

Factors Affecting The Development Of Professional Skills For In Physical Education Students: A Case Study At Thai Nguyen University Of Education

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Abstract

Professional skills are understood as the ability of a person to perform a professional job effectively in an appropriate time, with certain conditions, based on the harmonious integration of knowledge, skills, and attitudes.

The study was conducted to evaluate the factors affecting the development of professional skills for physical education students at Thai Nguyen University of Education (TNUE) with 7 influencing factors proposed by the authors. The results of the survey analysis of groups of subjects including employers, students, alumni, lecturers and managers showed that: The three factors with the greatest impact on the development of professional skills for students include the capacity of lecturers (influence coefficient is 0.255), student capacity (influence coefficient is 0.216) and attitudes and perceptions of students (influence coefficient is 0.204).

Keywords: development; professional skills; students; physical education; influencing factors

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I. Introduction

Professional skills are the ability to perform a professional job effectively in a timely manner, with certain conditions, based on the harmonious integration of knowledge, skills, and attitudes.

Physical education teacher training requires professional skills in the field of physical education and sports, as well as pedagogical skills in accordance with current regulations and social needs.

Established on August 5, 1995, the Faculty of Physical Education and Sports of Thai Nguyen University of Education aims to train and develop teachers and managers in the field of physical education and school sports with good political and moral qualities; a solid foundation in knowledge, expertise, and skills; the ability to self-study, research, create, and solve the requirements of educational theory and practice; adaptability to lifelong learning; and foreign language and computer skills to meet the requirements of work and international integration.

However, Thai Nguyen University of Education's current activities to develop professional skills for physical education students have not produced high results. Many students after graduation find it difficult to find a job related to their major, or are still confused when they have to take on positions that they were not prepared for.

A study is needed to assess the factors that affect the development of professional skills for physical education students at Thai Nguyen University of Education so that the school can make improvements in training to improve the quality of student output.

II. Methodology

Research design

The study used a descriptive survey design. Descriptive surveys provide data in the form of variables of interest and collect factual information about the factors that affect the development of professional skills for students. A questionnaire survey was created to investigate the factors that affect the development of professional skills for students majoring in Physical Education at Thai Nguyen University of Education.

Based on previous studies by Luu Chi Danh et al. (2021) and Duong Thong Nhat et al. (2021), the research team constructed the following research model:

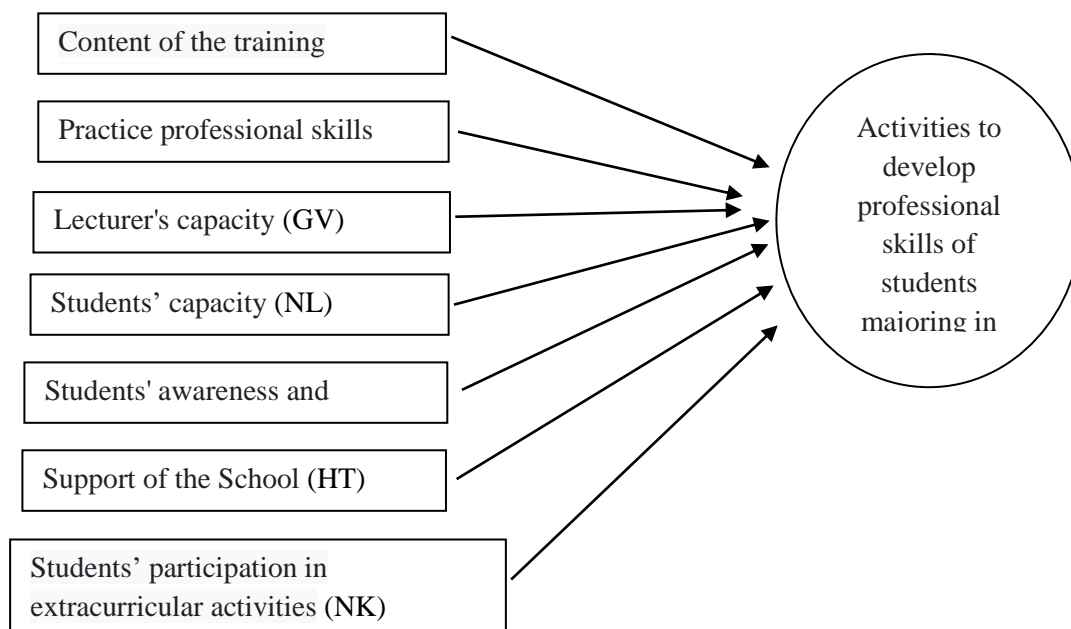


Figure 1: Research model

The number of observed variables in each factor affecting the development of professional skills for students of the Physical Education major at Thai Nguyen University of Education was proposed by the research team as follows:

