Research on Factors Affecting Scientific Research Activities of Lecturers at Vietnam National University, Hanoi in the Context of University Autonomy

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Abstract: This research aims to assess the factors affecting the scientific research activities of lecturers currently working at Vietnam National University, Hanoi (VNU) in the context of university autonomy implementation. Despite several challenges in lecturers' scientific research activities (such as high pressure due to research requirements or lower research costs), university autonomy also creates certain advantages such as better research support policies or implementation of more academic autonomy policies. The research used partial least squares structural equation modelling (PLS-SEM) to analyse the collected data by assessing the measurement models and structural models. The research findings showed that the scientific research activities of VNU lecturers are affected by five factors, among which two factors, Scientific research experience and skills, and Scientific research motivation, have a direct influence in the same manner. The other three factors with indirect influence, in the same manner, included Procedures and funding for scientific research, Research collaboration, Attitude, and awareness of the importance of scientific research. Such research findings can act as references for VNU leaders in making and implementing science and technology development policies in line with the university's situation in the current period to further improve the efficiency of scientific research activities of its lecturers, contributing to the enhancement in the training quality and reputation of VNU.

Keywords: Scientific Research Activities, Influencing Factors, VNU, PLS-SEM, Research motivation.

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1 Introduction

In the context of globalisation and the development trend of the fourth industrial revolution, Vietnam's Communist Party and State have agreed that the country's development must be made by and based on science and technology and regarded the development of science and technology as the leading national policy amid the socio-economic development of the country. In terms of education in general, and higher education in particular, universities and research institutes are scholarly and academic institutions in charge of providing resources for the general development of the country through scientific research activities in the growing trend of university autonomy implementation, [1].

Scientific research not only makes an important contribution to the innovation and improvement of training quality but also helps to establish a university's reputation. When a university's reputation and accreditation improve, it can attract and enrol a large number of students; on such a basis, the university possibly receives a higher revenue for development, [2]. Scientific research activities are identified as one of the basic duties of university lecturers, especially in research-oriented universities with a high degree of autonomy like VNU, [3].

According to [4], the Ministry of Education and Training stipulates that "Lecturers are required to spend at least one-third of their total working time in the academic year, which is equivalent to 586 administrative hours, on carrying out scientific research tasks".

Numerous factors are motivating the implementation of scientific research, among which the human factor, or in other words the researchers, is the most important for obtaining a good scientific research project. Although lecturers are aware of the important role of scientific research in teaching and learning, the capacity to conduct scientific research of the majority of the lecturers at universities in Vietnam is generally limited. The question is what factors affect the scientific research activities of lecturers at higher education institutions. Many domestic and international researchers have been interested in finding the answer to the above problem and each research project discovered a group of factors that are not exactly the same because these studies were carried out at training institutions in different countries with different economic, social, and educational features.

To the best of the authors' knowledge up to the present, there have not been any researchers conducting research on this field to explore, identify and analyse factors affecting the scientific research activities of lecturers in VNU within the context of university autonomy implementation. In addition, the relationships between this context and the lecturers' scientific research activities have not been assessed by any researcher as well. Therefore, the authors of this research aimed to narrow this research gap.

This research used the PLS-SEM analysis technique to assess the factors affecting the scientific research activities of VNU lecturers. With the data collected from the sample survey and through processing and analysing the statistical data, this research was expected to provide university administrators with a deeper insight into the factors that can have an impact on the lecturer's scientific research activities, which helps them to obtain and provide appropriate orientations and policies to encourage lecturers to do scientific research.

2 Theoretical basis

2.1 Scientific Research

Research is an investigation to be performed in a rigorous and systematic way to discover previously unknown phenomena, develop theories, and apply them to interpret new situations and develop important intellectual foundations, [5].

According to [6] scientific research means the way that people systematically find out about scientific phenomena and the process of applying ideas and principles to find new knowledge to explain things and phenomena.

According to the Law on Science and Technology, scientific research refers to the activity of discovering, finding, and understanding the nature and laws of things, natural, social, and thinking phenomena, and creating solutions to apply in practice, [7].

