THE NEW "CONNECTING MODEL" IN UNDERGRADUATE EDUCATION

H. Le Ngoc[1], V. Truong Doan[2]

[1]HCMC Open University (VIETNAM)
[2]HCMC University of Technology and Education (VIETNAM)

Abstract

The linkages between schools and enterprises are becoming the most important means of undergraduate education outcome. Universities always stand in need of coordinating with employers to help themselves catch the demand of market on the labor force. On the other hand, it is good news for enterprises if there is a training agent that can provide labors who can meet their demand. There was a lot of reliable evidence to show that students, teachers, parents, business, schools as a whole and the wider community can all benefit from school–business partnerships.

The Industry 4.0 is an indispensable technology trend that Vietnam must aim to catch up with developed countries in the world with intelligent technologies such as artificial intelligence, Internet, automation, technology of 3D printing. Therefore, the demand of quantity and quality human resources in information technology is quite enormously. In this article, we propose a new "connecting model" in undergraduate education to make a closer coordination between enterprises and universities. That is, businesses and enterprises will be directly involved in teaching and training in the course of the school. Content such as training syllabus, assessment process, facilities, teaching staff that are decided by the related businesses. Those solutions relate to universities, enterprises and the labor market as well.

Keywords: linkages in education, connecting model, training link model, undergraduate education

1 INTRODUCTION

In Vietnam, According to the Government's Resolution No. 14/2005 / NQ-CP of November 2 in 2005, setting goals for the Vietnamese education system from 2006 to 2020, universities, colleges and vocational training will have to train all students in the direction of practical education appropriate to the actual situation and meet the needs of enterprise and society. In general, the current teaching activities of colleges and universities are heavy on theory and exercises. Practical lessons not only account for a small percentage but also practice exercises and discussion activities in class, practical activities at the enterprise account for a very small percentage (Nguyen Kim Dung, Pham Thi Huong, 2017),. In fact, the demand from the enterprise needs many human resources who are knowledgeable in practical jobs, quickly approach and perform well the assigned work after are being employed. (Le Thi Hai Van, 2018).

In the limit of this article, we focus on researching training activities in Information Technology industry, an industry that have an important role of the fourth industrial revolution, including Concept of cooperative relationship between school and enterprise; Mode of cooperation; Cooperation model; Types of links between schools and businesses; The necessity of linking the status of joint training activities of IT majors at some universities in Ho Chi Minh City; Proposing a new linkage model - connecting model - in training university IT sector, and assessing this model of some IT experts and IT human resource users.

The current situation of IT human resources is facing the following issues: Demand always exceeds supply: According to the Ministry of Information and Communications, ICT has become a large economic sector, based on knowledge and technology with a scale of 100 billion USD, export value of about 93 billion USD, trade surplus of over 25 billion USD and has approximately 1 million employees. However, this large economic sector is facing a simple problem of human resources. Based on detailed statistics, Mr. Phi Anh Tuan - Vice President of Ho Chi Minh City Computer Association. HCM - emphasized with ICT industry, demand always exceeds supply. According to statistics of the Ministry of Education and Training, there are currently about 50,000 IT students every year. Meanwhile, Vietnam Works forecast that by 2020, Vietnam can short of 400,000 IT workers, and need to supply 78,000 new employees annually. Despite the large demand for human resources, the domestic training programs have not met

the social development needs, especially in training high quality engineers: currently only about 28% meet the requirements, 72% had to take additional training for at least 3 months. (Phi Anh Tuan, 2019).

