

SCIENTIFIC RESEARCH INFLUENCING THE QUALITY OF TRAINING: A CASE OF PUBLIC UNIVERSITIES IN HO CHI MINH CITY

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ABSTRACT

In the current context of globalization and deep integration, scientific research plays a particularly important role in the quality of training at public universities. Besides, scientific research always receives individual attention from public universities. Therefore, the main objective of this paper is to find out factors that influencing the quality of training at the public universities in Ho Chi Minh City (HCMC). The authors surveyed 900 lecturers who are working at nine public universities in HCMC, and each university has 100 lecturers surveyed. The authors applied a random sampling technique. Cronbach's Alpha tested, the exploratory factor analysis and Structural Equation Modelling (SEM) tested also. The title had been used items on a 5-point Likert scale. Results showed scientific research factors influencing the quality of training at the public universities in HCMC with significant at 1.0 percent.

Keywords: Training, Quality, Public, Universities, HCMC.

INTRODUCTION

Nowadays, a university has two main tasks, and the most important is training and scientific research. These are two activities that have an organic relationship, two basic strategic tasks of the university. The active participation of faculty members in scientific research activities is one of the critical measures, mandatory, necessary to aim to improve the quality of training, and it is better to meet the increasingly demanding needs of society (Aagnaia, 2017). A destination for universities is not an enrollment nor a training process. The destination must be output as directed by the Minister of Education and Training, and it must be the quality of training following the social needs and the rate of graduates having jobs. Many factors are influencing the quality of training at public universities such as Financial policy, research motivation, Research capacity, Research environment, and especially scientific research (Bramley & Kitson, 2013). Besides, scientific research also plays a significant role in improving the quality of training at public universities in the current period (Abu-Arqoub, 2008).

The public universities have a strategic position in the cause of industrialization and modernization of the country. Besides, scientific research needs to apply projects that have made significant contributions to socio-economic development. This factor is an essential foundation for building new science areas in line with the guidelines of the Party and the State. Despite these encouraging achievements, the research and application of research results into practice had some limitations. Individually, scientific research projects have not met the needs of socio-economic development, both quantity, and quality. How are public universities to stimulate

young lecturers to pursue scientific research and improve the quality of scientific research in the environment of public universities? This factor helps public universities enhancing the training quality in the future. Above mentioned things, the main objective of this paper is to find out scientific research factors that are influencing the quality of training at the public universities in HCMC.

LITERATURE REVIEW

Scientific Research (SR)

Scientific research is an activity of searching, reviewing, investigating, or experimenting. Based on data, documents, knowledge gained from scientific research experiments to discover new things about the nature of things, about the natural and social world. This factor is to create methods, new methods, new technical facilities higher, more valuable (Aгнаia, 2017). Besides, scientific research relies on the application of scientific methods to discover new things about the nature of things and material things. This type of research provides information and scientific theory that explains the nature and the social (Herschbach, 2017). The results of scientific research create practical applications. Government agencies, social donor organizations, sponsor scientific research activities. Scientific research is a widely used criterion in assessing the status of academic institutions or universities (Al-Athari & Zairi, 2002). Thus, scientific research is an activity of exploring, examining, investigating, or testing, based on data, documents, and knowledge gained from experiments to discover new things about the nature of things.

Training Quality (TQ)

Currently, there are many different conceptions about the quality of training. The training quality assessed by the degree in which the training goal reached for a training program. The training quality is the result of the training process that reflected in the characteristics of the quality, personality value, and labor value or professional competence of graduates corresponding to the objectives and programs (Al-Khayyat & Elgamal, 2010). The quality of training is considered appropriate and meets the requirements of society. The training quality has two parts: the hardware is a trinity of knowledge, skills, and attitudes that learners learn during the training process. Software is creative and adaptive (Atiyyah, 2011). The quality of training today is not merely the level, the ability to study and train at the university as assessed by the scores of the exams, but more importantly by the actual results and by effectively using the qualities and competencies of students in practical activities at university, home, and society.

