

IMPROVE THE EFFICIENCY OF THE COOPERATION BETWEEN THE THAINGUYEN UNIVERSITY OF TECHNOLOGY AND THE ENTERPRISES

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ABSTRACT

The cooperation between the technical universities and the enterprises plays an important role in the training process of technical human resources. However, in fact, the result is still limited by content, form, policies of training, the attention of stakeholders, ... Therefore, the effectiveness of cooperation activities is not so good and it is also a factor affecting the quality of training. The paper proposes some solutions to improve the efficiency of the cooperation between the Thainguyen University of Technology (TNUT) and the enterprises in order to contribute to improving the training quality of the high-quality technical human resources for production, business, development of the enterprises and society.

KEYWORDS: Cooperation, the technical university, enterprise, training, technical competence.

1. INTRODUCTION

In the trend of international integration, in the context of the industrial revolution 4.0 and the current global competition, the training of technical human resources to meet social needs is really a challenge for technical universities in Vietnam in general and for TNUT in particular.

In training activities, technical universities are always interested in the needs of enterprises' human resources. The quality and suitability of technical human resources with the enterprise's human resource needs has decisive meaning for the existence and development of technical universities. In contrast, the efficiency of production, business activities and the development of enterprises as well as the society always depend largely on the quality of technical human resources provided by technical universities. Therefore, the cooperation between the technical universities and enterprises is really an inevitable activity, has two-way relationship and interdependence.

Although many technical universities were interested in the cooperating with enterprises. Many technical universities have invited enterprises to join the University Council, to participate in building outcomes, training programs, and organized for students to do internships before graduating in enterprises. In addition, every year, the enterprises usually interview, recruit, ... the employees at the technical universities. However, in reality, the effectiveness of this activity has not been achieved as

that we expected. The technical universities in general and TNUT in particular have always been faced to complaints from many enterprises about the difficulty of adapting careers of learners and the high rate of engineers who are unemployed or worked in other majors. In contrast, many enterprises have been faced to difficulties in recruiting human resources or taken them a lot of time, cost and effort to retrain employees. Therefore, it caused reduction of the training efficiency of technical universities, reduction the efficiency of production and business of enterprises in particular and affected the development of society in general.

TNUT is a university that plays a very important role in providing technical human resources for the whole country in general and especially for the Northern Midlands and Mountains in Vietnam in particular. Therefore, the researching the current situation, identifying the causes and finding solutions to improve the efficiency of cooperation between TNUT and enterprises is really a practical, urgent issue for TNUT, enterprises, society in the current context.

2. CONTENT

2.1 Overview of cooperation between universities and enterprises

2.1.1 The training quality of the universities

Quality of training is always the most important issue for all universities and improving the quality of training is always considered their most important task. Although so important, training quality is still a difficult concept to define and measure. In education, it usually can be judged as excellence, perfection, and fitness for the target of training.

There are many different methods to evaluate the quality of training [4], such as: (1) "input" (recruiting good students, reputable lecturers, good finance and facilities, ...); (2) "output" (degree of work completion of graduates, ...); (3) "added value" (output value minus input value); (4) "academic value" (the academic capacity of the lecturers); (5) "own organizational culture"; or (6) audit activities. Each of the evaluation methods has other advantages and disadvantages. However, in education, we always appreciate the connection the quality of training with the benefit of students and society. No quality, poor quality of training is synonymous with failure and prodigal training. Therefore, the training to meet the needs of the society, to meet the needs of enterprises is considered a standard to ensure the training quality of the universities.

2.1.2 The role of cooperation between universities and enterprises

The sustainable cooperation between the universities and enterprises in training process brings a lot of benefits to universities, enterprises and students [1,2].

For the universities, the cooperation with enterprises helps improve the quality of training, contribute to improve the universities' reputation with society. Besides, this relationship gives the universities the opportunity to improve the condition of facilities, finance for training process and receive information

on science, technology, human need to for the universities to develop an appropriate and effective training strategy.

For the enterprises, the cooperation with technical universities helps them have the opportunity to choose and use required labor, reduce cost of training, recruitment, probation and retraining. On the other hand, this is an good opportunity to promote their brands and images to the society, add opportunities to improve technology, foster staff to improve the quality of product of enterprises.

For the students, they have the opportunity for learn, experience to verify, understand deeply the theory, perfect career skills, increase ability adapting to practice, ... contributing to increase job opportunities and the ability to change careers in the constantly changing labor market. Therefore, building a cooperative relationship with enterprises is one of the important tasks for ensuring the training quality of technical universities and TNUT.