Supply is not sufficient demand: "Demand always exceeds supply" in terms of quantity, but when giving the assessment of enterprises about the quality of students, Mr. Phi Anh Tuan asserted: the quality of "supply" does not meet "demand".The quality of human resources is much different between the top and the bottom, between a number of pilot schools and the rest. Deputy Minister of Information and Communications Phan Tam assessed that Vietnam was present at the beginning of the fourth industrial revolution (4. 0). In order to grasp the opportunities that the revolution 4.0 brings, to build successfully e-government and e-citizens, according to him, there must be information technology (IT) resources with national standards. International. However, the Deputy Minister also frankly admitted that Vietnam's IT human resources have not met the needs of society, the needs of the industrial revolution 4.0. In the report on future production readiness published by the World Economic Forum, Vietnam is in the group of countries not ready for the fourth industrial revolution 4.0, ranked 70th / 100 on human resources and 81/100 on highly skilled labor. Compared with other countries in Southeast Asia in terms of human resources, Vietnam ranks behind Malaysia, Thailand and the Philippines. Currently, although the quality of input increases and the quality of training is gradually improved, human resources in this field are limited in foreign languages, soft skills and practical skills, especially labor productivity. The cave is not yet high. Currently, the labor structure in IT enterprises included three groups: senior, trained and vocational. In particular, senior workers are very few and the trained human resources are not significant. (Phan Tam, 2018).

Currently, enterprises have joined with the school to design products or these two objects are still very far apart and blame each other? The problem of connecting enterprises and schools is not new, but to be effective must become the needs of both sides themselves. In fact, many universities and enterprises have signed cooperation, but the effectiveness is not high (Nguyen Dinh Luan, 2015). Therefore, enterprises should not only support by "giving" scholarships or internship opportunities as they have been doing for a long time, but also need to pay attention to accompanying universities and designing training programs standards, adapt to the human resource requirements of the enterprise. Training programs that should be designed from the market demand, intensify sending students to internships, "dipping" themselves into information technology businesses, such as medical schools and hospitals.

2 SELECTED LINKAGE MODELS BETWEEN BUSINESS AND SCHOOL

Collaborative relationships between schools and enterprises are activities that include interaction, support, assistance, and transfer of knowledge and experience in educational training to the benefit of both parties. (“Workshop: collaborative pilot models”, 2018)

2. 1 Australian training model

In this model, students not only learn with lecturers, but also from experts specializing in the field of training. Students can learn and understand real-world jobs in their field of expertise under the direction of experts. In parallel with the school's curriculum, the school has partnerships with enterprises to ensure the best practicality and output for students. The biggest advantage of this model is high career orientation. From the beginning, students understand what they need and want to develop their own plan

2. 2 Norway training model: Flexible model

This model comes from the first form of training is 2-2, meaning that students can study for 2 years at the school and 2 years to practice at the enterprise. Since then, many educational institutions in Norway have developed into many different models suitable to each industry or the nature of the school, including model 1-3 means 1 year of schooling and 3 years in the enterprise and model 0-4 is 4-year vocational training in a row at the enterprise. The advantage of this model lies in practicality, learning knowledge through specific practice. Students in the final years acquainted directly with the actual production.

2.3 German training model - Dual model - Double benefit

The dual training model in Germany is a combination of 30/70-oriented learning, which means learning 30% of theory at school and 70% training the knowledge learned at the enterprise and working schedule in the enterprise. Therefore, this model brings a huge advantage that is the continuity in training

activities, the theory and practice go in hand not only help students acquire knowledge more easily, but also increase the properties be active in students' self-study.

Although the above models are different, they are basically built from one of the following link forms:

2.4 Form of association in enrollment and training:

Train the school's human resources according to orders or at least according to the recruitment needs of enterprises and society. According to this training direction, the school and enterprises make long-term plans, identify goals and deploy career guidance to students while they are in high school. The training process always has cooperation and suggestions from enterprises. (Dieter Ruler, 2013)

Training human resources sent by enterprises. Accordingly, the enterprise proactively enrolls and recruits training with a certain number and conditions after a business cooperation agreement. The school trains at the request of the enterprise based on the approved training program. (Dosun Shin, 2009)

These two types of training require both the school and the enterprise to identify the training objectives and content to meet both sides' needs and capacities. The framework program operated by the participation and criticism of both parties. The quality of hands-on training also requires the participation of guidance and training from the enterprises, the allocation of duration and the layout of the program studied and implemented by lecturers. (Julio A. Pertuze, 2010)

The training method changes appropriately in the direction of narrowing the gap between the enterprise and school in the following manner: Firstly training in the form of learning by doing: according, the employees continue to work in the committee day and evening study. Secondly, going to practice, visit, go on a field trip: During the course of study, students will be exposed to practice at the enterprise for a period of 1 day (sightseeing, field trips), 5 weeks (mid-term internship) to 2 months (graduate practice) (Davey, T., Baaken, 2011).

