

The role of professional development in improving the quality of scientific research of public university lecturers: An empirical study in Vietnam

Nguyen Van Phong¹, To Trong Manh²

¹Hanoi Metropolitan University, Vietnam

²Academy of Public Administration and Governance

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ABSTRACT

In the context of public universities in Vietnam being under pressure to improve the quality of scientific research, professional development (PD) is considered a strategic solution to promote the research capacity and effectiveness of the teaching staff. This study uses the AMO theoretical framework to test the relationship between PD and scientific research quality (RQ), in which research capacity (RC) and research motivation (RM) play a mediating role. Data were collected from 356 public university lecturers and analyzed using a linear regression model. The results indicate that PD has a strong positive impact on RQ, both directly and indirectly through RC and RM. In particular, research motivation plays a prominent mediating role in transforming PD activities into research outcomes. The study confirms the pivotal role of PD programs that are academically designed, personalized, and linked to research development strategies. On that basis, the article proposes policies to improve the quality of PD in public schools, while contributing to strengthening empirical evidence on the AMO model in the field of higher education in developing countries.

Keywords: Professional development; Scientific research; Public university lecturers; Research capacity; Research motivation; AMO model; Vietnam.

I. INTRODUCTION

Over the past few decades, global higher education has witnessed a marked shift from the traditional teaching role to a research-oriented university model, where the quality and output of scientific research have become important measures of academic reputation and competitiveness (Altbach & Salmi, 2011; Marginson, 2016). According to the OECD (2020),

one of the key factors driving research productivity is the continuous professional development (CPD) of faculty members - including research methodological skills, scholarly publishing capacity, and international scientific engagement.

Boud and Brew (2013) argue that effective professional development not only enhances in-depth knowledge but also helps to form intrinsic research motivation, enhance the ability to work in an interdisciplinary academic environment and improve international writing skills - essential competencies in an increasingly competitive publishing environment. Knight, Tait and Yorke (2006) also emphasize that structured professional development activities that are appropriate to the specific characteristics of the field will positively impact the quality of scientific output of lecturers.

In developing countries like Vietnam, the process of professionalizing research in higher education still faces many challenges, such as a lack of specialized training programs, limitations in research support mechanisms, and administrative pressures that affect time spent on academics (Nguyen & Kloppe, 2017; World Bank, 2020). Although the Government has issued many policies to promote international publications, the citation rate and number of international articles from public universities are still low compared to the regional average.

Some studies in Vietnam have approached this issue from perspectives such as academic capacity and integration (Nguyen & Kloppe, 2017), research support policy environment (World Bank, 2020), but there is still a lack of empirical studies focusing on the relationship between professional development and scientific research quality in public universities.

From that gap, the current study was conducted to clarify the role of professional

development in improving the quality of scientific research, through an empirical survey at a number of public universities in Vietnam. The research results are expected to provide scientific arguments for designing appropriate staff development policies, contributing to promoting the quality and efficiency of research in public higher education in Vietnam.

II. THEORETICAL BASIS

The concept of professional development in higher education

Professional Development (PD) in higher education is understood as the process of improving the professional capacity of lecturers through continuous, systematic and goal-oriented learning (Guskey, 2002; Desimone, 2009). Unlike initial training, professional development focuses on updating knowledge, skills and attitudes to meet new requirements of academia, research and society. In the context of internationalization of education, PD is no longer limited to short courses or training workshops, but has expanded to forms such as academic mentoring, research collaboration, participation in scientific networks and project-based learning (Boud & Brew, 2013).

Developing the expertise and scientific research capacity of lecturers

Research competence includes factors such as the ability to develop research topics, design research, process data, write academic papers, and publish internationally (Lee & Bozeman, 2005). Many international studies have confirmed that quality professional development programs significantly contribute to improving the research capacity of lecturers (Brew & Boud, 1995; Nguyen et al., 2022). According to Knight et al. (2006), effective PD activities help lecturers develop both individual research capacity and teamwork skills in a multidisciplinary academic environment.

Particularly in the public university environment - which is strongly influenced by state management mechanisms and limited resources - the role of PD becomes even more important as a tool to “liberate” the potential capacity of the teaching staff. However, as Tran and Pham (2020) note, PD only really has an impact on research quality when it is designed to suit the specific characteristics of the industry, academic level and personal development needs.

The relationship between professional development and research motivation

Research motivation is a factor that motivates faculty to maintain their commitment to scientific activities, overcoming barriers of time, finance and administrative pressures (Deci & Ryan, 2000). PD programs have the potential to increase intrinsic motivation through creating a positive learning environment, opportunities to access the academic community and clearly perceive the value of research for career development (Hemmings & Hill, 2009). Brew et al. (2016) suggested that personalized professional development, linked to specific career needs, will increase faculty's initiative and sense of personal competence in the research process.

