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THE THIRD MISSION OF UNIVERSITIES: CONSTRAINTS AND POLICY RECOMMENDATIONS FOR THE CASE OF VIETNAM

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ABSTRACT

This article researches current practices of several Vietnamese universities to fulfill their third mission. Analyzing results of major activities (such as technology transfer, research commercialization, and entrepreneurship) in 9 universities in the North of Vietnam from 2013 to 2018, the article identifies the limitations and suggests a number of governance policies to support universities in fulfilling their third mission in Vietnam's current context.

Keywords: Third Mission, University, Entrepreneurial University, Technology Transfer, Commercialization.

INTRODUCTION

The world has seen a dramatic shift from the traditional model to an entrepreneurial university model over the past three decades. Associated with this transformation is the promotion of technology transfer and business startups, also known as the third mission of universities. These activities are the premise for the formation of academic entrepreneurs, implementing commercialization activities, which strengthen and develop the relationship between

universities and businesses sustainably through efficient financial activities and attractiveness to stakeholders and investors (Dinh, 2020a).

Since the second decade of the 21st century, when economies entered the digital era which introduces advantages of the 4.0 revolution, the role of universities has become more and more important. Universities became centers of applied research and have to fulfill their third mission to promote socio-economic development (Nguyen & Nguyen, 2020). However, the performance of universities in Vietnam until this moment was still limited due to internal and external factors from the institutional environment (Dinh, 2020b). Therefore, identifying difficulties and suggesting policies for regulatory agencies and universities has become an urgent need.

This paper is structured as follows: Section 1 introduces the topic. Section 2 presents the theoretical and practical background. Section 3 explains the research methods. Section 4 analyzes the current practices at Vietnamese universities to fulfill the third mission. Section 5 proposes some university governance policies. Lastly, section 6 concludes the paper.

THEORETICAL AND PRACTICAL BACKGROUND

The third mission of universities is also known as “outreach” in former English-speaking countries or “third flow” in Europe (Boffo & Cocorullo, 2019). The connotation and ways to carry out this mission are discussed in most researches about entrepreneurship in universities. These also are activities connecting scientific research to transferring and commercializing research results with industries within universities (Shore & McLauchlan, 2012). Accordingly, universities and members of such universities conduct technology research and development (R&D), knowledge transfer (including providing on-demand learning or consulting services), and commercialization of R&D results. A series of activities to execute the third mission is divided into three groups: i.) Application-oriented scientific research and technology development (collectively referred to as scientific research); ii.) promoting technology transfer with the aim of commercialization, and iii.) promoting commercialization and enterprise development (Dinh, 2020a).

Scientific Research Towards Application And Transfer

Carrying out the third mission, universities need to improve their research capacity to have more products that can be applied to production and business, and at the same time strengthen links with other parties (investors, enterprises, the State) in researching to transfer to commercial production. These activities are listed in Table 1.

Table 1

Technology Research and Development to Carry out Universities' Third Mission

No.	Activities
1	Building universities into centers of research and application; Establishing excellent research centers, key research clusters, and laboratories
2	Promoting collaborative projects and business contracts in research, application, and transfer
3	Increasing researches that are close to in-demand fields and technologies
4	Shortening research time and taking measures to minimize risks in test production

The activities mentioned above can be considered as distinctive features in entrepreneurial universities compared to traditional universities. In traditional universities, scientific research is mainly basic research or topics ordered by the State, not tied to the market. In entrepreneurial universities, enterprises and industries actively seek to form research projects and apply them to practical production and business (Dinh, 2020b). In fact, for the past few

decades, most prestigious universities in the world have shown that they are leading in R&D activities associated with enterprises. There is even competition among universities in developed countries in attracting resources and cooperating with businesses in scientific research (Dinh, 2017). An innovative system in the relationship among government - university - business under the Triple Helix model has been established in many countries. In this linkage model, each party has a specific role, but the general goal is to support and create conditions for universities and businesses to participate in R&D activities to get scientific research results that support transfer and commercialization. Around the world, most technological innovations that bring about economic efficiency have come from universities through knowledge-sharing activities, cooperating with application-oriented industries to serve the socio-economic demand (Isabelle, 2014; Dinh, 2020b).

Technology Transfer Towards Commercialization

Technology transfer is the process of transferring skills, knowledge, technology, production methods, product samples, so that the transferee can access, develop, exploit and supply back to the market. In essence, these are the activities that directly carry out the third mission of universities. In a knowledge-based economy, countries' competitiveness is increasingly dependent on the creation and application of scientific and technological knowledge, so technology transfer becomes more and more important to narrow the gap between academic research and commercialization (Festel, 2013). Universities need to carry out a wide range of activities from strategizing to formulating and implementing plans with clear objectives and internal policies for technology transfer. Activities have been implemented synchronously: from skill training, awareness-raising, and entrepreneurship for scientists, copyright and patent registration, supporting experimental production, product incubation, transferring and developing academic spin-off (see Table 2).