According to Circular 15/2014/TT-BKHCN on June 13, 2014, by the Ministry of Science and Technology, scientific research findings are presented in the form of scientific reports, tapes, or disks including videos or audio and experimental artifacts. Scientific research findings are information to prove the nature of an event or phenomenon through the research process. Assessing scientific research findings is the assessment of any information included. These circulars point out that universities that organise any scientific and technological activity using the state budget or financed by the scientific and technological support fund under the law can

cooperate with scientific and technological organizations, manufacturing plants, domestic businesses, and foreign and international organisations. The universities are responsible for making and establishing the plan for annual scientific and technological research. They are allowed to publish and issue journals, magazines, scientific publications, coursebooks, and study materials for scientific and technological training. This is also considered a scientific and technological activity of the universities.

2.2 Scientific Research Activities of Lecturers

Any scholarly activity produced by a lecturer contributing to the creation of new knowledge or the laws of phenomena is regarded as a scientific research activity of lecturers, [8].

The scientific research activities of lecturers often include conducting scientific research on specific topics, publishing research works, creating useful inventions or products, compiling books and textbooks, and instructing students to do scientific research, [9].

Currently, scientific research in university training in Vietnam is considered an important "link" which contributes to the training quality improvement and provides the society with high human resources to satisfy the demands during international integration. Therefore, scientific research is considered the basic function and activity of a lecturer apart from teaching and training at the university.

According to [10] the active participation of lecturers in scientific research will bring such benefits to the lecturers themselves in particular, and to VNU and the society in general as follows.

(i) Scientific research helps lecturers acquire more professional knowledge;

(ii) Scientific research helps lecturers develop thinking, creative capacity, and ability to work independently, cultivate their knowledge and apply scientific cognitive methods;

(**iii)** Scientific research helps lecturers themselves update their information and knowledge effectively;

(iv) through scientific research, lecturers will obtain more understanding of their majors, contributing to the formation and fostering of professionalism for lecturers.;

(v) Scientific research is a good chance for lecturers to have an environment and opportunity to foster scientific research capacity. This is also a necessary basis for innovating the teaching contents and methods, contributing to training quality improvement;

(vi) Scientific research also creates a good opportunity for lecturers to assert themselves and follow their passion for discovering new knowledge;

(vii) The effectiveness of scientific research activities will make an important contribution to improving the prestige and status of the university in the country and around the world.

2.3 University Autonomy

University autonomy is a widely discussed topic in the world of education science and management and has received special attention from the public in recent years. University autonomy implementation is likely to facilitate universities to organise scientific research activities more effectively compared to that previously, [3].

Among the aspects of university autonomy (autonomy in organisation and personnel, finance and assets, and academics), academic autonomy which involves scientific research activities is regarded as one of the basic and important contents of a university. University is regarded as a place to create new knowledge. According to [3] the higher education system of Vietnam can be divided into five groups based on five levels of autonomy. In the case of VNU, this institution is assessed as being at the highest level of autonomy. The levels of state intervention were also measured and classified into five levels: strong intervention; fairly strong intervention, moderate intervention, little intervention, and no intervention. In addition, [3] also pointed out the law of university autonomy in Vietnam, which is the non-correlation (inverse correlation) between the level of state intervention and the level of autonomy of the universities. Besides, among the aspects of university autonomy, academic autonomy, especially the autonomy in lecturers' scientific research activities, is a major factor affecting the publication of scientific research findings, scientific staff, and strategic orientations for training (including objectives, contents, methods, and formats, etc.) and scientific research in universities.

2.4 The Importance of Research Productivity and Measuring Research Productivity

2.4.1 Research productivity indexes

Research productivity is the output of a research process or the findings of scientific research activities. It can be measured by various publications such as peer-reviewed journal

articles, theses, and books/chapters in books and patents, [11]. Research productivity can also be measured through reporting at research conferences and seminars; and the number of research funding schemes, [12]. Among the types of measurement of scientific research findings, the number of published scientific research works is commonly used as a measure to assess the research productivity of scholars and researchers around the world. Published scientific research works are extremely important because they are the main channel to publish intellectual products and disseminate knowledge to the public.

Currently, research productivity, especially the results of published scientific research works, is the most important criterion for ranking universities in the world in such ranking systems as Times Higher Education, QS World Ranking Universities, and Academic Ranking of World University. In general, research productivity is an important factor in determining the career development of researchers, and at the same time, enhancing the prestige and reputation of a university in Vietnam and around the world.