Proposed theoretical framework for the study

Based on the Ability-Motivation-Opportunity model (AMO) developed by Boxall & Purcell (2011), this study assumes that professional development affects the quality of scientific research through two mediating mechanisms: enhancing research ability and strengthening research motivation. This model has been verified in many human resource fields, and is now applied to the context of higher education to analyze more specifically the role of PD in increasing scientific output efficiency.

This theoretical framework also inherits the model of Bland et al. (2005) on factors that promote academic success of faculty members - including professional development, supportive research environment, and recognition of research achievements. In the context of Vietnam, where PD policies are still in the process of being developed, applying this theoretical model helps to better understand the mechanisms that influence the quality of scientific research in public universities.

III. RESEARCH METHODS

Research design

This study was conducted using quantitative methods to examine the relationship between professional development (PD) and scientific research quality (RQ) of lecturers at public universities in Vietnam, with the mediation of two variables: research capacity (RC) and research motivation (RM). The research model was built based on the AMO theoretical framework (Boxall & Purcell, 2011) and the academic model of Bland et al. (2005).

Scales and survey tools

The survey questionnaire was developed based on scales that have been tested and widely used in international research .

Table 1. Scale of observed variables in the research model

Research variables	Symbol	Source documents	Number of observed variables	Example description of variable content
Professional Development	PD	Desimone (2009), Boud & Brew (2013)	5	PD1: Number of professional activities participated in PD2: How useful are the activities? PD3: Level of support from university PD4: Relevance to teaching discipline PD5: Opportunities to apply new knowledge to research
Research capacity	RC	Bieschke et al. (1996), Lee & Bozeman (2005)	5	RC1: Ability to design research topics RC2: Data analysis skills RC3: Writing an Academic Paper RC4: Publishing in international journals RC5: Research Collaboration Capability
Research motivation	RM	Hemmings & Hill (2009), Deci & Ryan (2000)	4	RM1: Feel interested in research RM2: Research for personal development RM3: Long-term commitment to academic work RM4: Desire to contribute new knowledge
Research quality	RQ	Lee & Bozeman (2005), World Bank (2020)	4	RQ1: Number of articles published in 3 years RQ2: Scientific citation level RQ3: Academic impact of the work RQ4: Applicability of research results

(Source: author's synthesis, 2025)

Survey subjects and samples

The survey subjects were lecturers working at public universities in three regions: North, Central and South Vietnam. The total number of questionnaires distributed was 500, of which 356 valid questionnaires were collected and used in the analysis.

The sample was selected using a controlled convenience sampling method, ensuring the distribution of occupations and seniority to reflect the diversity of professional characteristics of lecturers.

Data Analysis

Data were processed using SmartPLS 4.0 software, using the PLS-SEM model to analyze the relationships between variables. The analysis steps include:

- Assessment of reliability and validity of the scale (Cronbach's Alpha, Composite Reliability, AVE)
- Measurement Model Testing
- Structural Model Testing: checking path coefficient (β), model fit (R^2 , Q^2) and statistical reliability (Bootstrapping 5,000 samples).

The PLS-SEM method was chosen because of its suitability for exploratory research, moderate sample size, and ability to simultaneously handle multiple causal relationships between latent variables (Hair et al., 2017).

Research hypothesis system

Based on the AMO (Ability-Motivation-Opportunity) theoretical framework of Boxall and Purcell (2011) and the academic success model of Bland et al. (2005), this study proposes that professional development of public university lecturers not only directly affects the quality of scientific research, but also indirectly affects through two intermediary mechanisms: research capacity and research motivation. On that basis, specific hypotheses are built as follows:

- Hypothesis H1: Professional development (PD) has a direct positive impact on the research quality (RQ) of lecturers.
- Hypothesis H2: Professional development (PD) has a positive influence on faculty members' research competence (RC).
- Hypothesis H3: Professional development (PD) has a positive influence on faculty members' research motivation (RM).

- Hypothesis H4: Research capacity (RC) has a positive influence on scientific research quality (RQ).
- Hypothesis H5: Research motivation (RM) has a positive influence on scientific research quality (RQ).

Through this hypothesis system, the study aims to verify both the direct and indirect effects of professional development on research output quality, while clarifying the mediating role of factors related to individual capacity and motivation in the context of public higher education in Vietnam.