Financial Policy (FP)

Financial policy is one of the groups of factors that play a significant role in the research and application of research results (Bates & Davis, 2010). The speed of a project/project's completion depends on this group of factors. It relates to the procedures for estimating, allocating funds, and paying for project implementation. However, it depends on each topic and project (Carter, 2012). The stages that implemented from the time of estimation, funding to payment procedures are evaluated differently from scientists and the importance of this policy element (Dahiya, 2018). Therefore, the following hypothesis built.

Hypothesis H1: Financial policy influencing scientific research at public universities in HCMC.

Hypothesis H2: Financial policy influencing the quality of training at public universities in HCMC.

Research Motivation (RM)

Scientists' motivations are to participate in scientific research that evaluated through many criteria. Besides, the goal improved professional qualifications and developing research capacity, passion, income sources, and reputation enhancement, which are assessed very differently through scientific authors (Chiaburu & Tekleab, 2015). The importance of research motivation of scientists showed that the majority of the importance of scientific research is to improve their professional qualifications, and research capacity contributed to the training quality (Cromwell & Kolb, 2014). The primary motivation influencing scientific research is knowledge, science, career, while other motivations are secondary such as income, assignments, emulation, or mandatory job. Therefore, the following hypothesis built.

Hypothesis H3: Research motivation influencing scientific research at public universities in HCMC.

Hypothesis H4: Research motivation influencing the quality of training at public universities in HCMC.

Research Capacity (RC)

Research capacity has not only the right research motivation but also an excellent scientific research capacity that is required (Bartlett, 2017). Scientific research capacity is the ability to create, discover new knowledge, new technologies, and provide effective and practical solutions. Therefore, this criterion considered as a foundation to promote scientific research and the importance of criteria (Elangovan & Karakosky, 2014). The research capacity of the scientist includes many factors such as professional competence, experience, research skills, computer skills, foreign languages, and at the same time take on other tasks (Cromwell & Kolb, 2014). According to the results of statistical processing showing that the level of professional competence and experience, research skills are two essential factors that met to serve the research and deployment of application results. Therefore, the following hypothesis built.

Hypothesis H5: Research capacity influencing scientific research at public universities in HCMC.

Hypothesis H6: Research capacity influencing the quality of training at public universities in HCMC.

Research Environment (RE)

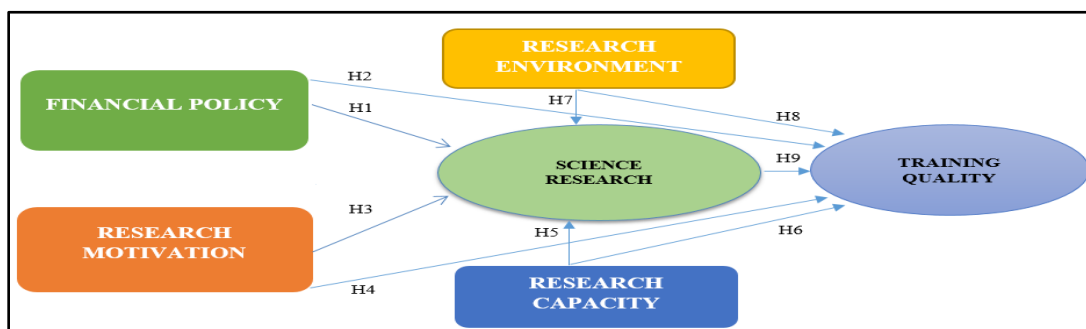
Research environment, including facilities and working environment, are considered as motivational factors for conducting research projects (Elbadri, 2017). Full facilities need to meet for authors on documents, databases, equipment, and laboratories, working rooms. And attention, support, coordination of stakeholders, including leaders, managers, governing bodies, research collaborators, and citizens who accelerate the research and implementation of scientific research results quickly (Carter, 2012). Besides, documents and databases provide information sources to collect and replicate application models of research results (Atiyah, 2011). We have the coordination of unit leaders, colleagues, and people are always significant by scientists because these are the supportive actors, providing information and the subject of applying the scientific

research results serving the development of new areas (Bramley & Kitson, 2013). Therefore, the following hypothesis built (Figure 1).