2.4.2 Measuring Research Productivity

It is possible to measure research productivity qualitatively or quantitatively. Whereas qualitative measurement assesses the influence or impacts of a published scientific work by taking into consideration the total number of references cited by researchers globally, quantitative measurement focuses on the number of published scientific research works by the researcher in a given period of time. The two measurements are used by various global ranking systems to rank universities annually.

The number of citations is an important figure reflecting the quality of a published scientific research work. There is a positive correlation between the number of citations of an article and its quality. Therefore, the citation index is the most prominent of the 13 currently used in Times Higher Education's annual assessment and ranking for research universities around the world. It is believed that based on the number of citations from publications by scientists, it is possible to predict who will win the Nobel Prize in certain fields, [13].

However, many researchers can contribute to a single article, which is a limitation of citation. In this case, it will not provide us with the creditworthiness of each author for such an article. Therefore, quantitative measures have been used more widely than qualitative ones to assess the research productivity of scholars and researchers at most universities around the world.

3 Research Method

3.1 Methods

This research used mixed research methods, or in other words, it combined quantitative and qualitative research methods in the steps of data collection and analysis. The research used partial least squares structural equation modelling (PLS-SEM) to analyse data by assessing the measurement models and structural models.

3.2 Research Model

The recommended research model is presented in Figure 1.