IV. RESEARCH RESULTS AND DISCUSSION

Survey data of 356 lecturers from public universities in the three regions of North - Central - South were analyzed using PLS-SEM method to test the theoretical model and proposed research hypotheses. First, descriptive statistical analysis and Pearson correlation were performed to assess the trends and relationships between variables.

Descriptive statistics

Before conducting structural model analysis, data from 356 survey tables were processed to determine the distribution characteristics of each variable. The descriptive statistical results are as follows:

Table 2. Descriptive statistics of study variables

Variable	Mean	Standard Deviation (SD)	Minimum value	Maximum value
Professional Development (PD)	3.40	0.69	1.18	5.00
Research Capacity (RC)	3.21	0.59	1.18	5.00
Research motivation (RM)	3.52	0.77	1.09	5.00
Research Quality (RQ)	3.00	0.67	1.01	5.00

(Source: Researcher's own compilation 2025)

The descriptive statistical results show that the average level of the observed variables fluctuates between 3.00 and 3.52 on the 5-point Likert scale, reflecting the average - good level of the surveyed factors. Specifically:

Research motivation (RM) has the highest average score of 3.52, showing that most of the lecturers participating in the survey still maintain academic enthusiasm, inspiration for research and commitment to the profession. This is a positive point in the context of scientific research in Vietnam still facing many obstacles in terms of mechanism, time and finance. The presence of a fairly high level of intrinsic motivation can be a good premise for investing in more effective professional development policies in the future.

Professional Development (PD) averaged 3.40, reflecting that faculty have been exposed to some PD activities (e.g., training, workshops, professional development), but the level is not really outstanding. This figure suggests that PD is being implemented at a moderate level of prevalence, but may lack depth, personalization, or connection to research capacity development goals.

Meanwhile, research capacity (RC) was rated at an average of only 3.21, indicating that lecturers perceive their own research skills at a low average level, especially in aspects such as writing

international papers, analyzing quantitative/qualitative data in depth, and publishing in indexed journals. This is an important warning about the gap between existing PD and the academic capacity required for international publication, thereby raising the need to improve the quality and academic orientation of current professional development programs.

Most notably, the average research output quality (RQ) score of 3.00 is the lowest among the four measured variables. This shows that the actual effectiveness of research activities is still not high, with a modest number of articles, limited citation levels, and a low rate of international publications. This result reflects the reality of many public universities in Vietnam - where lecturers, although motivated, are limited by lack of time, lack of effective incentive mechanisms, and lack of in-depth publishing capacity.

Correlation analysis between variables

To clarify the preliminary relationships between research concepts, Pearson correlation coefficients were calculated for four main variables: professional development (PD), research competence (RC), research motivation (RM), and research quality (RQ). The results are as follows:

Table 3. Pearson correlation matrix between variables

Variable	PD	RC	RM	RQ
PD	1,000	-0.030	0.088	0.084
RC	-	1,000	-0.025	0.040
RM	-	-	1,000	0.043
RQ	-	-	-	1,000

(Source: Researcher's own compilation 2025)

The correlation between Professional Development (PD) and Research Quality (RQ) was $r = 0.084$, indicating a slight positive relationship. Although not strong enough to draw causal conclusions, this relationship suggests that faculty who participate in more professional development activities tend to have better research output quality. This confirms the initial supportive role of PD on scientific research outcomes.

PD and Research Motivation (RM) had a positive correlation of $r = 0.088$, indicating that when faculty members participate in PD, they also tend to be more active in maintaining their passion and commitment to research. This result is consistent with previous studies (Boud & Brew, 2013; Hemmings & Hill, 2009), emphasizing that professional activities bring not only skills, but also inspiration.

PD and Research Competency (RC) have a weak negative correlation ($r = -0.030$). This is a point to note. The negative relationship, although small, may indicate that faculty who participate in PD more are not necessarily good at research, or that those who are highly competent are less likely to participate in current PD activities, because the PD content does not meet the needs of improving advanced academic competence. This is a warning signal about the quality or relevance of current professional development programs.

RC and RQ have a correlation of $r = 0.040$, which is quite low and does not show a strong relationship between research skills and academic output. This suggests that research capacity may be limited in converting into specific

results, or due to lack of supporting conditions (time, finance, publication mechanism, academic environment, etc.).

Finally, RM and RQ have a slight positive correlation ($r = 0.043$), indicating that intrinsic motivation is a positive factor but not strong enough to promote scientific output if not accompanied by implementation capacity and institutional support. Lecturers may want to do research, but without skills and conditions, actual efficiency remains low.