Hypothesis H7: Research environment influencing scientific research at public universities in HCMC.

Hypothesis H8: Research environment influencing the quality of training at public universities in HCMC.

Hypothesis H9: Scientific research has a positive impact on the quality of training at public universities in HCMC.



(Source: Authors proposed)

FIGURE 1
FACTORS INFLUENCING THE QUALITY OF TRAINING AT PUBLIC UNIVERSITIES IN HCMC

METHODS OF RESEARCH

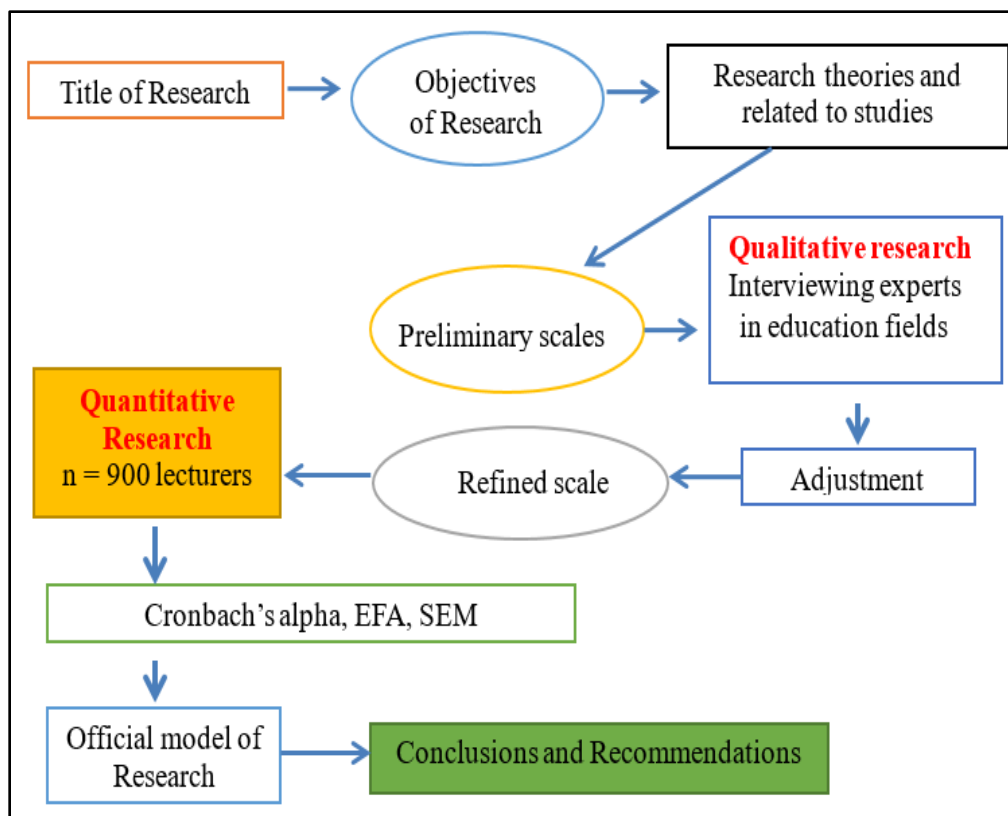
In this paper, the authors used a combination of two research methods—qualitative and quantitative research methods (Figure 2). The two research methods summarized in the 11 most basic research stages. Factors influencing the quality of training at public universities in HCMC that had many stages following:

Stage 1: Title of research: the authors had to identify the research title. The title is a factor that influencing the quality of training at public universities in HCMC. This study is usually chosen based on experience, accumulated knowledge, and practical needs of universities.