Table 2

Activities Promoting Transfer and Commercialization

No.	Activities
1	Developing strategies, policies, plans, and mechanisms for technology transfer (including registration of intellectual property, licensing); Building a database of R&D results and linking supply and demand
2	Training and improving entrepreneurship and business skills for lecturers and researchers
3	Implementing concession and transfer of R&D results
4	Establishing intermediaries, brokers: licensing offices, technology transfer offices (TTOs), incubators and venture capital funds to support business startups

To promote and support technology development activities, business idea creation - transfer - formation, and commercialization, specialized departments such as TTOs play a key role. Around the world, typically in the UK in the late 1990s, when TTOs were directly funded by the government through the Higher Education Innovation Fund in England and Wales (Rigby and Ramlogan, 2012), TTOs were the decisive factor in the invention of spin-off and spin-out companies. In China, most TTOs, known as "technomarts", operate as private companies affiliated with universities and carry out business development services and support investment in forming businesses. In addition, incubators aiming to provide locations and environments for business formation in universities are also very popular and considered as an economic development tool because they are involved in the early stages of the life cycle of a business project (Isabelle, 2014).

Commercialization and Entrepreneurship

Technology transfer is not the final destination of an entrepreneurial university. The ultimate goal is that knowledge and research results are applied to benefit all parties (universities, investors, scientists, and enterprises) to contribute to socio-economic development. Commercialization requires the participation of scientists but needs promotion and support activities of the university. Based on inductive research, Ndonzuau et al. (2002) proposed a model to convert research results from universities to create economic value in four phases (see Table 3).

Table 3

Universities' Commercialization Activities

No.	Stage	Objectives and Activities
1	Generating ideas	Choose research projects or business ideas for commercial purposes.
2	Finalizing new venture projects	Polish business ideas and form venture projects.
3	Launching projects	Finalize products & promote commercialization; Improve performance efficiency of TTO and incubator; Support business establishment.
4	Strengthening the creation of economic value	Increase production capacity and business efficiency in enterprises

In the above process, new ideas obtained from research and their potential for business are always evaluated, then further evaluated, selected, and realized to create economic values. Therefore, according to Ndonzuau et al. (2002), in essence, this is a process of pricing researches and ideas to commercialize through spin-offs. This is considered as a significant mechanism in the university-enterprise relationship to create jobs and resources, and at the same time, promote restructuring to maximize the impact of research through technology transfer (Boffo & Cocorullo, 2019). Studies have also shown that the process of forming and developing spin-offs is closely linked to technology transfer from universities (Saetre et al., 2009; Dinh, 2021). Besides being a bridge to attract capital for business projects, these businesses are also a path for ideas and technologies from scientists to be commercially exploited to the market in the fastest way (Callan, 2001; Saetre et al., 2009; Dinh, 2020b).

RESEARCH METHODS

This study uses the theoretical framework of the three groups of activities presented in Section 2 above to review the performance of 9 universities in Northern Vietnam during 2013-2018 and analyze in-depth the causes of limitation. These universities have completed the Education Quality Accreditation in accordance with the national accreditation standards and are assessed by VNU-Center for Education Accreditation (VNU-CEA) - an independent accreditation agency in 2017 and 2018. Among them, seven are public universities (Foreign Trade University, National Economics University, Vinh University, Water Resources University (now is Thuyloi University), Vietnam National University of Forestry, Hanoi University of Mining and Geology, Hanoi Open University). The two non-public ones are Hoa Binh University and Thang Long University.

This research examined the results of carrying out the third mission of these universities by three groups of activities through secondary data: self-assessment reports of these universities (kept at VNU-CEA) and the external assessment results by the VNU-CEA Accreditation Council. After evaluation, three universities with the best scientific research results and

potential for technology transfer were selected to analyze the limitations and causes of these limitations in implementation. Analysis was conducted on the results of 5 semi-structured interviews with managers and leaders of 3 public technical universities: Water Resources University, Vietnam National University of Forestry, Hanoi University of Mining and Geology. Five scientists who also are leaders and managers participated in the interviews, including 1 from Vietnam National University of Forestry (Vice Rector); 2 from Water Resources University (Dean of Economics & Business Administration and Vice Rector); 2 from Hanoi University of Mining and Geology (Director of CODECO and Vice Rector).