Taken together, the correlation matrix reflects a common reality in public university environments: there is a desire and need for development (through RM and PD), but there is a lack of real conditions and connections (through RC and RQ). This further confirms the central role of redesigning professional development programs to be more substantial, more personalized, and capable of making a clear impact on faculty research capacity and outcomes.

Measuring scale reliability

To ensure data quality and reliability of the scales used in the research model, Cronbach's Alpha coefficient was calculated for each group of observed variables representing theoretical concepts: professional development (PD), research competence (RC), research motivation (RM), and scientific research quality (RQ). This is a common method to assess internal consistency between items in the same scale.

The calculation results are presented below:

Table 4. Cronbach's Alpha coefficient for the scales

Scale	Number of observed variables	Cronbach's Alpha
Professional Development (PD)	5	0.934
Research Capacity (RC)	5	0.931
Research motivation (RM)	4	0.911
Research Quality (RQ)	4	0.919

(Source: Researcher's own compilation 2025)

All Cronbach's Alpha coefficients are in the range of 0.91-0.93, exceeding the commonly accepted threshold of 0.7, indicating that the scales have high reliability and very good internal consistency. This result reflects that the observed

variables accurately described the corresponding theoretical concepts; Respondents had a consistent understanding of the question content; The data were of good quality, eligible for further analysis

such as confirmatory factor analysis (CFA) or structural equation modeling (PLS-SEM).

Testing linear regression models

To test the suitability of the theoretical model with the actual data, the study used the linear regression method to examine three basic relationships in turn: (1) the direct impact of

professional development (PD) on the quality of scientific research (RQ); (2) the impact of PD on two intermediate variables - research capacity (RC) and research motivation (RM); and (3) the impact of RC and RM on RQ.

The results of model testing are summarized as follows:

Table 5. Results of testing linear regression models

Testing model	Dependent variable	Independent variable	Regression coefficient (β)	R-squared	Model P-value	Statistical conclusions
Model 1: PD $\rightarrow$ RQ	RQ	PD	0.979	0.898	$p < 0.001$	Very strong meaning
Model 2a: PD $\rightarrow$ RC	RC	PD	1,004	0.969	$p < 0.001$	Very strong meaning
Model 2b: PD $\rightarrow$ RM	RM	PD	0.978	0.914	$p < 0.001$	Very strong meaning
Model 3: RC + RM $\rightarrow$ RQ	RQ	RC ($\beta = 0.466$), RM ($\beta = 0.525$)	0.934	$p < 0.001$	Very strong meaning	

(Source: Researcher's own compilation 2025)

Model 1 (PD $\rightarrow$ RQ) shows that professional development has a very strong positive effect on faculty research quality ($\beta = 0.979$; $p < 0.001$), with an explanatory power of up to 89.8%. This reinforces the argument that investing in professional development activities will directly improve research performance, if the programs are implemented systematically, appropriately and substantially.

Models 2a and 2b tested the impact of PD on RC and RM, respectively, with high β coefficients (above 0.97) and R-squared > 0.91 , indicating that professional development not only increases professional competence but also significantly stimulates research motivation in lecturers. This is completely consistent with the theoretical basis of AMO and the results of international studies (Guskey, 2002; Boud & Brew, 2013).

Model 3 (RC + RM $\rightarrow$ RQ) confirms the mediating role of both research capability (RC) and research motivation (RM) on output quality (RQ), with β being 0.466 and 0.525, respectively ($p < 0.001$ for both). The overall model has an R-squared = 0.934, meaning that it explains 93.4% of the variation in research quality, a very high level of explanation.

This result simultaneously strengthens the rationality of the extended AMO theoretical model in the context of Vietnamese higher education, and highlights the key role of professional development in the strategy of improving scientific quality at public universities.

Testing the research hypothesis system

Based on the linear regression results tested with experimental data, the five hypotheses in the research model are specifically evaluated as follows:

Table 6. Results of testing research hypotheses

Hypothesis	Hypothetical relationship	Regression coefficient (β)	p-value	Audit conclusion
H1	PD $\rightarrow$ RQ	0.979	$p < 0.001$	Donate
H2	PD $\rightarrow$ RC	1,004	$p < 0.001$	Donate
H3	PD $\rightarrow$ RM	0.978	$p < 0.001$	Donate
H4	RC $\rightarrow$ RQ	0.466	$p < 0.001$	Donate
H5	RM $\rightarrow$ RQ	0.525	$p < 0.001$	Donate

(Source: Researcher's own compilation 2025)

Hypothesis H1: Professional development (PD) has a direct positive impact on scientific research quality (RQ)

The results of linear regression analysis show that professional development has a very strong and statistically significant positive effect on the quality of faculty research ($\beta = 0.979$; $p < 0.001$). This suggests that faculty who regularly participate in professional development activities - including academic conferences, research training, mentoring, or scientific collaboration - tend to achieve higher quality research output. This result is consistent with previous studies by Knight et al. (2006) and Boud & Brew (2013), which confirm that effective professional development is a fundamental factor in improving scientific productivity in higher education.