2.5 Form of association in labor and research:

Enterprises and schools coordinate in ensuring the number of trained and stable human resources during the training course. The school's research and educational team includes lecturers, officials in charge, and administrators. The training and practice team of the enterprise includes leading officials, technical staff and senior experts. These labor resources improved to enhance professional skills regularly, ensuring the professionalism and teaching and training capacity (Abramo, G., D'Angelo, 2009).

The process of labor and research between the two is always coordinated and integrated. The effective method is practical trainers and direct, indirect employees at the enterprise or project. Technical staff of the enterprise is allowed exchanging, talking and experience with students to have appropriate methods to guide students' competence. (“Institutional Case Studies on the Links”, 2011)

This research content based on urgent and real requirements or/ and demands from society and enterprises. The researcher will study applied, real work, not theoretical models.

3 SURVEYING THE CURRENT STATUS ABOUT LINKING ACTIVITIES IN TRAINING IN HO CHI MINH CITY

In this research paper, we survey related objects in Ho Chi Minh City, the center of culture and economy in Vietnam. They include IT training universities, enterprises with IT industry expertise. From there, we have the situation of status training in the IT industry and the ability to meet the needs of enterprises. Therefore, we propose a new connecting model between enterprise and school in training IT industry. We conducted an experimental research model based on using the questionnaire to survey the opinions of three main target groups, including: lecturers, students at the colleges and universities, enterprises related to information technology in Ho Chi Minh City area. Therefore, we propose new “CONNECTING MODEL” between enterprise and school in training IT industry. In this new proposal model, we use Expert method to analyze the survey data of the experimental model and the achieved results are quite positive.

3.1 Survey results of Lecturers

For the lecturers, we surveyed the opinions of more than 20 lecturers working in IT groups at universities and colleges in Ho Chi Minh City area. In which more than 50% are lecturers with more than 20 years of experience in the IT industry.

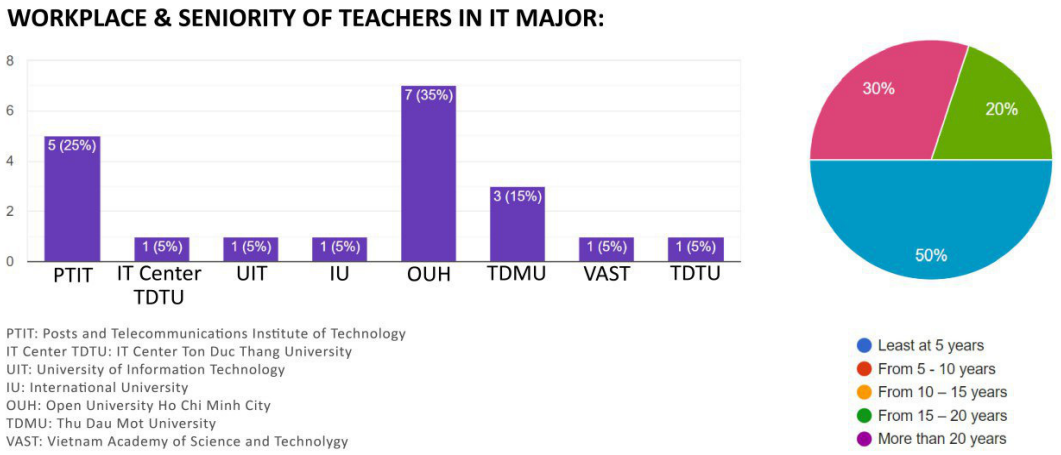

Figure 1. Workplace & Seniority of teachers in major.

