

Model of cooperation between universities and businesses in Vietnam in the context of the fourth industrial revolution

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SUMMARY:In the context of the fourth industrial revolution, higher education plays an important role in training highly qualified workers to meet social requirements. The cooperation between universities and businesses has become an important part of the strategy to improve the efficiency and innovation of education of each country. Based on the synthesis and analysis of the current situation of cooperation between universities and businesses in Vietnam. The article suggests models and solutions to improve the effectiveness of cooperation models between universities and businesses in Vietnam in the context of the fourth industrial revolution.

Keywords: University, enterprise, cooperation, model, Industry 4.0.

I. INTRODUCE

The appearance of the fourth industrial revolution (Industry 4.0) has quickly changed the characteristics of society, labor resources, global political and economic development with the development and application of new technologies such as Artificial intelligence and big data with capacity, speed and variety. The core of Industry 4.0 lies in the research and application of interdisciplinary and highly connected technologies in State management, production and business enterprises... Since then, there has been an urgent need for high-quality human resources capable of quickly adapting to changes in all aspects of socio-economic activities. From practice, this desired human resource cannot be obtained only thanks to training in university institutions. The cooperation between universities and businesses today is considered as one of the effective solutions encouraged to improve the quality of training. The training cooperation between universities and enterprises aims to shorten between theory and practice, contributing to improving the quality of training, bringing economic benefits to the whole society, learners, schools and businesses; on the

other hand, it will help students have the orientation and career choice suitable for themselves from the beginning, soon have access to the reality of the future working environment. According to a report by the Asian Development Bank, the unemployment rate of Vietnamese youth in 2020 may reach 13.2%, nearly double that of 2019 (only 6.9%). Graduates cannot find jobs, while businesses cannot recruit workers after training because they have not met the demand, many businesses have had to retrain. To solve this problem, it is necessary for schools and businesses to "shake hands" in training students. The model of linking universities with businesses is the connection between labor supply and demand taking place in the labor market to overcome an existing paradox between higher education and actual needs at enterprises, that is, graduates cannot find jobs, Meanwhile, enterprises cannot recruit workers after university training, meeting the needs of production. The fact that universities and businesses are linked together in training according to an appropriate model is an inevitable and urgent need now as well as in the future. The model of linking universities with businesses in higher education is understood as a model shaped by the close interaction between the university's human resource training process and the needs of enterprises. This model requires that the training (supply factor) must have a change in the objectives, programs, structure and quality of training to meet the needs of employers of enterprises (demand factor) in the labor market. There are 2 types: (i) Overall model: This model is formed on the basis of establishing a common cohesive pattern with many forms of cohesion in a coherent, interoperable and mutually supportive system. This type of cohesion model is relatively comprehensive and the level of cohesion is tighter, more long-term. The trend of this model at a low level may only be cohesive in training university-level human resources to meet the needs of

businesses, but can develop at a higher level into a cohesive model of both training and technology transfer or higher is the cohesive model of universities with businesses in both training, research and implementation; (ii) Specific, discrete model: It is a model established with a specific, separate form of cohesion. For example, the cohesive model in the form of university-study and work-study training; model associated with the form of theoretical training at university, skill internship at enterprises; the model associated with the form of training according to the orders of the enterprise (output standards prescribed by the enterprise); The model is associated with the form of expanding training lecture halls from universities to businesses... It can be said that the close cooperation between universities and businesses is the way to solve the problem of human resource quality to meet the requirements set in the context of the fourth industrial revolution.