2.1.3 The Condition for building a cooperative relationship between universities and enterprises

The enterprises are profitable organizations, so they always interested in cost and profit. They want to have the lowest cost and the biggest benefit. The biggest benefit from cooperating with universities is suitable human resources with their development needs but without looking for labor in the free market, without wasting time and costs for retraining and be transferred inventions, consulting services, research results from universities to develop enterprises.

Universities are educational and training institutions, so they always interested the quality of training products. The benefits from the enterprises what they want to receive are enterprises' assistance for the university's training products ensure the requirements of knowledge, skills, profession, professional quality, quantity, and size of the needs of society in general and enterprises in particular. The improved quality of training will be an important condition for the universities to develop prestige, brand name, attract enrollment, attract sponsors, increase funding and facilities for training activities.

Therefore, the decisive factor in the success of cooperation between universities and enterprises is to ensure mutual benefit. It means the parties must jointly achieve their satisfactory interests.

2.2 The reality of the cooperation between universities in Vietnam, TNUT and enterprises

2.2.1 At technical universities in Vietnam

In Vietnam, many technical universities such as Hanoi University of Technology, Hanoi University of Industry, University of Electricity, ... have also focused on this activity [1,2]. The models used mainly include:

The model of Hanoi University of Science and Technology (HUST): They cooperate with Rang Dong Company in scientific research and technology transfer through the implementation of topics and

projects. In particular, the project of building two laboratories at Rang Dong Company and at HUST has brought many practical benefits.

The model of Hanoi University of Industry: They have established a Center for Cooperation with Enterprises, organized visits and internships at enterprises, sent lecturers to train at enterprises, welcomed staffs of enterprises to participate in teaching at the University.

The model of Electric Power University - Hanoi: They have developed training programs with the direct participation of employers, opened short-term training courses for electrical officers and workers, signed a cooperation agreement with the Association of Certified Accountants (ACCA) implements a high-quality program of international standards, training and exchanging lecturers and providing financial support to students.

In general, through training cooperation with enterprises, the quality of graduates of the universities has been appreciated by enterprises, the number of graduates got jobs has also improved, the rate of annual enrollment of technical universities are always high compared to majors or universities in other fields. However, the level of participation and effectiveness of the cooperation between the universities of technology and enterprises is currently not consistent with the scale and potential of both.

2.2.2 At Thainguyen Universities of Technology

TNUT belongs to Thai Nguyen University, Vietnam, was established in 1965 to meet the needs of building a contingent of scientific and technical staff to serve the industrialization and modernization of the country in general and of the Northern midlands and mountainous areas, Vietnam in particular. Currently the school has 10 faculties, 08 centers, 08 function rooms, with more than 500 officers, lecturers and has more than 7,000 students. TNUT has 07 specialized faculties. They are Faculty of Mechanical Engineering, Faculty of Electrical Engineering, Faculty of Electronics Engineering, Faculty of Automotive and Power Machinery Engineering, Faculty of Mechanical, Electrical, Electronics of Technology, Faculty of industrial economy and Faculty of Construction - Environment.

Over the years, TNUT has been interested in cooperating with enterprises in training activities, program development, scientific research and technology transfer:

The first, TNUT has implemented the government's regulations on the establishment of University Council (15 members) with 05 members (30%) being representatives of enterprises. However, the level of exploitation of these members in training activities (building training programs, participating in training, ...), scientific research,... is not really clear.

The second, TNUT has established a Center for Joint Training and Enterprises Cooperation to set up a specialized department, a clue to coordinate with enterprises in training, scientific research and technology transfer. However, the staff of the Center are part-time and their time and experience working is still limited, ... so the effectiveness of this work is not really outstanding.

The third, in a course, before graduation, each student has 7 weeks to graduate internship in enterprises (equivalent to 5 credits) or students can be visited the enterprises about 1 day/ 1 company/ 1 course. Thus, in the whole course (150 credits), students can only practice in enterprises once (5 credits, accounting for 0.03% of the course). Therefore, it can be seen that experience time in these enterprises is too little. The students have not been able to get acquainted, do not have full knowledge about enterprises and have not formed professional skills suitable to the reality of that enterprise, the internship time has ended. After graduation, if they are recruited into a certain enterprise, students consider starting from the beginning with many surprises and difficulties to be able to adapt to professional practice. In addition, TNUT has links with a number of companies such as Cannon, New Wing, Honda, and Toyota to organize for students to practice paid internships. However, this activity is new and only applicable to one industries such as mechanical, electrical and electronic industry.