Stage 2: Objectives of research: the authors must find the objectives of the research. The study's goal is to test factors that influence the quality of training at public universities in HCMC. Based on testing, the authors proposed recommendations to improve training quality (Hair et al., 1998).

Stage 3: Research theories and related to studies: the authors have to find the research theories and related to studies. This stage helps the authors build a model of training quality.

Stage 4: Authors based on the mentioned theories and related to studies. The authors built preliminary scales and the preliminary model for factors influencing the quality of training at public universities in HCMC.



(Source: Authors proposed)

FIGURE 2
PROCESS FOR FACTORS INFLUENCING THE QUALITY OF TRAINING AT PUBLIC UNIVERSITIES IN HCMC

Stage 5: Qualitative research: interviewing experts in educational subjects. The authors did preliminary scales based on 40 experts' ideas about education and training to improve the scale and design of the surveying of questions. The authors asked 40 experts, and all of them had an agreement that all factors are influencing the quality of training at universities in HCMC.

Stage 6: The authors adjusted the research model. This stage helps the model be better (Hair et al., 1998).

Stage 7: The authors had an adjustment and refined scale by testing a reliability scale with Cronbach's Alpha coefficient and exploratory factor analysis. The authors surveyed 100 lecturers teaching for nine public universities in HCMC. This stage helps preliminary Data, and the research results improved the questionnaire for quantitative research (n=900 people) (Hair et al., 1998).

Stage 8: Quantitative research (n=900 lecturers): the authors continued to survey 900 lecturers. They are teaching many majors for nine public universities by questionnaires. Reliability scale with Cronbach's Alpha coefficient and exploratory factor analysis testing. Each university has 100 lecturers. There are 23 items and 845 lecturers answered, and data collected from May 2019 to January 2020 at nine public universities in HCMC.

Stage 9: Cronbach's alpha, EFA, SEM: the authors used a random sampling technique and spent 25 minutes for a survey. Reliability scale with Cronbach's Alpha coefficient and

exploratory factor analysis testing. Next, the authors had continued to confirmatory factor analysis (CFA). CFA showed to clarify: Chi-square testing is $P\text{-value} > 5$ percent; $\text{CMIN}/\text{df} \leq 2$, some cases CMIN/df maybe ≤ 3.0 or < 5.0 (Hair et al., 1998); GFI, TLI, CFI ≥ 0.9 . Besides, $\text{RMSEA} \leq 0.08$.

Stage 10: Official model of research: the authors tested the SEM model based on the results of stage 9.

Stage 11: Conclusions and recommendations: the authors analyzed research Data and proposed management policies to enhance the quality of training at public universities in HCMC.

RESEARCH RESULTS

The authors proposed the research results of the scale reliability testing for factors influencing the quality of training at public universities in HCMC.

Table 1 had 23 variables surveyed, and all of Cronbach's Alpha is more significant than 0.6. It makes Data eligible for the survey variables after testing scale. Above table Data was suitable and reliable for the next processing step. 23 variables divided into six components, such as Cronbach's Alpha for financial policy (FP), research motivation (RM), research capacity (RC), research environment (RE), scientific research (SR), and training quality (TQ) are higher 6.0.

Table 2 had the extraction sums of squared loadings of cumulative with 83.438%, and the index of initial eigenvalues is 1.338. The above result is suitable for KMO and Bartlett's testing.

Table 3 had a KMO coefficient of 0.831 and the level of significance with 0.000. The above results divided into six components. The variance coefficient is 83.438%, and the level of significance is 0.000.

Table 4 had all of the hypothesis accepted. Therefore, the objective of this study is to identify factors influencing the quality of training at public universities in HCMC. The theoretical model built on the specific basis of the quality of training at public universities in HCMC including the following components: Financial policy (FP), research motivation (RM), research capacity (RC), research environment (RE), scientific research (SR). Besides, table 4 showed that column "P" < 0.01 with significance level 0.01 and column "Conclusion" following:

Hypothesis H1 accepted: Financial policy significantly influencing scientific research of public universities in HCMC with significant at 1.0 percent.