According to the survey of lecturers, we receive very positive comments. Most lecturers think that the role of enterprises and employers is extremely important to the development and development of IT industry training programs. About 60% of teachers think that linking activities of enterprises at the school implemented a lot and partly related to the training program. However, the current situation of corporate linkage training in the IT industry group is still not good, does not meet the social needs, the training program still lacks cohesion between the university and enterprise. Therefore, in order to improve the quality of training, to meet the recruitment needs of enterprises and society, the training program updated and changed regularly. In addition, lecturers are very willing to join with enterprises to build a new training link model as proposed.

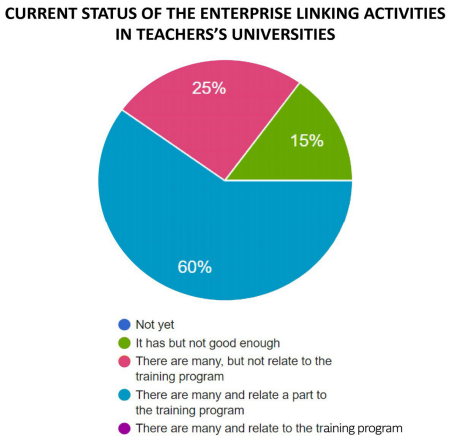

Figure 2. Currently status of the enterprise linking activities in the teacher's universities

3.2 Survey results of Students

Besides surveying lecturers, we also conduct random surveys of more than 50 students who have been or are currently attending universities and colleges in Ho Chi Minh City. Positive contribution of students through the survey, more than 66% of students realized that enterprise and employers have an important role and greatly influence the training of IT students. However, the participation of enterprise in the current training programs is very little and not focused. Most students now have very few opportunities to interact with real careers, so it is still very vague, not fully aware of what the job will be and what

direction they will do in the enterprise after graduation. Therefore, when asked about our proposed model above, more than 75% of students are interested in enrolling in this new training program. This is a good sign for our efforts to build our proposed model.

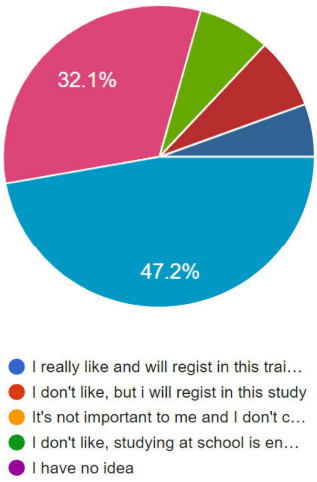

Figure 3. The percentage of students register linking training program that engages enterprises.

3.3 Survey results of Enterprises

It is one of the research subjects having an important role and great influence on the improvement and development of IT training programs. We also conducted about 50 surveys to gather opinions from enterprises / employers from different types of enterprises. In which more than 55% are enterprises with many experiments working in the IT industry.

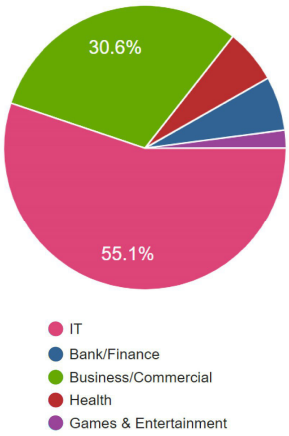

Figure 4. Business type of the Company / Division / Enterprise participating in the survey.

According to the survey results, most enterprise have the same opinion with students and lecturers about the current situation of linkages and training programs are not good really, requiring coordination between the schools and enterprise in renovating training programs.

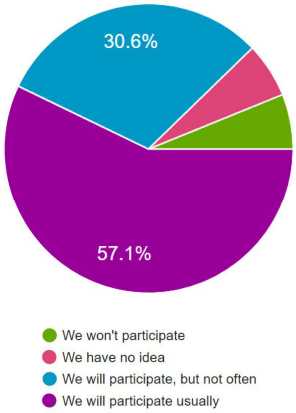

Figure 5. The rate of participating in linking training program with the school / IT Academy at the enterprises.