The fourth, in recent years, a number of companies have coordinated with TNUT to organize consulting and recruitment interviews, for example Cannon company, Samsung, Hoang Hai corporation, LG Display company,... Because the knowledge and practical experience of many students are limited, so the number of students admitted to the interview is not much and the TNUT usually has not organized a survey to evaluate the opinions of enterprises on the implementation of task of these students at enterprise.

In addition, TNUT has also received sponsorships from a number of enterprise on laboratory equipment (AMSs, electricity, Mitsubishi companies, ...) and established the Electromechanical scholarship fund of alumni for students who study at TNUT. However, these supports mainly depend on the relationship with alumni who are working at the enterprise and have been successful.

From the above results, it can be seen that cooperation with enterprises has been paid attention by the university, but the level of investment in time, resources and efficiency is still limited. TNUT has not yet effectively exploited this potential to effectively promote training, scientific research, and technology transfer as well as contribute to improving the quality of training, reputation and brand name. In the context of the current industrial revolution 4.0, technology innovation of enterprises is extremely rapid. Therefore, making training products meeting the needs of businesses becomes even more difficult. In other words, it requires technical universities in general and TNUT to identify the causes of these limitations and build solutions to improve cooperation efficiency with enterprises.

2.3 The cause of the limited results of cooperation between TNUT and enterprise

There are many reasons for the limited results of cooperation between TNUT and enterprise. Some possible causes include:

The first, the relationship between TNUT and enterprise is unsustainable and forced. Currently, the cooperation is still mainly derived from TNUT or based on personal relationships between staff, lecturers in the university with representatives of enterprises, or successful alumni. In order for enterprises to actively cooperate and maintain long-term cooperation, TNUT must make enterprises realize the benefits and responsibilities of cooperation clearly.

The second, the relationship between the TNUT and the enterprise lacks professionalism: The staff of the Center for Enterprise Cooperation are mainly part-time, so their knowledge, experience, time, ... invested for cooperation with enterprises are limited; many lecturers lack knowledge, practical experience in enterprises and many corporate staffs lack knowledge and experience in organizing training and education. Therefore, the cooperation between TNUT and enterprises in training and production activities met some certain difficulties.

The third, TNUT and enterprises both lack information about each other, so they have not found the general agreement between the quality of training products and human resources according to the needs of enterprises. The university still mainly teaches with "what we have", "what we are good at" but do not know exactly "what enterprises lack", "what businesses need".

The fourth, the funding for capital investment and activities of TNUT are still mainly based on the budget allocated by the State and deducting the student's tuition fees. In recent years, in the general situation of universities, enrollment size has decreased, so resources (human, material, time ...) for cooperation with enterprises are also limited.

The fifth, after the graduation internship, TNUT and enterprises have not really evaluated seriously and responded promptly to the quality of training products; Enterprises and the members of the University Council have not focused on evaluating and commenting on the training process. Therefore, the students have not evaluated their own capacity to adjust promptly their learning activities. In particular, it is difficult for the university to avoid the subjectivity and not achieve the desired effect when they adjust the outcomes standards, training curriculum and training organization.

The sixth, TNUT is a multidisciplinary university, provide technical human resources for many different businesses (product cement, extract oil and gas, shipbuilding, manufacture car, motorbikes, agricultural machinery, components or electronic equipment,...) Therefore, training products cannot be completely suitable for each enterprise. On the other hand, the demand for human resources of enterprises is also not stable, is not regularly, accurately assessed each year, each period following field, position,... It is difficult for TNUT to scientifically and accurately determine the annual enrollment scale of each discipline or major as well as determine the outcome standard and training program that is really suitable with the reality.

The seventh, the content of training and research in TNUT has not completely ensured progress, modernity, ahead of enterprises, lack of investment in scientific playgrounds associated with research about technical problems in enterprises; many lecturers have not yet responded to the rapid technological changes in enterprises; many subject projects and graduation projects have been renewed slowly, not yet associated with practice, heavy in theory; teaching technology is outdated; many lecturers lack motivation to innovate and update knowledge, technology,... Therefore, the effectiveness of training is still limited, the product has not met the needs of enterprises, especially enterprises do not really "rely on", "expect" on the effectiveness of cooperation with the university.

2.4 Solutions to improve the efficiency of cooperation between TNUT and enterprises

In order to improve the effectiveness of cooperation between TNUT and enterprises, TNUT should synchronously implement solutions including mechanisms, policies, personnel, activities,... The solutions that can be implemented include:

(1) Leaders of the university need to provide guidance documents and drastically implement solutions to improve cooperation efficiency with enterprises. The documents should clearly state the objectives, form, content, regulations, processes, responsibilities, working mechanism, remuneration policy and the way to ensure quality of relationship between TNUT and enterprises. These issues should be specified in the internal spending regulations, annual action programs and action plans of TNUT and specialized faculties. In particular, the remuneration for lecturers should be considered an important component.