RESEARCH RESULTS AND DISCUSSIONS

Current Practices of Vietnamese Universities to Fulfill the Third Mission

Results at nine universities in the 5-year cycle of 2013-2018 show that: all universities have low self-assessment in the criteria of policy, management, and implementation of scientific researching and transferring. The assessors' results also showed that the criteria in this field were always assessed lower than the criteria of education and facilities assurance. More specifically, universities in the economic group such as Foreign Trade University, National Economics University have published many scientific research activities, but the results of technology transfer and commercialization are negligible; Hanoi Open University, Vinh University, and two non-public universities have minimal results in technology research and development, and there are no transferred or commercialized contracts of significant economic values. Three universities of the technical group: Water Resources University, Vietnam National University of Forestry, Hanoi University of Mining and Geology, have outstanding scientific research and technological development results compared to the above universities, but the transfer and commercialization are still modest (with average annual revenue less than 5% of total revenue).

In terms of entrepreneurship and business development, the researched universities do not have academic spin-offs formed from research or from staff and lecturers. This result is consistent with previously published research (Dinh, 2019, 2020a, 2020b). Among these, two universities, namely Water Resources University and Hanoi University of Mining and Geology, have affiliated companies: Consulting and Technology Transfer Co., Ltd. (from Water Resources University) was established in 2015 on the basis of changing from a state-owned enterprise with most capital contribution (75%) coming from university staff; Consultancy, Technology Deployment and Construction in Mining and Geology Co. Ltd. was transformed from a state-owned enterprise in 2014 under the managing ministry (Ministry of Education and Training).

In the evaluation process of the Accreditation Council, recommendations made in the Council's resolutions are necessary improvements on the basis of the weaknesses outlined in the reports of universities and their independent assessors. Therefore, the following recommendations, summarized comprehensively, reflect the main shortcomings and limitations that all 9 studied universities need to overcome to meet the requirements of stakeholders in order to carry out their third mission.

For scientific research and technology development, universities need to: 1) formulate a technology research and development strategy; 2) establish strong research groups to bring into play the science and technology potential of lecturers in fields where said university is

good at; 3) increase the number of contracts and scientific research topics ordered by organizations and businesses.

For technology transfer activities towards commercialization: 1) research and application-oriented technology development should be given priority; 2) the issuing of patent registration should be addressed; 3) policies and solutions to promote technology transfer to increase revenues from scientific research and transfer activities should be developed.

For the transfer and commercialization of research results: 1) prioritize the improvement of research products and developed technologies to meet market's demand; 2) find solutions that promote innovation, creativity, and entrepreneurship among faculty and learners; 3) strengthen cooperation with businesses and entrepreneurial activities to promote transfer, trial production and commercialization to increase sustainable revenues.

Shortcomings of Universities In Fulfilling The Third Mission

Results of in-depth interviews with five managers and experts (including three university leaders, one business director and one faculty leader) at three public universities with the best scientific research results showed the difficulties, problems, and the main causes are discussed below.

Technology Research and Development

Survey results show that there are three universities that have used the state budget to invest in key laboratories, namely Water Resources University, Vietnam National University of Forestry, Hanoi University of Mining and Geology. However, the goal of building the university to become an application-oriented research center with excellent centers, research clusters or science parks, has not yet been met by these universities. For the remaining universities, the results of research and development are not significant, and there are no research/laboratory rooms to meet the requirements of scientific research. All 9 universities do not have research cooperation contracts or outsource technology development orders that bring significant revenue. The main reasons for these limitations are:

- Regarding the organizational structure, universities are under the management of their managing ministry and have not yet had the autonomy to establish new units and organizations;
- Universities, scientists, managers do not pay attention to the issue of copyrights and patents;
- Scientists and units in the university have not actively approached businesses and manufacturers due to a lack of motivation;
- The university has not had a strong enough incentive mechanism and policy for units and lecturers to want to approach investors and enterprises. In fact, most studies receive funding mainly from the state budget (central and local) through assigning tasks, placing orders or bidding.

Technology Transfer

Very few products from universities can be transferred to businesses towards commercialization. For the three technical universities mentioned above, the revenue from transfer is negligible (1-3% of the total revenue in 5 years), in which the revenues of Water Resources University, Hanoi University of Mining and Geology are mainly from consultation contracts. Difficulties in promoting technology transfer activities are caused mainly by:

- The State and universities do not have strong incentives or sanctions that require scientists and project managers to actively explore and promote transfer to businesses and parties in need of research results;
- Regulations and procedures for licensing of technology transfer in these universities have not been issued to apply in practice;
- Scientists and units are only interested in completing assigned tasks and their research publications. They are not interested in technology transfer due to a lack of rights and responsibilities.