One of the positive signs that we gathered from the survey results is that when asked if invited to participate in joint training activities with IT schools / institutions, more than 57% the opinions of enterprise will be heavily involved in supporting the general training, guidance, evaluation and jointly building, developing subjects according to their orientation.

3.4 The new proposal of "Connecting model".

Understanding the situation of current linkage in undergraduate between enterprises and schools, we should have a more flexible way of connecting, a more efficiency way in linking to generate better outcomes. What we are seeing is the reality and the real works / experiences that should be brought to school to students, then students would not be surprised, and they can adapt well the needs of jobs. With this aim, we would propose a new "Connecting model" which is the development of the previous linkage model in education. In our new model, we want to focus more on the role of enterprises / companies in the actual life. Especially the IT industry, the demand of labor force is much higher and requires more and more skillful.

Looking through the most general curriculum of undergraduate program in Vietnam, which is for Information Technology, we can see that the involvement of enterprise will normally appear in the last year via the internship subject. This internship may take 3 to 8 weeks on internship and let students find out what enterprise have themselves. We can easily see the role of actual enterprises out there in the society is so little. The students cannot understand, and they take time to learn things again when they join a new enterprise. In this paper, we engage the needs of enterprise on labor to the education in the school. To do this, we would improve the role of enterprise / companies on educating & training students of the school. The enterprises / companies would have much involved and connected with the training program. The role of enterprises / companies will be increased in many aspects and tasks of educating like: program development, teaching & learning methodology, assessment and evaluation.

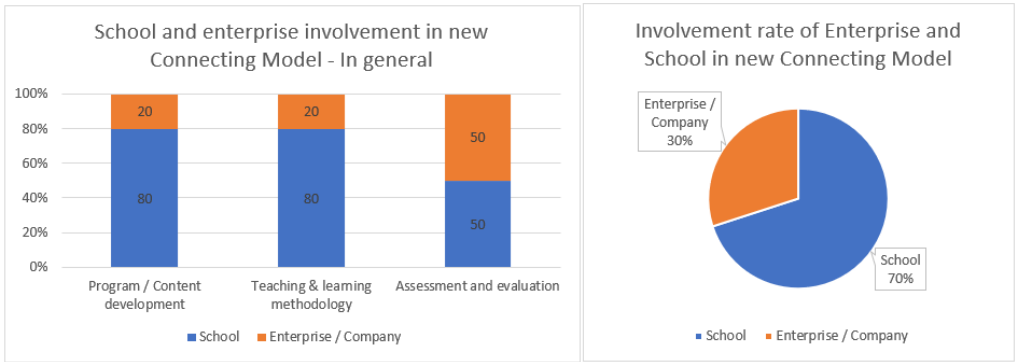

Figure 6. The more involvement of enterprise in under-graduate IT course.

With this new model, we divide the subjects into 03 types. The first type is that the enterprise will be responsible from 80 ~ 100%, means that the involvement of school is 0 ~ 20%, the school just do the job of observation and management. The second type is that that the enterprise will be responsible from 40 ~ 50%. With this type, the subject need to be built and developed from both sides, both enterprise and school need to cooperate to work out a best plan for this subject in a most efficient way. In this, the enterprise can be an experienced teacher, can join any education activities and connect those to their real business. Enterprise can bring their business request or business issue to the school, and let the students work on it as assignment, homework or even a school project. This type of subject is the new proposal of the model. And the last type is that the enterprise would not join anything.

To implement the proposed approach to the current situation, we need a best cooperation between the school and enterprises. Therefore, we need to setup a good background for this model like: cooperation policy of school, learning and teaching standardization, and we should build some other samples for many kinds of subjects, activities and events that integrating the learning process.