Table 1: Number of observations for each proposed influencing factor

No.	Variables	Number of observed variables
1	Content of the training program	6
2	Practice professional skills	3
3	Lecturer's capacity	8
4	Students' capacity	8
5	Students' awareness and attitudes	6
6	Support of the School	6
7	Students' participation in extracurricular activities	3

Source of Data

Data collection is essential for obtaining high-quality information and drawing insightful conclusions. It allows researchers to fill in the gaps in their knowledge and answer their research questions. To ensure the quality of the data, it is important to use multiple sources and evaluate the credibility of the sources. The research team used a variety of data search support tools over the internet, such as Google, Wikipedia, and Google Scholar.

Sampling

Sampling is a research technique involving taking a small sample from a big population and analyzing it to determine its characteristics. To infer population characteristics, the characteristics of the sample gathered are employed.

Sample size

Based on the study of Hair, Anderson, Tatham and Black (1998) for reference on expected sample size. Accordingly, the minimum sample size is 5 times the total number of observed variables. That means $n=5*m$, in which:

n: Minimum number of samples

m: number of observations

Based on the 7 factors with 40 observations proposed by the authors, the minimum number of samples that need to be investigated is: $n = 5 * 40 = 200$ samples

So to ensure the minimum number of samples and fully survey the subjects, the research team conducted a survey on the number and subjects of the survey as follows:

+ Subjects are students studying Physical Education at TNUE. Number of survey samples: 81 (survey of all students)

+ Subjects are former students majoring in physical education at the TNUE. Number of survey samples: 80

+ Subjects are lecturers who are teaching Physical Education and managers at TNUE. Number: 30 including all lecturers of the Department of Physical Education (25 people) and 5 management staff at the TNUE.

- The survey subjects are employers. Number of survey samples: 120 surveys

Thus, the total number of questionnaires and surveys used for analysis is 311.

Data Analysis Techniques

Data analysis is the process of classifying data into categories based on their common characteristics (Orodho, 2009). In this study, all data were first coded by source. Based on the research questions, qualitative data were classified into themes. Descriptive statistics such as means, frequencies, and percentages were used to summarize quantitative data. Qualitative data analysis involves analyzing the themes that emerge from observations as well as field documents. In addition, quantitative data were also collected and presented in tabular form to explain and answer the research questions using frequencies and percentages. The relationship between independent variables and dependent variables was investigated using inferential statistics.

Quantitative research was conducted using a survey questionnaire sent via email. The scale used was a 5-point Likert scale, ranging from (1): "strongly disagree" to (5): "strongly agree." The "perceived risk" factor was measured using the scale of Forsythe et al. (2006), Garbarino and Strahilevitz (2004), which will perform both path and virtual orientation. The electronic questionnaire was conducted using custom software based on Google Drive and the respondent's answers were saved in a database, imported into Excel and SPSS. Finally, regression analysis was used on the data to test the research hypotheses. Inferential statistics were used to test the relationship between independent and dependent variables. The Social Science Statistical Package (SPSS) software version 26 was used in data analysis.

Data Processing and Analysis

The statistical methods used in this study to evaluate the data collected are reliability analysis and descriptive statistics. Reliability testing shows the overall consistency of a measure. When a measure produces comparable findings in a consistent context, it is said to have high reliability.

Descriptive analysis considers the mean, frequency, maximum, minimum, and range (maximum-minimum) of the variables. The ANOVA test (analysis of variance) is a tool to determine whether the results of a survey or experiment are significant or not. In other words, this test determines whether the null hypothesis is not rejected or the alternative hypothesis is accepted. The ANOVA test compares two groups to see if there is a difference between them. If the p-value of a variable is greater than 0.05, there is no difference between the variables and vice versa. The data was also analyzed using Cronbach's Alpha and factor analysis.