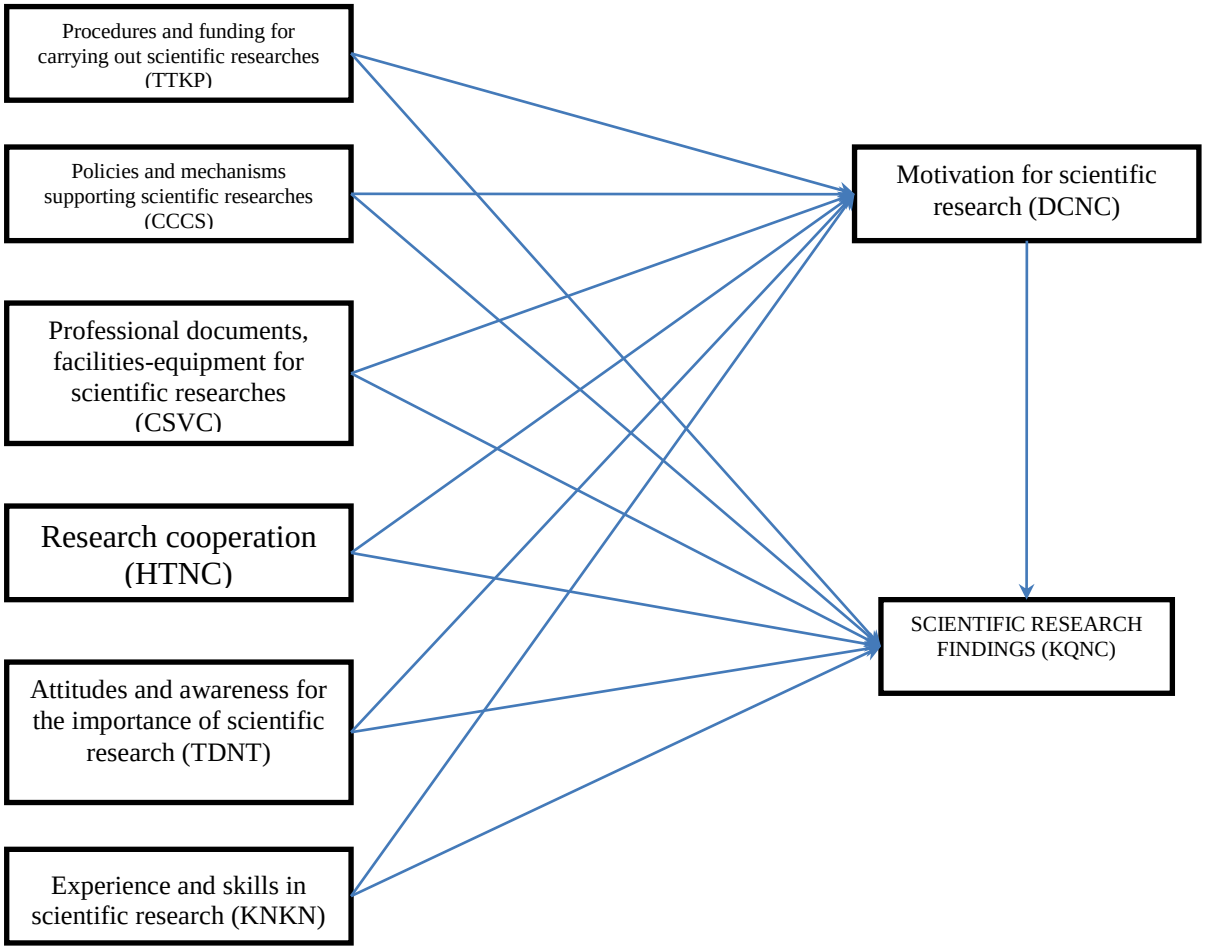

Fig. 1: Recommended research model

3.3 Research Sample

3.3.1 Qualitative Research Sample

Stage 1: Interview six lecturers to discover more factors affecting scientific research activities.

Stage 2: Interview eight experts and lecturers to calibrate the scale, and complete the questionnaire for preliminary quantitative assessment.

3.3.2. Quantitative research sample

When preparing a research model using structural equation modelling (SEM), the sample size is an important consideration, [14]. The sample size used in the structural equation modelling (SEM) has three types: small sample ≤ 100, medium sample 100-200, and large sample ≥ 200, [15].

The number to be considered valid for observation in this research was 219, which met the requirements of the analytical method.

3.4 Data Collection

The data was collected in two ways, which were administering the questionnaires in person and via the internet (via Email, Zalo, or Facebook).

3.5 Data Processing

The collected data was analysed using Smarts 3.3.9 software to test the model and the research hypotheses.

4 Research Findings

4.1 Testing the Measurement Model

4.1.1. Testing the Reliability and Convergent Validity of Factors

Reliability is a concept that refers to the accuracy or consistency of the scales. The reliability measurement indicators include individual item reliability and internal reliability (the degree of a close correlation between observed variables in the same scale). To be more specific, the individual item reliability is tested by the outer loading; Internal reliability (Internal consistency/local consistency) is determined by the Composite Reliability (CR) and Cronbach's alpha. According to [16], the outer loading of the observed variables should

be greater than or equal to 0.7; In addition, research data must ensure reliability when the Cronbach's Alpha and Composite Reliability (CR) are also greater than or equal to 0.7.

To assess the convergent validity of the scale, we relied on the average variance extracted (AVE). Such an index is defined as the mean sum of the squares of normalised load factors of the observed variables in a latent variable. A scale reaches convergence if the AVE is 0.5 or higher. Such a level of 0.5 (50%) means that the latent variable may explain at least 50% of the variation of each of its observed variables, [17].

The analysis of the results in Table 1 and Table 2 showed that the outer loading of all observed variables was greater than 0.7, meeting the testing standards. The model included seven groups of factors from N1-N7 as initially built by the authors (Figure 2). The Cronbach's Alpha and CR values of all scales were also greater than 0.7, indicating good reliability and internal consistency. The AVE value of each scale was greater than 0.5, indicating a good convergence value.

Table 1. Result of outer loading analysis

Observed variables	**Group of factors**						
	N1	**N2**	**N3**	**N4**	**N5**	**N6**	**N7**
Mechanisms and policies supporting scientific research							
CCCS2	0.855						
CCCS3	0.848						
CCCS6	0.838						
CCCS7	0.756						
CCCS9	0.809						
Professional documents, facilities-equipment serving scientific researches							
CSVC1		0.857					
CSVC2		0.883					
CSVC3		0.892					
CSVC4		0.899					
CSVC5		0.793					
Research collaboration							
HTNC1			0.801				
HTNC2			0.875				
HTNC3			0.916				
HTNC4			0.854				
HTNC5			0.800				
HTNC6			0.740				
HTNC7			0.795				
Experience and skills in scientific research							
KNKN1				0.895			
KNKN2				0.912			
KNKN3				0.920			
KNKN4				0.904			
Procedures and funding for carrying out scientific researches							
TTKP1					0.726		
TTKP2					0.839		
TTKP3					0.849		
TTKP4					0.870		