Hypothesis H2 accepted: Financial policy significantly influencing the quality of training at public universities in HCMC with significant at 1.0 percent.

Hypothesis H3 accepted: Research motivation significantly influencing scientific research of public universities in HCMC at 0.01 percent.

Hypothesis H4 accepted: Research motivation influencing the quality of training at public universities in HCMC with significant at 1.0 percent.

Hypothesis H5 accepted: Research capacity influencing scientific research of public universities in HCMC with significant at 1.0 percent.

Hypothesis H6 accepted: Research capacity influencing the quality of training at public universities in HCMC with significant at 1.0 percent.

Hypothesis H7 accepted: Research environment influencing scientific research of public universities in HCMC with significant at 1.0 percent.

Hypothesis H8 accepted: Research environment influencing the quality of training at public universities in HCMC with significant at 1.0 percent.

Hypothesis H9 accepted: Scientific research influencing the quality of training at public universities in HCMC with significant at 1.0 percent.

Table 1		
THE SCALE RELIABILITY TESTS FOR FACTORS INFLUENCING THE QUALITY OF TRAINING AT PUBLIC UNIVERSITIES IN HCMC		
Items	Content	Cronbach's Alpha if Item Deleted
FP1	Procedures for making funding estimates for the implementation of a project	0.928
FP2	The rationality of the spending norms for the content of the project	0.952
FP3	The level of timeliness in funding for project implementation	0.951
FP4	Procedures for payment of funding for project implementation	0.932
Cronbach's Alpha for financial policy (FP)		0.955
RM1	Scientific research is a mandatory task and passionate	0.800
RM2	Scientific research is for training purposes and consideration of commendation	0.809
RM3	Scientific research is to increase income	0.848
RM4	Scientific research is to improve the qualification and research ability	0.797
Cronbach's Alpha for research motivation (RM)		0.853
RC1	Professional qualifications and capacity of scientists	0.933
RC2	Experience and research skills of scientists	0.945
RC3	Computing and foreign language skills of scientists	0.944
RC4	Another workload of the scientist	0.930
Cronbach's Alpha for research capacity (RC)		0.953
RE1	Documents and databases for scientific research	0.941
RE2	Equipment for scientific research	0.956
RE3	The workplace serves for scientific research and collaboration of colleagues	0.950
RE4	The attention and support of unit leaders for scientific research	0.936
Cronbach's Alpha for the research environment (RE)		0.959
SR1	Research environment impacting on scientific research of public universities in HCMC	0.940
SR2	Research capacity and motivation impacting on scientific research of public universities in HCMC	0.893
SR3	Financial policy impacting on scientific research of public universities in HCMC	0.939
Cronbach's Alpha for scientific research (SR)		0.948
TQ1	Research environment impacting on the quality of training at public universities in HCMC	0.871
TQ2	Research capacity and motivation impacting on the quality of training at public universities in HCMC	0.816
TQ3	Financial policy impacting on the quality of training at public universities in HCMC	0.869
TQ4	Scientific research impacting on the quality of training at public universities in HCMC	0.830
Cronbach's Alpha for training quality (TQ)		0.881
(Source: The authors' processing data and SPSS 20.0)		

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.572	28.575	28.575	6.572	28.575	28.575	5.010
2	3.894	16.933	45.508	3.894	16.933	45.508	3.905
3	3.369	14.648	60.155	3.369	14.648	60.155	3.607
4	2.366	10.289	70.444	2.366	10.289	70.444	4.621
5	1.650	7.175	77.620	1.650	7.175	77.620	2.997
6	1.338	5.818	83.438	1.338	5.818	83.438	4.568
7	.659	2.863	86.301				
...				
23	0.022	0.096	100.000				