❖ Reliability

Reliability is the extent to which results are consistent over time and accurately represent the population being studied (Healy & Perry, 2000). Cronbach's Alpha will be used to measure reliability and internal consistency, which shows how well the items in a set correlate with each other. It also assesses the correlation between test items, with a score of 1 being higher for consistency and internal reliability and 0.7 to 0.9 being acceptable.

Table 2: Values of Cronbach's Alpha

Cronbach's alpha	Internal consistency
$a > 0.9$	Excellent
$0.8 < a < 0.9$	Good
$0.6 < a < 0.8$	Acceptable
$0.5 < a < 0.6$	Questionable
$a < 0.5$	Unacceptable

Cronbach's alpha is a widely used measure of internal consistency. It is a test that is used to assess the reliability of a scale. A Cronbach's alpha score that is too high (around 0.95 or higher) indicates that there is a high degree of redundancy among the items in the scale. A good Cronbach's alpha score for a factor indicates

that the observed variables are all well-correlated with each other and that the scale is a good measure of the underlying factor.

*** Multivariate regression analysis**

Regression analysis is a statistical method that studies the relationship of a variable (called the dependent variable or the explained variable) with one or more other variables (called the independent or explanatory variable). The prediction model looks like this:

$$Y = 00 + 01 * X_1 + 02 * X_2 + 03 * X_3 + \dots + \pi_i * X_i + a$$

Y: dependent variable

X_i: independent variables

00: constant

π_i: regression coefficients

a: random component or confounding factor

The dependent variable is the "decision" factor and the independent variable is the factors affecting the decision to choose.

Regression analysis is used to estimate the value of the dependent variable based on the value of the provided independent variables. Correlation analysis is due to the intensity of the association between the variables, it allows to evaluate the degree of rigor of the dependencies between the variables. Using multivariate regression method to predict the impact strength of the factors on the choice.

III. Findings and Discussion

Exploratory factor analysis (EFA)

Table 3. KMO index and Bartlett's Test
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.892
Bartlett's Test of Sphericity	Approx. Chi-Square	3641.428
	Df	345
	Sig.	.000

Putting all 40 observed variables into EFA analysis, we have the following analysis results: KMO = 0.892; sig Bartlett's Test = 0.000 < 0.05. Thus, the factors included in the analysis are appropriate

When performing Rotated Component Matrix analysis of 40 observed variables divided into 7 factors, all observed variables have Factor Loading coefficients greater than 0.5 and there are no longer bad variables. Thus, there are 40 observed variables that converge and differentiate into 7 factors.

Table 4: Test of Reliability

Variables	No. of question	Cronbach's Alpha	Internal consistency
Content of the training program	1-6	0.841	Good
Practice professional skills	7-9	0.827	Good
Lecturer's capacity	10-17	0.811	Good
Students' capacity	18-25	0.843	Good
Students' awareness and attitudes	26-31	0.848	Good
Support of the School	32-37	0.878	Good
Students' participation in extracurricular activities	38-40	0.975	Excellent

The Cronbach's Alpha coefficient of each scale is as follows: 1) Training program (CT) = 0.841; 2) Professional training (RL) = 0.827; 3) Lecturer capacity (GV) = 0.811; 4) Student capacity (NL) = 0.843; 5) Awareness and attitude of students (NT) = 0.848; 6) School support (HT) = 0.878; 7) Participation in extracurricular activities (NK) = 0.975. The reliability coefficients of the scales from 0.811 to 0.975 are relatively high. This proves that observed variables in the same factor measure the same concept.

Regression analysis and model testing

a. Describe factors affecting professional skills development activities

Factor analysis revealed that all factors influencing the development of professional skills in Physical Education students had high mean values (Table 5). While those related to student and lecturer capacity (NT, NL, GV) had the highest average scores (>3.60), the training program factor (CT) had the lowest (3.0565).

Thus, the respondents believed that student and lecturer capacity is essential for developing professional skills, while the training program has little impact because it should include more practical courses. The school's curriculum currently includes many practical courses, but these do not help students much.