II. OVERVIEW AND RESEARCH METHODOLOGY

2.1. Overview of the research situation

Partnerships between higher education institutions and businesses are becoming an increasingly important part of each country's strategy to improve the efficiency and innovation of education and training, especially in developing countries (Perkmann, 2007). There are many forms of cooperation between higher education institutions and businesses that are based on goals, scope, and organizational structure (Permann, Walsh, & K., 2008). Collaborations may focus on training or research; single or comprehensive; short-term or long-term. The "Triple helix" model can be called a three-house model. The three-house model concept of the relationship between University, Business, and the State began in the 1990s by Etzkowitz (1993), and Etzkowitz and Leydesdorff (1995), based on the work of Lowe's (1982), and Sabato and Mackenzi (1982) transitioning from the enterprise-state relationship that prevails in industrial society to a tripartite relationship between University - Enterprise - State in the knowledge society. Benefits management is an area of increasing interest, particularly in the collaborative partnership between university and business (Rita, 2016). This is why the Rita, A., Gabriela, F., Anabela, T., team conducted this study to assess the benefits and success factors that were previously identified through two different classification methods to ensure eligibility, as well as to better understand each benefit. What are the success factors and their intrinsic characteristics. Through these methods, the next goal is to perform

cause-and-effect analysis to understand which factors produce which benefits and make some theoretical assumptions based on these correlations. It is essential to understand the responsibilities and benefits achieved in the coordinated partnership between university and business. This is also a more convincing theoretical basis when forming and operating this synergy. Another study that has been conducted to analyze university-business partnerships in Russia has shown that this partnership is seen as a decisive factor in enhancing the national competitiveness of comparative studies (Alfia, 2015). The authors consider the characteristics of the integration process in Turkey and Russia, forms and areas of cooperation. A significant number of jobs have highlighted university, business and state-related partnerships that aim to enhance collaboration and benefit learners by promoting their skills to employers at businesses. With extensive vision and orientation, author PhungXuanNha has shown the need to build models of university and business cohesion related to benefits, linkage mechanisms and success conditions (PhungXuanNha, 2009). Author Tran Anh Tai has clarified the current situation of the relationship between schools and society, between trainers and users in higher education in our country today (Tran Anh Tai, 2009). On the basis of analyzing the subjective and objective causes of the laxity and unfastness of these relationships, the author has proposed a number of solutions to contribute to making the training products of universities meet the needs of the labor market in terms of quantity, quality and structure. Author Nguyen Dinh Luan has made a number of recommendations for the State, schools, businesses and learners to strengthen the cohesion between schools and businesses in training and using human resources (Nguyen Dinh Luan, 2015). Regarding higher education development policies, in a study, author Trinh Ngoc Thach suggested lessons learned in Vietnam's higher education development policy (Trinh Ngoc Thach, 2017). One of the suggestions is related to strengthening links between universities and businesses to create a mechanism to link training, scientific research with production and services in universities. This suggestion is summarized through years of research and development of higher education in developed countries. Benefits management is an area of increasing interest, particularly in the collaborative partnership between university and business (Rita, 2016). This is why the Rita, A., Gabriela, F., Anabela, T., team conducted this study to assess the benefits and success factors that were previously identified through two different

classification methods to ensure eligibility, as well as to better understand each benefit. What are the success factors and their intrinsic characteristics. Through these methods, the next goal is to perform cause-and-effect analysis to understand which factors produce which benefits and make some theoretical assumptions based on these correlations. It is essential to understand the responsibilities and benefits achieved in the coordinated partnership between university and business. This is also a more convincing theoretical basis when forming and operating this synergy. Currently, in Vietnam, many models of cooperation between universities and businesses have been introduced. However, most models are heavily theoretical and do not have specific mechanisms to guide the practical application and implementation of models. At the same time, the Government has not had specific policies to support and promote the improvement of cooperation between universities and businesses. Therefore, it is necessary to study arguments, propose models and policies to improve the effectiveness of cooperation between universities and businesses in the context of the 4.0 revolution in Vietnam.

2.2. Research methodology

The article uses research methods such as: Dialectical materialist and historical materialist methodology, statistical methods, analytical methods, comparative methods, synthesis methods, documentary research methods...

III. RESEARCH RESULTS AND DISCUSSIONS

In the context of the ongoing Industry 4.0, developing and improving the quality of human resources, especially high-quality human resources, is a "strategic breakthrough", a decisive factor to promote the development and application of science and technology, restructure the economy, transform the growth model and is the most important competitive advantage, ensuring fast, efficient and sustainable development... The challenge for universities in Vietnam is to change their training to conform to the objective necessity of the law of "supply - demand". Therefore, Vietnamese universities need to shift the training process from content access to competency-oriented training with vocational application orientation. To do this well, universities and businesses need to promote linkage, cooperation and effectively exploit its values.