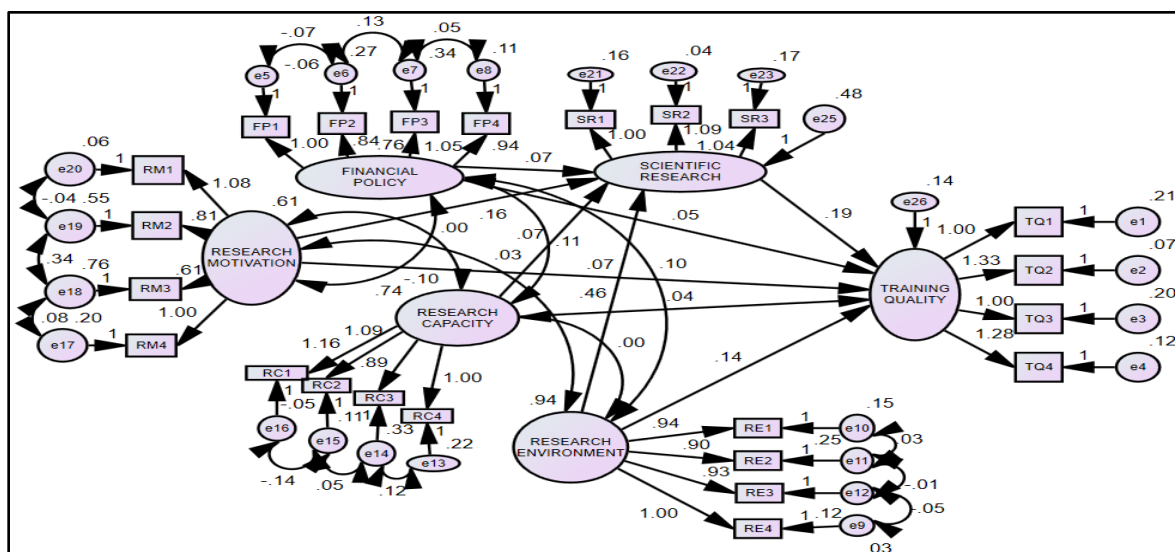
(Source: The authors' processing data and SPSS 20.0)

Code	Component					
	1	2	3	4	5	6
RE1	0.944					
RE2	0.939					
RE4	0.938					
RE3	0.885					
FP1		0.967				
FP4		0.965				
FP3		0.917				
FP2		0.903				
RC4			0.948			
RC1			0.938			
RC3			0.929			
RC2			0.929			
TQ4				0.908		
TQ2				0.867		
TQ1				0.849		
TQ3				0.790		
RM4					0.867	
RM1					0.864	
RM2					0.833	
RM3					0.776	
SR2						0.950
SR3						0.945
SR1						0.869

(Source: The authors' processing data and SPSS 20.0)

Relationships of components		Unstandardized Coefficient	Standardized Coefficient	C.R.	P	Conclusion
Scientific research	← Research capacity	0.071	0.072	2.627	0.009	H5: Accepted
Scientific research	← Research environment	0.462	0.531	16.354	***	H7: Accepted
Scientific research	← Research motivation	0.165	0.151	4.997	***	H3: Accepted
Scientific research	← Financial policy	0.073	0.088	3.171	0.002	H1: Accepted
Training quality	← Scientific research	0.186	0.336	8.593	***	H9: Accepted
Training quality	← Research motivation	0.066	0.110	3.439	***	H4: Accepted
Training quality	← Research capacity	0.044	0.080	2.680	0.007	H6: Accepted
Training quality	← Financial policy	0.049	0.107	3.507	***	H2: Accepted
Training quality	← Research environment	0.142	0.295	7.841	***	H8: Accepted

This showed that five factors influencing the quality of training at public universities in HCMC with significance level 0.01. Besides, Chi-square=963.211; df=203; p=0.000; Chi-square/df=4.745; GFI=0.915; TLI=0.953; CFI=0.962; RMSEA=0.067 (Figure 3).