Table 5. Descriptive statistics of factors
Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Content of the training program (CT)	311	1.00	5.00	3.0565	.65498
Practice professional skills (RL)	311	1.00	5.00	3.4752	.67706
Lecturer's capacity (GV)	311	1.00	5.00	3.6078	.65028
Students' capacity (NL)	311	1.00	5.00	3.7214	.57889
Students' awareness and attitudes (NT)	311	1.00	5.00	3.9905	.88596
Support of the School (HT)	311	1.00	5.00	3.4932	.80287
Students' participation in extracurricular activities (NK)	311	1.00	5.00	3.4752	.58862
Valid N (listwise)	311				

In general, the research results show that the survey subjects quite agree with the factors proposed by the research team that affect the professional skills development activities for students majoring in Physical Education at TNUE. However, to know which of the above factors has a high influence and which has a little influence, it is necessary to perform correlation and regression analysis in the next steps.

b. Pearson correlation analysis

Table 6. Correlation matrix according to Pearson coefficient
Correlations

		CT	RL	GV	NL	NT	HT	NK	Dependent variable
CT	Pearson Correlation	1	.420**	.412**	.361**	.343**	.279**	.361**	.559**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311
RL	Pearson Correlation	.421**	1	.465**	.400**	.412**	.491**	.400**	.622**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311
GV	Pearson Correlation	.417**	.465**	1	.432**	.408**	.448**	.432**	.520**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
	N	311	311	311	311	311	311	311	311
NL	Pearson Correlation	.362**	.400**	.432**	1	.311**	.362**	1	.433**
	Sig. (2-tailed)	.000	.000	.000		.000	.000		.000
	N	311	311	311	311	311	311	311	311
NT	Pearson Correlation	.343**	.412**	.407**	.311**	1	.343**	.311**	.566**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	311	311	311	311	311	311	311	311
HT	Pearson Correlation	.277**	.492**	.449**	.362**	.343**	1	.362**	.517**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000
	N	311	311	311	311	311	311	311	311
NK	Pearson Correlation	.343**	.412**	.407**	.311**	1	.343**	1	.311**
	Sig. (2-tailed)	.000	.000	.000	.000		.000		.000
	N	311	311	311	311	311	311	311	311
Dependent variable	Pearson Correlation	.558**	.620**	.521**	.434**	.567**	.518**	.449**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	311	311	311	311	311	311	311	311

** . Correlation is significant at the 0.01 level (2-tailed).

The correlation between the dependent variable (professional skills development activities for students majoring in Physical Education) and the independent variable (CT, RL, GV, NL, NT, HT, NK) has a uniform correlation coefficient. greater than 0.1, the highest is RL = 0.622 and the lowest is NK = 0.311. Thus, we can conclude that the independent variable can be included in the model to explain the dependent variable. On the other hand, besides the correlation between the independent variables and the dependent variable, there is also a correlation between the independent variables of the training service quality scale and the correlation coefficients between the variables are large. more than 0.1; The lowest correlation coefficient is 0.279 and the highest is 0.448, so all of these variables are considered independent variables in the next regression models. Because of the correlation of these variables, attention should be paid to the issue of multicollinearity in subsequent analyses.

c. Multivariate regression analysis

Through the results of the Pearson correlation analysis above, we see that all independent variables of the model are strongly correlated with the dependent variable; Therefore, all of these variables were selected to be included in the next step of analysis, which is multivariate regression analysis.

In this analysis, to evaluate the suitability of the model, the coefficient of determination R2 or adjusted R2 is used; These two values represent the suitability of the model and the value of R2 or adjusted R2 must be greater than or equal to 0.5.

On the other hand, to test the fit of the model, people use the F test; This test hypothesizes H0 = independent variables do not affect the dependent variable. If the sig value is very small, <0.05, then it is safe to reject the hypothesis H0 and this means that the multiple linear regression model is suitable for the data set.

With the Enter method (variables are entered once) the results of the multiple linear regression analysis are given below.

Table 7. Regression results using the Enter method

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.778 ^a	.614	.611	.46851

a. Predictors: (Constant), CT, RL, GV, NL, NT, HT, NK

The results show that the value R2 = 0.614 and adjusted R2 = 0.611; This proves that the model reaches an appropriate level of 1%, or in other words, 61.4% of the variation in the variable. Professional skills development activities of students majoring in Physical Education are explained by the independent variable. in the model.

Table 8. Results of ANOVA analysis of variance

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.852	7	23.309	110.821	.000 ^a
	Residual	44.599	304	.210		
	Total	118.451	311			

a. Predictors: (Constant), CT, RL, GV, NL, NT, HT, NK

b. Dependent Variable: Hoạt động phát triển kỹ năng nghề nghiệp của sinh viên ngành giáo dục thể chất

The results show that the F statistic value has the value sig. very small equal to 0.000, so the built regression model is suitable for the collected data set. Thus, the independent variables in the model all have a relationship with the dependent variable.