TTKP5					0.803		
Attitudes and awareness of the importance of scientific research							
TDNT1						0.796	
TDNT 2						0.869	
TDNT 3						0.934	
TDNT 4						0.943	
TDNT5						0.916	
Motivation for carrying out scientific research							
DCNC1							0.810
DCNC2							0.709
DCNC3							0.850
DCNC4							0.801
DCNC6							0.817

Table 2. Coefficients for determining the reliability and convergence of the analysed data

Symbol	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
CCCS	0.884	0.920	0.912	0.676
CSVC	0.917	0.934	0.937	0.750
HTNC	0.923	0.929	0.938	0.685
KNKN	0.929	0.929	0.949	0.824
TTKP	0.877	0.891	0.910	0.671
TDNT	0.937	0.949	0.952	0.798
DCNC	0.859	0.876	0.898	0.638

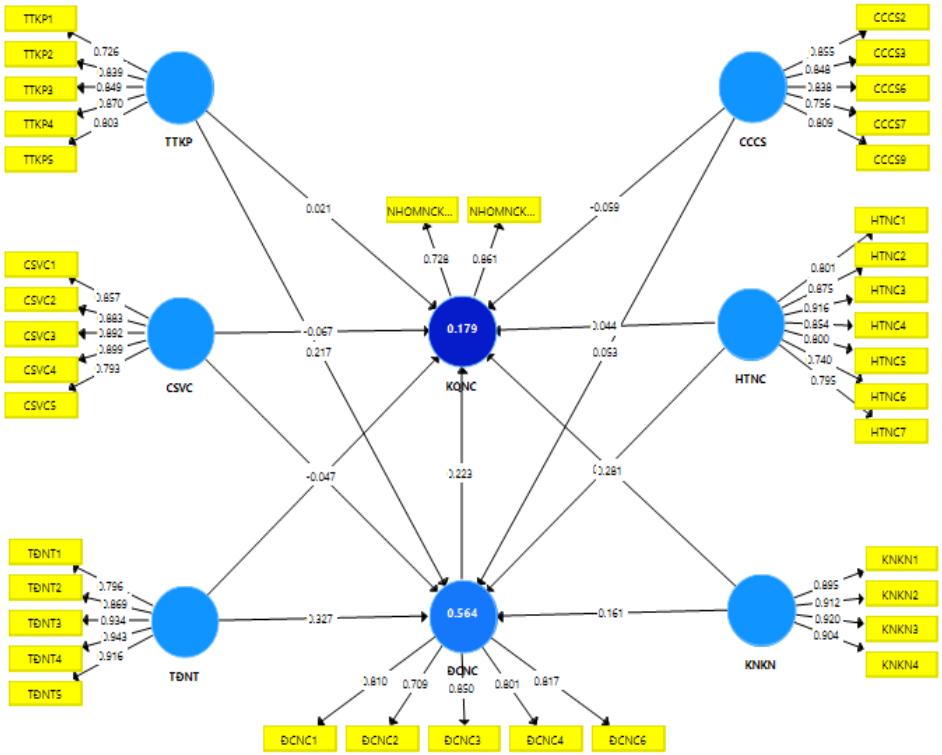

Fig. 2: Research model and data processing results

4.1.2 Testing the Discriminant Validity of Factors

Discriminant validity shows the level of difference of structures in the same model. The traditional approach to assess the discriminant validity of each scale is to use the square root of AVE. To be more specific, discriminant validity is guaranteed when the square root of AVE for each latent variable is higher than all correlations among the latent variables. In addition, discriminant validity can be assessed through the HTMT index and the threshold to assess the discriminant value HTMT ≤ 0.85.

The results in Table 3 showed that all square root values of AVE (the series of bolded values lying on the diagonal of the table) were larger than the corresponding correlation coefficient values in the matrix. In addition, all HTMT values were much smaller than the threshold of 0.85 (Table 4), which indicated that the model had good discriminant validity.