In Vietnam, the State and the Government have affirmed that universities must be centers for scientific and technological research, technology

transfer and application in production and life; implement close links between enterprises, employers, training institutions and the State to develop human resources according to social needs; Considering enterprises as the center of application innovation and technology transfer, the most important source of demand of the science and technology market. One of the guiding views throughout the process of education and training reform in our country is to improve the quality of human resources on the basis of linking training with use. This view is institutionalized in Article 12 of the Law on Higher Education 2018, which contains a provision on the State policy to promote cooperation between higher education institutions and enterprises. The amendment and supplementation of a number of articles of the Law on Higher Education clearly states that the State's policy on educational development is to promote cooperation between universities and enterprises; tax incentives for scientific and technological products of universities; At the same time, it also stated the responsibility of universities to coordinate with enterprises and employers in using experts, facilities and equipment to organize practical training and internships to improve practical skills, internships and increase employment opportunities of graduates. Decision No. 69/QĐ-TTg21 of the Prime Minister approving the project on improving the quality of higher education in the period of 2019 - 2025. In particular, encouraging the mechanism of cohesion and development of the relationship between universities and businesses in many aspects. The Prime Minister's Directive No. 16/CT-TTg22 on the development of socio-economic development plans and state budget estimates in 2020 continues to mention and emphasize socio-economic development orientations and tasks to promote institutional reform and unleash resources, motivate... However, compared to the world, especially European countries and the US, innovation in this regard in Vietnam is very slow, especially policies, mechanisms and implementation solutions in practice are still inconsistent. The contents of cooperation at all levels according to the trend of integration and resource sharing for mutual development in cooperation with enterprises are limited. Therefore, the cooperation model to bring the policies of the State, the needs and resources of universities, research institutions, the needs and resources of enterprises together is a matter that needs research and implementation.

Through surveying a number of research works as well as synthesizing the results of

sociological surveys of domestic and foreign organizations on the current status of the relationship between enterprises and higher education institutions in our country over the past time, only 4% of enterprises cooperate with higher education institutions in scientific research and development; technology development; 29% of enterprises participated in seminars, seminars and teaching at training institutions. Most school-business linkages stem from immediate needs and short-term plans rather than long-term strategies (78% vs. 22%). The level of cooperation was mainly in "initial development understanding" (214 out of 493 universities that businesses recorded as "having cooperation with..."), or "short-term cooperation" (174 out of 493). Only 58 and 47 universities are considered "long-term partners" and "strategic partners" of businesses, respectively. According to a report of the Ministry of Education and Training, the survey results show that the total number of enterprises cooperating with 135 surveyed higher education institutions is 6,126 enterprises, reaching an average rate of 60 enterprises/training institutions. The most prominent cooperation activity between universities and enterprises in training is the activity of receiving students to train/practice (nearly 90%). Units that do not accept interns mainly fall into institutes or research centers (Ministry of Education and Training, 2022). Cooperative activities took 2nd place by sponsoring training and extracurricular related activities including: awarding student scholarships, organizing job fairs, and recruiting new graduates (nearly 70%). This is also the activity that most training institutions aim to find outcomes for their students. The survey results also showed that the participation of enterprises in commenting on the training program, participating in teaching mainly stopped at 30%, focusing mainly on sharing experiences and training skills for students, assessing outputs and building outcome standards

in the training program. Similarly, the number of visiting lecturers from businesses reached less than 30%. This shows that businesses are not really interested in their role in the human resource training process. Meanwhile, the participation in commenting on the training program, setting criteria for evaluating outcome standards for students is very necessary to be able to train human resources to meet the requirements of the labor market. Notably, the report also points out that not many higher education institutions collaborate in scientific research. Most school-business linkages stem from immediate needs and short-term plans rather than long-term strategies (78% vs. 22%). The level of cooperation is mainly in "initial development understanding" or "short-term cooperation". Only a few universities are being considered "long-term partners" and "strategic partners" of businesses, respectively. Regarding difficulties leading to difficult links between training institutions and enterprises, limitations from the policy mechanism accounted for 42%.