Table 9. Analysis table of multivariate regression coefficients

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		Sig.	Collinearity Statistics	
	B	Std. Error	Beta	t		Tolerance	VIF
(Constant)	-.671	.191		-3.124	.002		
CT	.132	.035	.134	3.650	.000	.748	1.342
RL	.159	.042	.197	2.443	.000	.526	1.900
GV	.379	.058	.255	7.086	.005	.745	1.542
NL	.189	.056	.216	3.597	.005	.482	2.075
NT	.136	.045	.204	3.045	.002	.548	1.826

HT	.165	.058	.117	2.842	.005	.553	1.809
NK	.121	.045	.162	2.071	.005	.564	1.763

a. Dependent Variable: Activities to develop professional skills for students majoring in Physical Education

Through the above results, we see that the model does not violate the multicollinearity phenomenon because the independent variables' variance inflation factor (VIF) is less than 2, so the serial correlation phenomenon (multicollinearity problem) is not necessary. must be considered.

The results also show the value sig. of the independent variables CT, RL, GV, NL, NT, HT, NK are all less than or equal to 0.05, so these independent variables all have an impact on student satisfaction with 95% confidence.

On the other hand, we see that the standardized regression coefficients (Beta) of the independent variables all have positive signs, meaning that these variables are positively related to the dependent variable_ student satisfaction. From the results in table 9, we form a multivariate regression equation with standardized Beta coefficient as follows

$$\text{Activities to develop professional skills for students majoring in Physical Education} = 0.134\text{CT} + 0.197\text{RL} + 0.255\text{GV} + 0.216\text{NL} + 0.204\text{NT} + 0.117\text{HT} + 0.162\text{NK}$$

d. Test the hypotheses of the research model

The results show that there are hypotheses that need to be tested: H1 to H7, this hypothesis provides a positive relationship between influencing factors and professional skills development activities of Physical Education students at TNUE. Through the above analysis results, based on the value sig. In multivariate regression analysis, the author found that with 95% confidence, the 7 initially proposed hypotheses H1 to H7 were all accepted.

Table 10. Summary table for testing research hypotheses

	Hypothesis	Inspection results
H1	Content of the training program affects the Activities to develop professional skills for students majoring in Physical Education at TNUE development activities of students majoring in physical education at TNUE	Accepted
H2	Practice professional skills affects the Activities to develop professional skills for students majoring in Physical Education at TNUE	Accepted
H3	Lecturer's capacity affects the Activities to develop professional skills for students majoring in Physical Education at TNUE	Accepted
H4	Students' capacity affects the Activities to develop professional skills for students majoring in Physical Education at TNUE	Accepted
H5	Students' awareness and attitudes affects the Activities to develop professional skills for students majoring in Physical Education at TNUE	Accepted
H6	Support of the School affects the Activities to develop professional skills for students majoring in Physical Education at TNUE	Accepted
H7	Students' participation in extracurricular activities affects the Activities to develop professional skills for students majoring in Physical Education at TNUE	Accepted

After regression analysis, there are 7 factors that influence the professional skills development for students majoring in Physical Education at TNUE. Based on the standardized Beta coefficient, the importance of the factors for the professional skills development for students majoring in Physical Education is determined. On the other hand, descriptive statistics also give us results about the survey

subjects' evaluation of these 7 factors.

Table 11. Standardized weights and average values of factors

Variables	Normalized weights	Mean
CT	.134	3.0565
RL	.197	3.4752
GV	.255	3.6078
NL	.216	3.7214
NT	.204	3.9905
HT	.117	3.4932
NK	.162	3.4752

The data shows that the factors of Lecturers' capacity, Students' capacity, and Students' attitudes and perceptions have the highest weights, indicating that these three factors have the greatest impact on the development of professional skills in Physical Education students. These three factors also have the highest mean values among the seven factors.

IV. Conclusion

Research results show that, after testing the research model, the scales achieved acceptable reliability and validity. The results also show that there are 7 factors affecting the professional skills development for students majoring in Physical Education at TNUE.

The three factors that have the greatest influence on the professional skills development for students majoring in Physical Education at TNUE include lecturers' capacity, students' capacity and students' attitudes and awareness.

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