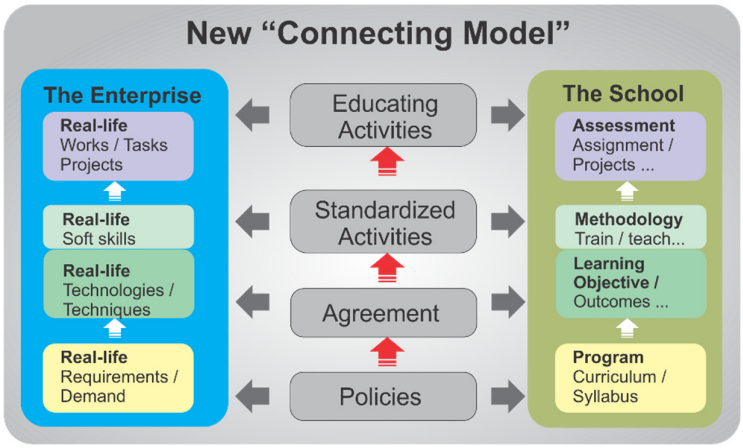

Figure 7. The new "Connecting Model" in under-graduate education

4 EVALUATION OF EXPERTS ON THE CONNECTION MODEL BETWEEN ENTERPRISE AND SCHOOL IN IT INDUSTRY.

4.1 Experts information

Due to the time limits of the research, we surveyed more than 70 top experts, who are lecturers and enterprises with many years of experience working in the IT industry. Including more than 20 surveys are ideas from lecturers of the university. More than 65% of the lecturers agreed that the content of the training program and subject curriculum built and developed by the enterprises in the proposed model was reasonable. However, to achieve positive results, it is necessary to have a coordinated participation between both businesses and the school. Therefore, most of the opinions agree that this proposed model is quite satisfactory, consistent with the current needs of society.

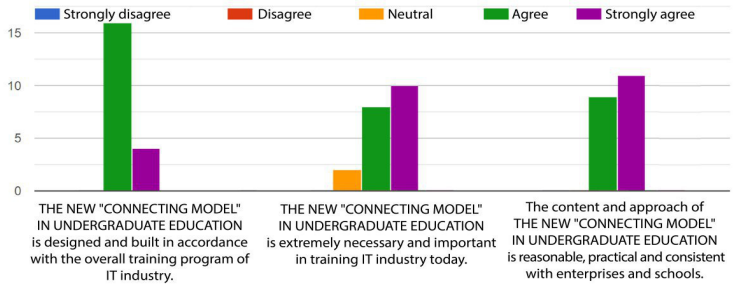

Figure 8. Lecturer's opinion about the new "CONNECTING MODEL" in undergraduate education

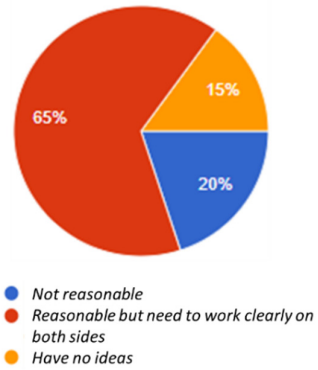

Figure 9: Lecturers' satisfied opinions on the content of the new training program is built and developed by the enterprise

We also recorded more than 50 survey results from businesses. Not only lecturers but also more 66% enterprises agree that this new proposed model is reasonable and practical. Both are very willing to participate in the development and development of this new linkage training proposal model in the future.

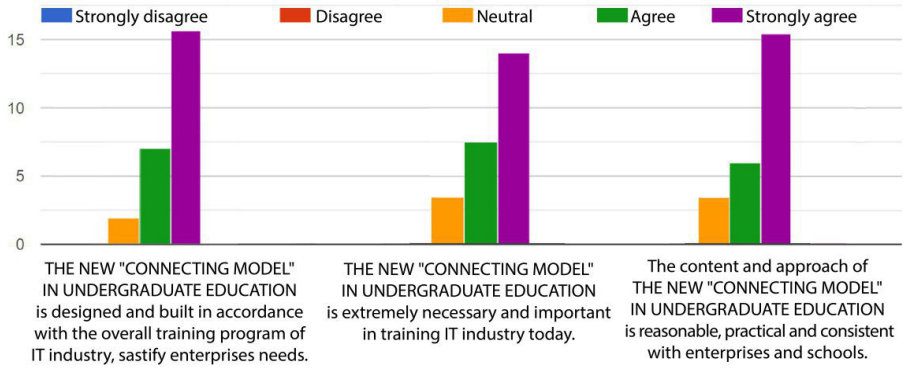

Figure 10. Enterprise's opinion about the new "CONNECTING MODEL" in undergraduate education