Table 3. Discriminant value according to the Fornell-Larcker criterion

Symbol	CCCS	CSVC	HTNC	KNKN	KQNC	TTKP	TDNT	DCNC
CCCS	**0.822**							
CSVC	0.558	**0.866**						
HTNC	0.346	0.470	**0.828**					
KNKN	0.178	0.231	0.483	**0.908**				
KQNC	0.049	0.065	0.254	0.380	**0.797**			
TTKP	0.503	0.580	0.344	0.303	0.137	**0.819**		
TDNT	0.412	0.254	0.386	0.406	0.170	0.133	**0.893**	
DCNC	0.400	0.356	0.613	0.521	0.331	0.408	0.559	**0.798**

Table 4. Heterotrait-monotrait (HTMT) discriminant value

Symbol	CCCS	CSVC	HTNC	KNKN	KQNC	TTKP	TDNT	DCNC
CCCS								
CSVC	0.635							
HTNC	0.379	0.511						
KNKN	0.171	0.248	0.520					
KQNC	0.172	0.116	0.380	0.591				
TTKP	0.560	0.653	0.387	0.321	0.210			
TDNT	0.461	0.272	0.397	0.416	0.239	0.145		
DCNC	0.428	0.392	0.667	0.565	0.525	0.463	0.581	

4.1.3 Testing the Multicollinearity Violation Assumption

To assess the phenomenon of multicollinearity between latent variables, the researchers used the Inner VIF Values coefficient in the Collinearity Statistics test (VIF). According to [18], if VIF is from 5 onwards, the model has a very high probability of appearing multicollinearity. The results in Table 5 illustrated that the VIF value of the factors in this research was all below 5, ranging from 1.504 to 2.295, therefore, multicollinearity did not appear in the research model.

Table 5. Variance Inflation Factor (VIF)

Symbol	KQNC	DCNC
CCCS	1.839	1.833
CSVC	1.963	1.945
HTNC	1.934	1.641
KNKN	1.570	1.511
TTKP	1.882	1.774
TDNT	1.750	1.504
DCNC	2.295	2.295

4.1.4 Coefficient of Determination R^2 and Bootstrapping Test

In the PLS-SEM analysis, the coefficient R^2 (coefficient of determination) and the structural path are used to assess the explanatory power or conformity of the model, [17]. R^2 value ranges from 0 to 1; The higher the R2, the stronger the relationship between independent and dependent variables, or in other words, the higher the R^2 value, the greater the explanatory level of independent variables in the model for dependent variables. According to [19], R-Square values are recommended at 0.67, 0.33, and 0.19, corresponding to the level of "strong", "medium" and "weak".

Table 6 showed that the model had an R^2 value of 17.9% for the variable KQNC and 56.4% for the variable DCNC. Thus, the independent variables DCNC and KNKN could explain 17.9% of the variation (variance) of the dependent variable KQNC. The independent variables KNKN, HTNC, TDNT, and TTKP could explain 56.4% of the variation of the dependent variable DCNC. The remaining was explained by other factors outside the model and random error. In addition, the statistical values T-Value greater than 1.96, and P-Value below 0.05 was completely consistent with the research model. These figures indicated that the significance of the research model was affirmed.

Table 6. Explanatory degree of independent variables for dependency (R^2)

	R Square	T Statistic	P Value
DCNC ->KQNC	0.179	2.587	0.010
KNKN -> DCNC		2.425	0.016
HTNC ->DCNC	0.564	5.450	0.000
KNKN->DCNC		2.425	0.016
TTKP ->DCNC		3.241	0.001
TDNT ->DCNC		4.498	0.000

4.2 Testing Hypotheses

In order to assess the impact relation among the variables in the SEM model, the Path Coefficients results of the Bootstrap analysis were used in the research.

The results of parameter estimation were presented in Table 7 and Table 8. *First*, Experience and skills in scientific research were the most important factor that directly and positively affected Research Motivation and Findings. This finding is consistent with previous studies such as, [20], [21], [22], [23], [24], which found that Experience and skills in scientific research had the most influence on the motivation and ability to carry out scientific research of lecturers. It cannot be denied that KNKN is the most important factor that determines the scientific activity capacity of lecturers of the University, because, if the lecturers are capable of independent scientific research, they will be self-conscious to take initiative in exploring and discovering new theoretical and practical knowledge. Only when obtaining sufficient capacity, experience, and skills in scientific research, can lecturers find their passion in this activity and be willing to devote their time and energy. However, these factors are not obtained naturally; instead, each person is required to experience the process of self-study, self-training, and self-improvement of their ability to write, observe, judge, analyse, assess, and handle a problem. In summary, if a lecturer obtains good professional knowledge in the field of research but lacks research experience and skills, the motivation and achievements of scientific research will be limited. This shows that it is very necessary to focus on developing scientific research skills for lecturers in order to improve their scientific research capacity.