(2) Expanding fields of cooperation with enterprises

- About training and fostering capacity

+ Organize for students to practice, experience with salary, and visit, participate in projects of enterprises

+ Invite TNUT's lecturers to train, foster expertise, transfer technology to the enterprise's staff (training according to the orders of the enterprise); training courses with short-term certificates in CAD, CNC, PLC, ...

+ Organize short-term training courses for lecturers on technology and equipment in enterprises.

+ Invite experts of enterprises to exchange expertise through professional meetings or teach theoretical topics or guide the practice for lecturers and students;

+ Implementing solutions linking recruitment with training such as "Commitment in Training - Recruitment": Students are received scholarships from enterprises, trained according to the needs of enterprises, practiced at enterprises to be convert the equivalent of practical modules in the training program, get internship for graduation and committed to recruiting upon graduation.

+ The lecturers innovate teaching methods, teaching forms to suit the development of practical capacity for the students: For example, the lecturers use teaching methods of practical situations, problem-raising teaching methods to solve situations of practical techniques.

+ The close connection between training - enterprise experience - recruitment can be introduced as a condition for recruiting university teachers or recruiting employees for enterprises. At that time, these

requirements force the universities, lecturers, and students to actively and actively build cooperation activities with enterprises and vice versa.

- About scientific research and technology transfer:

+ Enterprises invest in machinery and equipment at the universities or build laboratories, practice rooms, training rooms in enterprises to support the universities' training and scientific research process;

+ TNUT coordinates with enterprises to build technical problems from difficult practical problems in enterprises to do scientific research topics, subject projects, graduation projects, projects, and organize competitions about scientific creativity at TNUT.

+ TNUT builds up research groups including lecturers-staff of enterprise - research students - graduate students - students to specialize and cooperate in research activities.

- About the development of training curriculum:

+ Develop guiding documents for enterprises to participate directly in the construction, review and adjustment of the output standards and training programs in an favorable and effective way;

+ In addition to adjusting the training curriculum towards application, increasing the volume of practice, internship, and enterprise experience, it is necessary to arrange reasonable divergences to ensure feasibility of organizing training (ensure production plans in enterprises and study plans at TNUT in two main semesters and 1 summer semester of the school year).

For example, in the old training program of Machine Manufacturing Technology, the number of credits practicing in TNUT and the graduate internship at the enterprise is 13/126 credits (about 10% of the learning volume). Therefore, this amount of knowledge, skills and training environment will be far from reality. If the volume of practical learning and internship is adjusted to 24/150 credits (16%), beside the graduate internship module (05 credits) there is an additional 14 credits of internship experience in enterprise (practical topics in Machine Manufacturing Technology, enterprise experience and internship in Machining Technology). With that volume of 14 credits, students can be participated experience in enterprises in the whole semester, converted the learning volume according to the curriculum and comebacked effectively TNUT in the next semester to study.

- About the Center of Enterprise Cooperation

+ The Center should have a number of full-time staff. In addition, the center should arrange part-time staff who are organic staff of the school and contracted or part-time staff of enterprises for favorable cooperation activities. These are people who have a lot of experience, many relationships and reputation in society to easily create a deep and wide relationship network, to be able to collect information, build a database system, act as a focal point to organize events (conferences, seminars, exchange programs ...) to promote, introduce information and attract the participation of representatives of enterprises...

+ The Center needs to work closely with enterprises to organize and evaluate internship activities, experience, the quality of training products, assess the needs of human resources (quality, quantity, structure, ...) of enterprise to serve as a basis for enrollment activities, development of training program, and organization of training.

- + Build a network linking enterprises and universities in the same technical field or many fields (for example engineering - IT - Economics - ...) to solve specialized technical problems or general problems of enterprises.
- + Establish enterprises' representative offices at university to promptly build and develop cooperative relationships.

3. CONCLUSIONS

Cooperation between technical universities in general, TNUT in particular with enterprises is an inevitable activity to contribute to improving the quality of training, development of universities, enterprises and society.

For this activity to be highly effective, it is necessary to have close coordination between TNUT and enterprises through regulations, policies, cooperation minutes, especially the proactiveness, activeness and responsibility of the parties involved such as the leaders, lecturers, students, alumni of the university, the staff at enterprises in all activities such as training, retraining, scientific research, technology transfer, program development,...

When all stakeholders define this cooperation as a mission, responsibility, rights, and opportunity for the development of the university, of enterprises and society, this activity is more stable, sustainable and effective.

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