For example, the Project "Applied Career-oriented Higher Education" (POHE) shows that cooperation activities between universities and businesses in Vietnam are not really popular. Currently, some of our country's universities are strongest in cooperation with businesses such as Ho Chi Minh City University of Agriculture and Forestry with a network of 120 business partners; Some other universities, such as Hung Yen University of Technology and Education, University of Agriculture and Forestry of Hue University, have from 20 to 40 partner enterprises, most of them are very few. According to the results of this project, 72.8% of alumni participating in the POHE program meet the needs of employers; 75.5% said that "internships are really useful for the job at hand." This shows that the cooperation between universities and businesses helps students be confident, dynamic and find jobs with the right forte and training industry after graduation.

Table 1: Cooperation results obtained when interviewing 30 enterprises

No.	Contents	Number of enterprises participating in cooperation activities
1	Cooperation in research and development	4
2	Rotation of experts and lecturers	23
3	Student rotation	30
4	Commercialization of research and development results.	3
5	Training program development and implementation	25
6	Promoting lifelong learning	4
7	Supporting start-up and	18

	innovation activities	
8	Participation in university administration activities	0

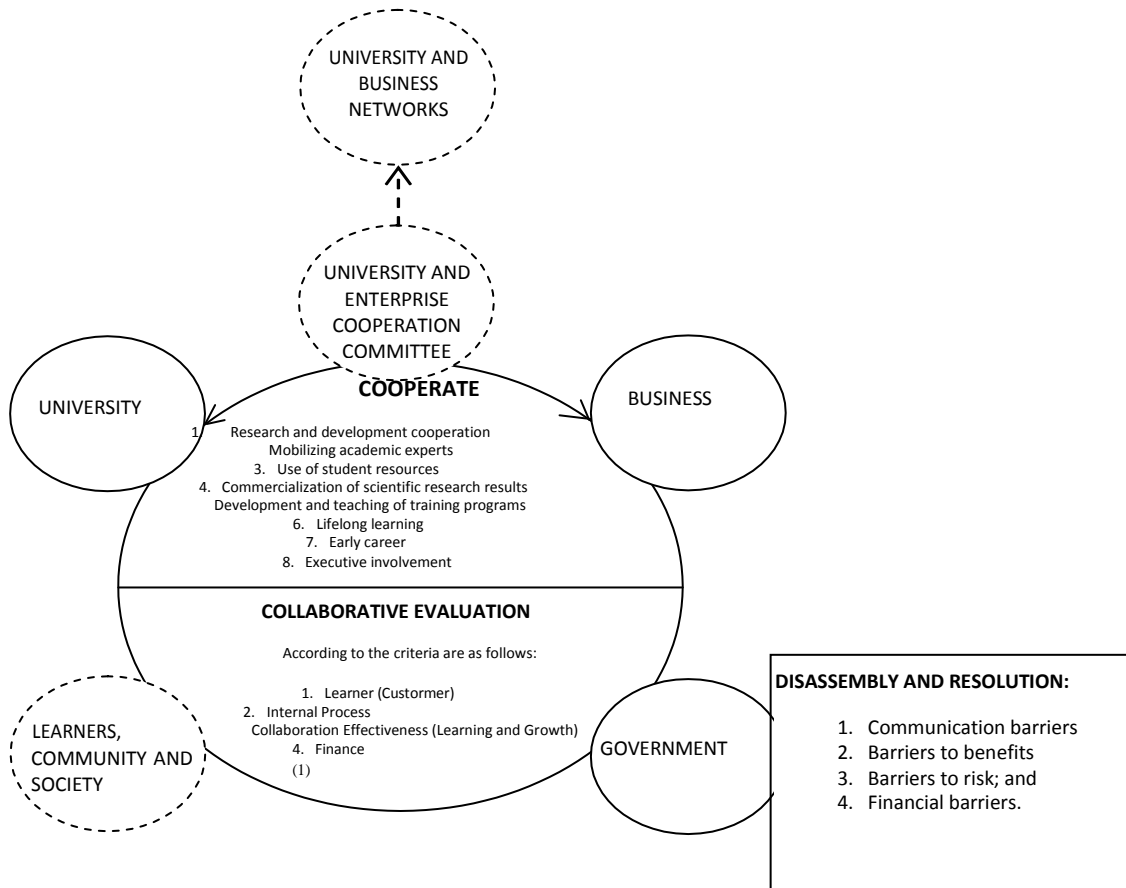
Source: Project (2020): "Applied career-oriented higher education", Ministry of Education and Training.