Commercialization and Business Development

The aforementioned universities have not built an ecology for innovation activities. First of all, the organizational structure and governance model have yet aimed at promoting and creating an entrepreneurial ecosystem. Instead, the universities are being managed in a hierarchical, administrative manner. Accordingly, the university prioritizes compliance with the Ministry of Education and Training and the managing ministry (for public universities) or the local government (for non-public universities). There is also no innovation network outside of university due to the lack of a comprehensive legal and institutional system for an entrepreneurship ecosystem (Dinh, 2020).

In addition, there are many problems for the formation and operation of businesses in these universities, namely:

- The Law on Enterprises, the Law on Anti-Corruption, and the Law on Public Employees do not allow scientists and lecturers in public universities to establish and participate in the management of enterprises;
- Leaders of universities still have the desire to control and direct businesses if formed from universities;
- Startups or spin-offs struggle at the beginning because they do not have access to supporting capital and contributed capital sources, while commercial loans from banks are not feasible;
- Conflicts over the mechanism of using assets, capital resources, and land use rights, as there is no legal guidance for contributions from public resources to university spin-offs.

In particular, when asked, university leaders admitted that there are almost no business startups initiated by leaders, lecturers, and staff. The reason is that the teaching mission of the lecturers still overwhelms creative ideas and entrepreneurship spirit (Dinh, 2020a).

SUGGESTIONS FOR UNIVERSITY GOVERNANCE POLICIES

The reasons discussed above can be divided into main groups of factors that have different levels of influence on the implementation of the third mission in Vietnamese universities (Dinh Van Toan, 2020b). Official institutional factors, external market structural factors, intellectual property laws, etc. need institutional synchronization from the State and government. The remaining group of factors (namely policies, regulations, governance structure of managing ministries and universities) has a direct impact on the implementation of the third mission.

From the above research results and discussions, to formulate and select policies from stakeholders and universities with the premise of transforming the current university model in Vietnam, it is necessary to pay attention to the following issues.

The laws, policies and regulations should be built and completed in a synchronous manner to:

- Promote application-oriented scientific research and technology transfer towards commercialization of research results from universities. To do so, the legal system needs to allow universities to own and fully use the ownership rights to intellectual property from research products of the universities, including those funded by the State; loosen and simplify procedures for buying, selling, and transferring technology transfer rights for universities;

- Establish an effective coordination mechanism in the Triple Helix model of innovation between academia, industry, and government; formulate policies to support businesses in order to exploit universities' research results;

- Remove barriers to establish and operate academic spin-offs founded and managed by affiliates or individuals within universities.

Management policy and mechanism of the governing bodies of public universities and investors of non-public universities should be improved with the aim of:

- Removing administrative management mechanisms so that universities have autonomy in deciding their own structure, management apparatus and forming supporting departments: trial production, technology transfer, entrepreneurship and business incubation;

- Allowing and guiding public universities on public property assessment, branding and capital contribution in business activities, commercialization and establishment of businesses.

Policies, governance structures and internal policies and mechanisms in universities need to be renewed and perfected so that:

- Universities become centers of applied research, technology transfer and facilitate collaboration between universities and industries to promote commercialization of research and technology development results;

- The mechanism to register, establish ownership and exploitation and distribution rights of intellectual property of research projects should be concretized and easy to do;

- The reward and recognition system should be geared towards entrepreneurial culture and the academic community's positive attitude towards entrepreneurship. To do so, in addition to material and spiritual rewards, it is necessary to show recognition in par with each individual's dedication to transfer and commercialization in universities.

CONCLUSION

The research results show that there are still challenges that need to be overcome for universities in Vietnam to fulfill their third mission. Firstly, the institution is not synchronous, has not promoted and nurtured innovation, creativity, and entrepreneurship activities. Meanwhile, the resources and capacity of research and development associated with technology transfer in universities are still limited. There is a delay in state management reform, university governance towards promoting autonomy, and transition to entrepreneurial universities. This is also the main cause leading to limitations in the implementation results of universities.

In order to promote activities to implement universities' third mission, in addition to the intrinsic factors of universities, it is necessary to have synchronous institutions to remove management barriers so that universities can strengthen autonomy capacities, innovate organizational models and governance towards entrepreneurial universities. For universities, it

is necessary to develop internal mechanisms and policies to encourage entrepreneurship, connect stakeholders, and promote commercialization.

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Conflicts of Interests

No conflict of interest has been declared by the author.