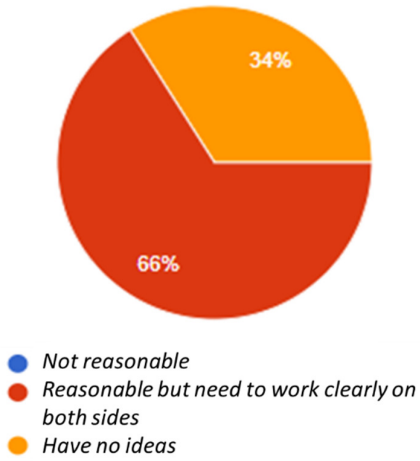

Figure 11. Enterprise' satisfied opinions on the content of the new training program is built and developed by the enterprise

4.2 Evaluate results of Experts

In this paper, we decide to choose Expert Solution to analyze our survey results. After summarizing and analyzing the survey results from the teachers in the universities, we have received many positive responses from them. Most of them consider that the new model in our research is really in accord with the overall training programs especially IT Industry. Besides, students will get used to working in enterprises after graduating easily and quickly. In addition, they also suppose that the content and approach of our new "CONNECTING MODEL" is reasonable and practical. Moreover, it will help students to prepare themselves with practical knowledge, confidence and be more active to looking for a job in future.

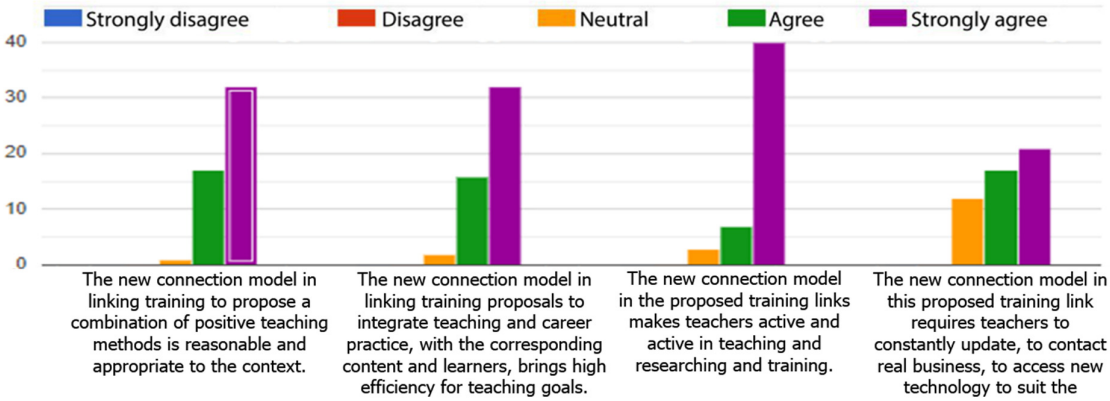

Figure 12. The agreement of lecturers on the new "CONNECTION MODEL" in training linkage

Not only teachers, but we also receive good comments from enterprise. They said that our model is extremely necessary and important in training today's IT industry. It supports their training staff with a safe time to guide inexperienced university students, in particularly, they can reduce training costs effectively by participating in joint venture activities our karma. During the period of participation in the new "CONNECTION MODEL" in LEARNING, helping the enterprise better connect the workforce and develop enterprise activities.