(Source: The authors' processing data and Amos)

FIGURE 3
THE STRUCTURAL MODEL TESTING THE STRUCTURAL LINKAGE BETWEEN COMPONENTS

CONCLUSIONS AND MANAGERIAL IMPLICATIONS

Conclusions

Scientific research identified four factors, and it is a vital role in the process of improving the quality of training at public universities in HCMC with significant at 1.0 percent. This study has a basis for proposing recommendations to promote scientific research and application activities for enhancing the training quality. This study surveyed 900 (845 samples processed) lecturers who had carried out presenting projects in public universities in HCMC. The research results showed that regulations related to financial policy (FP), research motivation (RM), research capacity (RC), research environment (RE). Four factors are influencing scientific research and scientific research factor influencing the quality of training at public universities in HCMC with significant at 1.0 percent. Scientific research activities in universities are one of the essential and indispensable tasks of a team of scientists, lecturers. It is one of the main tasks and plays an essential role in raising the quality of training, contributing to the socio-economic development of the country. Based on the things as mentioned above, the authors had managerial implications following:

Managerial Implications

The managerial implication for the research environment ($\beta=0.295$) is the most substantial impact on the quality of training at public universities in HCMC, with significance at 1.0 percent. Public universities need to improve the scientific research environment: The research environment consists of two parts: hardware and software. For experimental scientists, the hardware is the laboratory with the equipment for research. Without the support of laboratories, it is difficult to achieve good research results. Compared with other world-class universities, many of the University's laboratories are not up to the standard. However, investment in upgrading existing laboratories as well as new investments requires massive funding to carry out step by step. It depends on the University's financial resources. Besides, theoretical authors like math, economics the hardware is mainly paper, pen, a decent library, and a computer well connected to the data warehouse via the internet.

The managerial implication for research motivation ($\beta = 0.110$) is the other impact on the quality of training at public universities in HCMC, with significance at 1.0 percent. Public universities need to create motivation for scientific research: Currently, the most difficult and most headache problem for public universities as well as private universities. It is a problem of the income of a young lecturer that is too low, much lower than income. This factor is making them unable to live on their salaries. Each month, they only receive a few million salaries if they are fortunate to have a project. The project settled once a year; they can hold money just to pay the amounts they have to pay in advance. Besides, the lecturers have to teach a lot to increase income, take care of money, and others, and on the other hand, they meet the needs of the universities and new departments that lack lecturers.

The managerial implication for financial policy ($\beta=0.107$) is the third impact on the quality of training at public universities in HCMC, with significance at 1.0 percent. Public universities need to pay attention to fiscal policy. Public universities must try to increase the income for lecturers with the financial policy that the amount of income increased depends on the research results. Lecturers who conduct quality research and have international publications must have a better income than lecturers who do not conduct research. That is why fairness and income gap in such a way create scientific research motivation for lecturers. Public universities need to

connect scientific research with doctoral training. It is an indispensable trend to improve the quality of science and technology activities as well as training high-quality human resources. Scientific research and ethnic minorities have a close relationship with each other.

The managerial implication for research capacity ($\beta=0.080$) is the least impact on the quality of training at public universities in HCMC, with significance at 1.0 percent. Public universities need to increase scientific research that organized in separate academic disciplines. But now, in advanced universities, scientific research is organized by issues rather than majors. Because the nature of the world is complex, these problems are often at the boundary of many sciences, its complexity goes beyond the scope of an individual industry, requiring the participation of a group, multidisciplinary and multi-field research. It is the science that determines the structure of the research group, not the subjective will of the research team. Public universities need to train scientific research skills and fostering activeness, independence, and creativity in play present, select, approach scientific issues, dare to enter to solve challenging, new, complex, and fearless problems fail. Finally, the following studies should apply probability sampling methods because it ensures a higher degree of representativeness and increases the size of the sample for more accurate analysis results. It helps data more significant and accurately.

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