Thus, the cooperation model between universities and businesses in Vietnam in the past period has achieved certain results, but there are still limitations such as: The lack of necessary and reliable information for supply and demand to come together; The incapacity of higher education institutions and businesses to forge effective and sustainable links; There is a lack of motivation for both sides to build and tighten links.

Thus, the university-enterprise model has been widely applied in Vietnam and in both public and private university systems. These cooperation models have brought many benefits to both universities and businesses and especially students, however, this cooperation still has the following problems: (i) University-business cooperation in Vietnam has recently been short-term, or associated with the tenure mentality, if not seasonality, not committed to ensuring the maintenance of human resources and uniform training quality among students. There has been no successful long-term cooperation between the parties. Universities and businesses have not considered cooperation between the two sides as a means and solutions to contribute to the development to implement each side's strategy; (ii) In terms of methods, universities mainly implement the form of receiving funding from enterprises. The number of cooperation agreements and the number of partners and universities tends to increase rapidly in terms of quantity, but business partners still account for a low proportion; (iii) In terms of content, the recent cooperation of universities is mainly in training and labor supply activities for enterprises. Cooperation in scientific and technological research is still limited and has not kept pace with the world trend; (iv) The role of enterprises in training students is still blurred, with very few exchanges of business owners, business

leaders, managers,... performed for students in the classroom due to the constraints on the qualifications of the person standing on the podium; (v) The role that promotes cooperation remains that leaders of the two sides, especially business leaders and alumni, have not been built on the basis of long-term and sustainable commitments between the parties. The role of the State is not clear and has not shown the position of the creator of the "rules of the game" and the "playground" for the development of the university-enterprise model.

Therefore, in order to promote university and business cooperation, stakeholders need to reduce and completely remove barriers, build and develop sustainable development-oriented support as well as enhance practical benefits for each participant in this cooperation. Therefore, in the model of promoting cooperation between universities and enterprises, parties need to pay attention to these beneficial factors in each different period, in order to effectively influence the cooperation process. In addition to direct factors, cooperation between universities and enterprises is also influenced by internal factors, as well as external pressure from society, the government governs the formation and development of cooperation activities between universities and society as guidelines, internal policies of universities and enterprises; assessments of social contributions to the quality and effectiveness of services and products of the parties; social contribution assessments of organizations, experts and governments. These factors can affect the performance between universities and businesses; Especially, in the age of information and communication, it plays a very important role in social life activities.



-----:New proposals to promote university-business partnerships

Figure 1: Ecosystem model that promotes cooperation between universities and businesses

Source: Ho DacLoc et al. (2021): "Research arguments, propose models and policies to improve the effectiveness of cooperation between universities and businesses in the context of the 4.0 revolution in Vietnam".

