.

One of the promising areas of business involvement in cooperation with universities is to enable companies to participate in discussions, preparation of student curricula and plans for their work. Collaboration of Samsung Electronics Ukraine (a leading manufacturer of electronics and home appliances) with NTUU "KPI named after Igor Sikorsky" was involved in organizing and conducting two semesters of programming lessons, which included the following disciplines: cryptography, video processing and high-performance computing on GPUs, advanced machine learning and natural language processing methods. The company has also installed a smart class in one of the enclosures, equipped with a number of innovative Samsung products, including an interactive whiteboard, tablets of the latest models, multifunctional devices and software [23].

## 2.7 Results of research

In today's realities in the issue of interaction between business and universities, there is a tendency to move away from only communication in the network plane to real practical actions. However, unfortunately, this trend is only developing, and therefore not devoid of both positive and negative aspects.



## 3 Conclusions

As a result of the research, the main directions of cooperation between Ukrainian universities and business were highlighted. The specific examples demonstrate qualitative changes in approaches to the organization of the educational process, primarily through the creation of scientific centers, laboratories, business incubators, where each student has the opportunity to demonstrate their own start-up project and become part of a specific company as an employee or young specialist. The most

priority ways of further cooperation of business structures and universities of Ukraine are identified and it is found that the main factor determining the prospects of cooperation between business and universities remains the support of this process at the national legislative level. A detailed analysis of the experience of foreign countries, its improvement and testing in the Ukrainian scientific space can also become a key factor and bring Ukrainian education closer to European standards.

## References

1. Best Employer 2018 - Student Preference Research, <https://eba.com.ua/najkrashhyj-robotodavets-2018-doslidzhennya-vpodoban-studentiv/>, last accessed 2020/04/11.
2. Bezvykh S.: Social partnership of science and business: forms of interaction, problems and recommendations for their solution, Bulletin of the Khmelnytsky National University. Economic sciences, 3, pp. 7-14 (2015)
3. Business incubator in KPI: New leak, <https://www.kpi.kharkov.ua/eng/2018/11/29/biznes-inkubator-hpi/>. last accessed 2020/04/18.
4. Dankov, J.: Collaboration of universities and enterprises at the present stage of development of social and economic relations of Ukraine, Scientific Bulletin of Uzhhorod University, 4, pp. 81–84 (2013).
5. Didyk A., Pogorelov Y.: Collaboration of higher education institution with business: basic principles of organization, Series: Management and Entrepreneurship in Ukraine: Stages of Formation and Problems of Development, 889, pp. 75-84 (2018). <http://ena.lp.edu.ua:8080/handle/ntb/46949>. last accessed 2020/04/24.
6. Filippicheva A. How to use Job Fairs effectively when looking for a job? <https://www.education.ua/articles/125/>. last accessed 2020/04/24.
7. First National Forum "Business and Universities", <http://csr-ua.info/csr-ukraine/education/>.
8. Knyazhansky, V.: Business for higher education or vice versa? Day 221 (2013), <http://day.kyiv.ua/en/article/ekonomika/biznes-dlya-vishiv-chi-navpaki>.
9. Kogut, I.: Socio-economic portrait of students: survey results, CEDOS Analytical Center, <https://www.cedos.org.ua/>
10. KPI named after Igor Sikorsky visited the head of the aerospace company "Firefly Aerospace", <https://kpi.ua/2019-09-18>. last accessed 2020/04/10.
11. Mazur I. A strategy for the development of the partnership between higher education, science and business, Bulletin of the Taras Shevchenko National University of Kyiv. Economy, 12, pp. 6-11 (2014).
12. Mobility and migration attitudes of Ukrainian youth., <https://pon.org.ua/novyiny/7240-moblntst-ta-mgracyyn-nastroyi-ukrayinskoyi-molod.html>, last accessed 2020/04/10.
13. Nikitina G. What is Dual Education and Is It "Well-Forgotten Old"?, [sukhari.com.ua/shhotake-dualna-osvita-i-chi-spravdi-tse-dobre-zabute-stare.html](http://sukhari.com.ua/shhotake-dualna-osvita-i-chi-spravdi-tse-dobre-zabute-stare.html), last accessed 2020/04/10.
14. On approval of the Concept of training specialists in the dual form of education. Order of the Cabinet of Ministers of Ukraine; Concept from 09/19/2018 № 660-p, <https://zakon.rada.gov.ua/laws/show/660-2018-%D1%80>. last accessed 2020/04/18.
15. On the National Strategy for the Development of Education in Ukraine until 2021 Decree of the President of Ukraine; Strategy from 25.06.2013 № 344/2013. <https://zakon.rada.gov.ua/laws/show/344/2013#n10>, last accessed 2020/03/30.
16. Open Day of KNU EXPO, <http://univ.kiev.ua/en/knu-expo>. last accessed 2020/04/19.
17. Second National Forum "Business and Universities", <http://csr-ua.info/csr-ukraine/education/>. last accessed 2020/04/18.