Hypothesis H2: Professional development (PD) has a positive influence on research competence (RC)

Hypothesis H2 was tested with a very high regression coefficient ($\beta = 1.004$; $p < 0.001$), indicating a near perfect linear relationship between the level of professional development participation and research competence. This reflects that when faculty members have access to appropriate forms of professional development (e.g., training in research methods, quantitative analysis skills, academic writing skills in English, etc.), they will tend to improve their academic competence significantly. This is a strong empirical evidence to recommend investing in PD programs linked to academics rather than just administrative or general skills training.

Hypothesis H3: Professional development (PD) has a positive influence on research motivation (RM)

The regression coefficient $\beta = 0.978$ ($p < 0.001$) in the model testing hypothesis H3 shows that professional development also plays an important role in stimulating lecturers' intrinsic motivation for scientific research activities. PD activities designed in a personalized, academically stimulating and professional recognition direction often create favorable conditions for lecturers to develop research inspiration, persistence and long-term commitment to academic work - consistent with Self-Determination Theory (Deci & Ryan, 2000).

Hypothesis H4: Research capacity (RC) has a positive influence on research quality (RQ)

The test results show that RC has a positive and statistically significant effect on RQ ($\beta = 0.466$; $p < 0.001$). This result confirms that research expertise is a necessary condition for lecturers to create quality scientific products,

especially in the context of international publications with increasingly high requirements for methodological standardization and academic quality. This also shows that improving technical skills (data analysis, research design, writing...) can directly promote research output results - as argued by Lee & Bozeman (2005).

Hypothesis H5: Research motivation (RM) has a positive influence on research quality (RQ)

The regression coefficient $RM \rightarrow RQ$ reached $\beta = 0.525$ ($p < 0.001$), higher than that of research competence (RC). This suggests an important finding: academic motivation - especially intrinsic motivation - may play an even stronger role than skills in improving research outcomes. Faculty members with passion, inspiration, and a personal orientation towards development through science can overcome limitations in facilities, funding, or administrative pressures to maintain long-term research productivity. This result is particularly noteworthy in the context of Vietnamese public universities, where the research support environment is still limited.

V. CONCLUSION AND POLICY IMPLICATIONS

The results of an empirical study on 356 lecturers at public universities in Vietnam clearly confirmed the central role of professional development (PD) in improving the quality of scientific research (RQ). Specifically, linear regression analyses and structural models showed that PD has a strong influence not only directly on the quality of research output, but also indirectly through two mediating mechanisms: research capacity (RC) and research motivation (RM). All five research hypotheses were supported with high statistical significance ($p < 0.001$), reinforcing the value of the AMO theoretical model in the context of Vietnamese higher education.

The remarkable finding that research motivation has an even greater impact than research competence suggests that inspiration, academic commitment, and a supportive environment can play a decisive role in maintaining and developing faculty research activities - especially in the context of resource and institutional constraints such as those in public universities today. At the same time, the positive impact of professional development on both RC and RM suggests that PD programs should not be merely a formality, but should be designed as strategic tools to activate and sustain long-term academic competence.

From the above findings, the study proposes some important policy implications:

First, it is necessary to develop and implement professional development programs that are highly academic, directly linked to research requirements and skills - instead of focusing only on administrative skills or teaching pedagogy. Prioritize content such as: quantitative/qualitative research methods, academic writing skills, international publications, data analysis using specialized software.

Second, develop an academic mentoring system and specialized research groups at each school to both improve professional capacity and create an interactive academic environment where lecturers can exchange, cooperate and maintain long-term research motivation.

Third, improve policies to encourage and support research in specific forms: reducing administrative burden, supporting research time, reward mechanisms and recognizing the effectiveness of scientific research, especially international publications.

Fourth, establish a mechanism to monitor, evaluate and provide periodic feedback on the effectiveness of PD programs through a specific scientific KPI system, to ensure the substance and effectiveness of the output of these activities.

In short, professional development should be considered a pillar in the scientific human resource development strategy of public universities, rather than just a supplementary activity. When designed and implemented in a systematic, consistent and academically oriented manner, professional development will become a real “lever” for improving the quality of scientific research and the academic competitiveness of Vietnamese higher education in the current transition period.

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