As a result, universities have to provide regular and continuous training for the teaching staff and issue and implement certain policies to train and develop a team of lecturers with scientific research skills.

Second, Research motivation had a direct and positive impact on the Research findings, which was consistent with such previous studies as, [20], [21], [25], [26], [27], [28], [29], [30]. When lecturers are motivated to do research, they will, in essence, overcome all challenges to complete their tasks because they have a high determination to realize their own research goals and fulfill their commitments to the university. Many lecturers are passionate about scientific research, they put all of their enthusiasm, time, effort, and even finance to make contributions to their research in order to satisfy their curiosity and inquiry, [30]. Therefore, lecturers with Research Motivation, especially strong internal motivation, will be more determined in achieving research goals, which leads to high research productivity.

This shows that universities need to place more focus on training and improving the lecturers' work motivation, sense of responsibility and dedication, and professional attitudes.

Third, the analysis results show that the direct relation between Research Collaboration and Research Findings has no statistical

significance. This finding contradicted the research findings of [26], [27]. On the other hand, it was consistent with the findings of [29], in which research collaboration was proved to fail to contribute to predicting the total number of scientific research works of lecturers, especially international articles. The reason for this is that for scientific research work to be published in international journals, the research collaboration is not sufficient; instead, it requires regular investment in research activities from lecturers. Therefore, it is not surprising that the research findings reject the hypothesis that Research Collaboration has a direct positive influence on Research Findings. However, Research Collaboration has a direct positive influence on Research Motivation and from which it also indirectly affects the Research Findings of lecturers. According to [20], a research environment with collaboration is extremely important and has a profound influence on the motivation for scientific research. Especially for young lecturers lacking scientific research experience, the collaboration and support from their colleagues and experienced lecturers will motivate them to be more confident in carrying out scientific research.

As a result, universities have to proactively widen their connections with top experts and scientists, develop cooperative projects for lecturers to join, experience and acquire scientific research skills and widen and transfer their knowledge.

*Fourth***,** Attitude - Awareness has no direct influence but indirectly affects Research Findings through a positive relationship with Research Motivation. The research findings also showed that the influence level of Attitude - Awareness on the lecturer's scientific research activities is insignificant. This finding is also similar to the research of [20], [27], [28], which figured out that the lecturers' scientific research activities are regulated by regulations of the Ministry of Education and Training and VNU's science and technology development policy, thus, most of the lecturers have a good awareness of the importance of scientific research activities. Therefore, this factor is less volatile over time and cannot be influenced by factors related to the lecturers themselves, thereby becoming a factor that does not have a strong influence on the motivation or findings of the scientific research of lecturers.

Generally, universities need to improve the lecturers' awareness, dedication, and professional scientific attitudes, and use these as criteria for employing, promoting, or paying the teaching staff.

Fifth, similar to Attitude-Awareness, Procedures - Funding has no direct impact but indirectly affects the Research Findings through a positive relationship with Research Motivation. The detailed analysis displayed that the assessment of lecturers for the research funding provided by the university and related payment procedures is mostly average. However, Procedures-Funding has no large influence on the Research Motivation and Research Findings of VNU lecturers. While some other studies show that the research funding factor has a strong correlation with the motivation, satisfaction, and scientific research productivity of lecturers, [15], [25]. The fact from qualitative research findings shows that many lecturers have little interest or almost no dependence on funding from VNU, they can mobilise funding from enterprises or finance their family and themselves to serve their scientific research activities.