18. Semenets, Y. Partnership between business, state and universities as a strategic resource for innovative development of Ukraine, *Effective Economics*, 2 (2016) [http://nbuv.gov.ua/UJRN/efek\\_2016\\_2\\_35](http://nbuv.gov.ua/UJRN/efek_2016_2_35), last accessed 2020/04/10.
19. Semov L. Collaboration of education, science, business in the implementation of the strategy of regional development of Ukraine, *Socio-economic problems of the modern period of Ukraine*, 3, pp. 455-462 (2014).
20. Tarasenko S. Partnership of universities and business: forms and prospects of development in the conditions of increasing the innovation of economy, *Economy and society*, 13, pp. 302-308, (2017).
21. University and Business: Collaboration or Ignorance? <https://kibit.edu.ua/en/universitet-biznes-sotrudnichestvo/>. last accessed 2020/04/02.
22. University Impulse Job Fair, <http://www.univ.kiev.ua/news/10228>.
23. Yankovskaya O. The Role of Universities in Economic Development of Cities, Regions, and Country: Report of the Third National Forum “Business and Universities”, [http://csr-ukraine.org/wp-content/uploads/2015/12/forum\\_publ\\_all\\_bezpolos\\_print.pdf](http://csr-ukraine.org/wp-content/uploads/2015/12/forum_publ_all_bezpolos_print.pdf).
24. Yuzvin Z. Learning to work: both theory and practice are united in higher education. <https://studway.com.ua/dualna-osvita/>. last accessed 2020/04/10.
25. Zinchenko A., Saprykina M. Skills for Ukraine 2030: A Business, 36 p. (2013).
26. Syerov Y., Shakhovska N., Fedushko S. Method of the Data Adequacy Determination of Personal Medical Profiles. *Advances in Artificial Systems for Medicine and Education II*. Volume 902, 2019. pp. 333-343. [https://doi.org/10.1007/978-3-030-12082-5\\_31](https://doi.org/10.1007/978-3-030-12082-5_31)
27. Anisimova O., Vasylenko V., Fedushko S. Social Networks as a Tool for a Higher Education Institution Image Creation. *CEUR Workshop Proceedings*. Vol 2392. P. 54–65 (2019). <http://ceur-ws.org/Vol-2392/paper5.pdf>
28. Fedushko S., Trach O., Kunch Z., Turchyn Y., Yarka U. Modelling the Behavior Classification of Social News Aggregations Users. *CEUR Workshop Proceedings*. 2019. Vol 2392. p. 95–110. <http://ceur-ws.org/Vol-2392/paper8.pdf>
29. Anisimova O., Vasylenko V., Fedushko S. Social Networks as a Tool for a Higher Education Institution Image Creation. *CEUR Workshop Proceedings*. 2019. Vol 2392. P. 54–65. <http://ceur-ws.org/Vol-2392/paper5.pdf>
30. Fedushko S., Trach O., Kunch Z., Turchyn Y., Yarka U. Modelling the Behavior Classification of Social News Aggregations Users. *CEUR Workshop Proceedings*. 2019. Vol 2392. p. 95–110. <http://ceur-ws.org/Vol-2392/paper8.pdf>
31. Zakharchenko A., Maksimtsova Y., Iurchenko V., Shevchenko V., Fedushko S. Under the Conditions of Non-Agenda Ownership: Social Media Users in the 2019 Ukrainian Presidential Elections Campaign. *CEUR Workshop Proceedings*. 2019. Vol 2392: Proceedings of the 1st International Workshop on Control, Optimisation and Analytical Processing of Social Networks (COAPSN-2019). P. 199–219. <http://ceur-ws.org/Vol-2392/paper15.pdf>
32. Hryshchuk, R., Molodetska, K., Syerov, Y.: Method of improving the information security of virtual communities in social networking services. *CEUR Workshop Proceedings*. 2392, pp. 23-41 (2019).
33. Davydova, I., Marina, O., Slianyk, A., Syerov, Y. Social networks in developing the internet strategy for libraries in Ukraine. *CEUR Workshop Proceedings*. 2392, pp. 122-133 (2019).
34. Schahovs'ka, N., Syerov, Y.: Web-community ontological representation using intelligent dataspace analyzing agent. Experience of Designing and Application of CAD Systems in Microelectronics. *Proceedings of the 10th International Conference, CADSM 2009*. pp. 479-480 (2009).