The analysis shows that cooperation between universities and businesses in the context of Industry 4.0 plays a very important role. Especially, in the current period, when Vietnam's highly qualified human resources are still limited. Therefore, improving the quantity and quality of qualified and creative workers to adapt to the new environment and new context is the main issue in the socio-economic development of the knowledge economy, which is mainly based on knowledge on the basis of scientific and hi-tech development. The analysis shows that cooperation between universities and businesses in the context of Industry 4.0 plays a very important role. Especially, in the current period, when Vietnam's highly qualified human resources are still limited. Therefore, improving the quantity and quality of qualified and creative workers to adapt to the new

environment and new context is the main issue in the socio-economic development of the knowledge economy, which is mainly based on knowledge on the basis of scientific and high-tech development. In order to create channels to evaluate the effectiveness of cooperation activities between universities and businesses, 4th parties are learners, communities and society proposed to add to the ecosystem model to promote the effectiveness of cooperation between universities and businesses. In this model, the government continues to create conditions and a sustainable legal environment for cooperation activities between universities and businesses; At the same time, the Government will also play an important role in removing and addressing existing barriers that limit the development of the relationship between universities and businesses. Studies and analyses also suggest that the government needs to set up a University and Enterprise Cooperation Committee. This is the organization that plays the role of coordinating, supporting and promoting connections between universities and businesses to

be stronger, more sustainable and more effective. The organization is also involved in assessing, guiding and developing strategies to encourage universities and businesses to engage in the most effective university-business partnerships. Since then, a network of universities and businesses has been formed to increase the cohesion and effectiveness of cooperation between universities and businesses. Universities and enterprises continue to work closely together to develop cooperation activities so that universities ensure the provision of quality human resources that meet the recruitment requirements of enterprises and enterprises ensure the supply of products that meet the requirements of society for the purpose of socio-economic development. At that time, universities and businesses can improve their brand, ranking and competitiveness in human resource training, as well as quality products to meet social needs. Learners, communities and society will evaluate and use the power of product and service choices to influence the ecosystem to promote university-business partnerships that are effective and bring concrete benefits to all parties. Learners, communities and society in this proposed model are seen as a motivator, not a partner in collaboration.

IV. SOME PROPOSED SOLUTIONS TO IMPROVE THE EFFECTIVENESS OF THE COOPERATION MODEL BETWEEN UNIVERSITIES AND BUSINESSES IN VIETNAM

In the current context, cooperation between universities and businesses is an inevitable trend in the process of socio-economic development of all countries. The breadth and depth of cooperation depends heavily on the orientation of the authorities, the choice of methods as well as the compromise of the actors. The effectiveness of cooperation is always to raise the "stature", strengthen trust as well as increase the level of positive influence on the social life of the cooperating parties. Shortening the distance from lecture halls to business practice is an urgent requirement for higher education institutions and the business community, so solutions are needed to improve the effectiveness of the cooperation model between universities and businesses in Vietnam:

Firstly, it is necessary to encourage the strengthening of policies for enterprises to participate more and more deeply in the training activities of universities in Vietnam. Promote more participation of technological and technical human resources in training programs and enterprises, create conditions for scientists to participate more

in business processes; The problem of students interning at enterprises is more, more substantive. Regarding the use of resources, including investment, use of resources from facilities, financial resources ... of university to business and enterprise to university.

Second, Set up a specialized department to link and cooperate with enterprises. Have a strategy to link with businesses in two main forms: Sign cooperation agreements on training and technology transfer, or become shareholders of enterprises (in the form of individual schools or linking universities in the same training discipline). Also from this linkage, the school can penetrate deeply into the business to understand the requirements of high-quality human resources, the need for technology transfer ... This is also a condition for universities to promote their brands, improve their capacity and financial investment efficiency in the face of the trend of "university autonomy". Establish a cohesive relationship with a network of businesses that match your school's strengths (same industry). Universities can also study the establishment of training service organizations associated with the needs of businesses (training marketing, school brand PR, labor market information, career counseling, job placement ...).

Third, the Group of Policy Solutions creates momentum between higher education institutions and enterprises. Specifically, complete and actively organize and implement the National Qualifications Framework. There should be a specialized body for the implementation of the National Qualifications Framework, which includes representatives of higher education institutions as well as business representatives. At the same time, expand existing funding projects, attract innovation grant programs, encourage research projects on the basis of cooperation between higher education institutions and enterprises. The Ministry of Science and Technology shall coordinate with the Ministry of Finance, the Ministry of Planning and Investment, the Ministry of Education and Training and other ministries in charge of sectors to accompany and coordinate research and promulgate policies and mechanisms for this content.

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