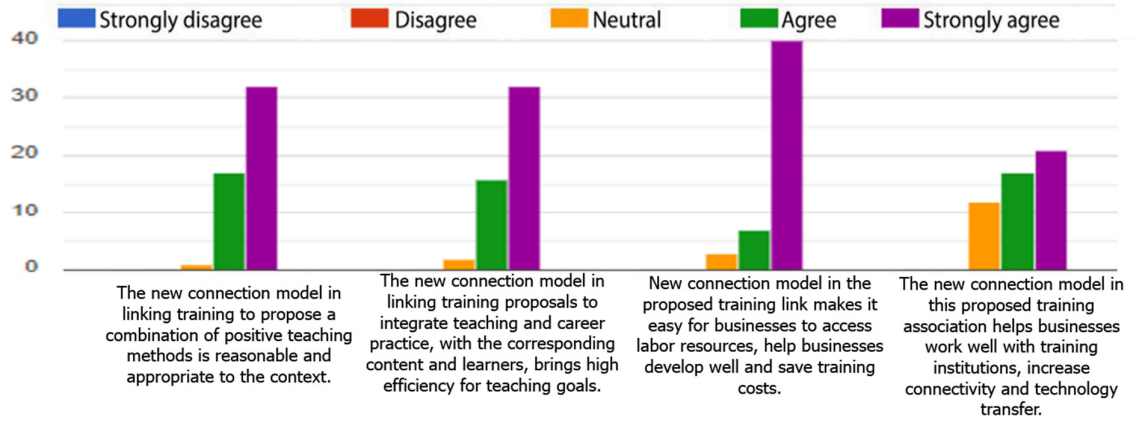

Figure 13. The agreement of enterprises about the new "CONNECTING MODEL" in training linkage

5 CONCLUSIONS

The paper summarizes the experiences that leading universities in Europe have made to build and promote university-business linkages towards the goal of improving the quality of training. In limited time, the author selects only the typical solutions and presents them in the personal view that the author deems appropriate to apply to the universities of Economics. In addition, based on the current situation of building links between Vietnamese universities and enterprises, the author has made some recommendations for applying such solutions to Vietnamese universities. However, in order to answer the question scientifically which solution is suitable for each school, it is necessary to have an empirical survey to evaluate the implemented solutions, while taking into account the factors of conditions of the

school in the current period from which to propose any of the nine above solutions are appropriate. This is also an open direction for further studies that the author expects to carry out.

ACKNOWLEDGEMENT

Thanks to the group of students, faculty, and businesses who participated in the survey and contributed their ideas to the writing team so we could complete this article.

REFERENCES

[1] Dieter Ruler, Germany's dual vocational training system: a model for other countries, Germany: Bertelsmann Stiftung, 2013.
[2] Technopolis. (2011). 15 Institutional Case Studies on the Links between Higher Education Institutions and Businesses.
[3] Dosun Shin, Design Collaboration University-Industry Partnerships in New Product Development. International Association Societies of Design Research, 2009
[4] Julio A. Pertuze, Best Practices for Industry-University Collaboration, MIT Sloan Management review, summer 2010, Vol. 5 No. 4, 81-91.
[5] Abramo, G., D'Angelo, C.A., Costa, F.D., Solazzi, M. (2009). University–industry collaboration in Italy: A bibliometric examination. Technovation, 29(6–7), 498-507.
[6] Davey, T., Baaken, T., Muros, V.G., & Meerman, A. (2011). The state of European university – business cooperation final report – Study on the cooperation between higher education institutions and public and private organisations. Munster: Science-to-Business Marketing Research Center.
[7] Le Thi Hai Van, Universities - business corporation: literature and implications at colleges, Technology and Education specialist - 10 (12-2018)
[8] Nguyen Dinh Luan (2015), "The cohesion between schools and businesses in training human resources for economic and social development in Vietnam: Situation and recommendations", Journal of Development and Social Affairs Enter, No. 22 (32), Hanoi.
[9] Nguyen Kim Dung, Pham Thi Huong (2017), "The reality of cooperation with universities and businesses in Vietnam", Journal of Science, volume 14, issue 4, 2017, Ho Chi Minh City University of Education Chi Minh.
[10] Seminar on developing high-quality ICT human resources: Integrating higher education - business institutions by the Ministry of Education and Training, Ministry of Information and Communications
[11] Conference on "Connecting IT products, services and human resources to produce Vietnam IT brand products and services in 2018", Ministry of Information and Communications
[12] Workshop "Models of cooperation with enterprises in vocational training - from experience to future direction"