Sixth, there has had no evidence that Mechanisms and policies supporting scientific research and Professional documents, Facilities, and equipment for scientific research have a positive impact on the lecturers' scientific research. This shows that the scientific research activities of VNU lecturers are not affected by Mechanisms and Policies supporting scientific research and Professional documents, Facilities, and equipment for scientific research. This finding contradicts many domestic and foreign studies believing that these two factors are positively correlated with the lecturers' scientific research activities, [20], [22], [25]. Detailed analysis showed that the majority of lecturers were satisfied with the University's current Mechanism and policies supporting scientific research; Professional documents, Facilities, and equipment for scientific research also satisfy the demands of lecturers relatively well. Specifically, VNU currently creates favourable conditions and offers policies and regimes to encourage officials and lecturers to engage in scientific research, and reward collectives and individuals with achievements in scientific research. The university has also made efforts to mobilise resources from the State budget, from localities and other units and entities along with VNU's budget for the science and technology activities of lecturers.

In short, universities need to issue proper policies to attract resources and used them effectively for the lecturers' scientific research activities.

Table 7. Results of determining significance level and direct impact of factors

Hypotheses	Relations among variables	Impact factor		Level of significance (P – Values)		Results
H1a	TTKP -> KQNC	0.021		0.811		Rejected
H1b	TTKP -> DCNC	0.217		0.001		**Accepted**
H2a	CCCS -> KQNC	-0.059		0.468		Rejected
H2b	CCCS -> DCNC	0.053		0.350		Rejected
H3a	CSVC -> KQNC	-0.067		0.412		Rejected
H3b	CSVC -> DCNC	-0.088		0.145		Rejected
H4a	HTNC -> KQNC	0.044		0.605		Rejected
H4b	HTNC -> DCNC	0.358		0.000		**Accepted**
H5a	TDNT -> KQNC	-0.047		0.566		Rejected
H5b	TDNT -> DCNC	0.327		0.000		**Accepted**
H6a	KNKN -> KQNC	0.281		0.000		**Accepted**
H6b	KNKN -> DCNC	0.161		0.016		**Accepted**
H7	DCNC -> KQNC	0.223		0.010		**Accepted**

Table 8. Results of determining the significance level and indirect impact of factors

Hypotheses	Relations among variables	Impact factor		Level of significance (P – Values)		Results
H8	TTKP -> DCNC -> KQNC	0.048		0.028		**Accepted**
H9	CCCS -> DCNC -> KQNC	0.012		0.449		Rejected
H10	CSVC -> DCNC -> KQNC	-0.020		0.196		Rejected
H11	HTNC -> DCNC -> KQNC	0.080		0.035		**Accepted**
H12	TDNT -> DCNC -> KQNC	0.073		0.018		**Accepted**
H13	KNKN -> DCNC -> KQNC	0.036		0.104		Rejected

5 Conclusion

This research was conducted to assess the factors affecting the scientific research activities of lecturers currently working at VNU in the context of university autonomy. At the same time, the research also shows the degree of influence of each factor on the scientific research findings of lecturers.

The research has comprehensively assessed the direct and indirect impacts of the factors in the research model on scientific research activities. Based on the research findings, the scientific research activities of VNU lecturers are affected by five factors, of which two factors have a direct influence in the same direction, including: (1) Experience and skills in scientific research, (2) Scientific research motivation and three factors that indirectly affect in the same direction, including, (3) Procedures and funding for conducting scientific researches, (4) Research collaboration, (5) Attitude, awareness for the importance of scientific research. According to the normalisation factor (Beta), the degree of

impact of the above factors on the lecturers' scientific research productivity gradually decreases as follows: Experience and skills in scientific research (ß = 0.281) > Scientific research motivation (ß = 0.223) > Research collaboration (ß = 0.080) > Attitude, awareness for the importance of scientific research (ß = 0.073) > Procedures and funding for conducting scientific researches (ß = 0.048). The remaining two factors according to the initially recommended model are Mechanisms and policies supporting scientific research and Professional documents, Facilities-equipment for scientific research does not influence the scientific research activities of VNU lecturers.

This research finding can be a reference for VNU's Leaders in coming up with breakthrough solutions to attract and promote scientific research activities in the context of university autonomy; S&T development policies must be suitable with the current university autonomy context in order to further improve the efficiency of scientific research activities of lecturers, contributing to improving the training quality and brand reputation of VNU. This research can be referred to by other universities so that they can make proper policies within the current context of university autonomy implementation to improve the effectiveness and quality of scientific research. Additionally, the findings in this research are valuable references for agencies in charge of planning macro policies and higher education management. Last but not least, university students, post-graduate students, and master students can refer to this research for their scientific research purposes.

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