International Journal of Religion
2024
Volume: 5| Number 7 | pp. 741 – 748
ISSN: 2633-352X (Print) | ISSN: 2633-3538 (Online)
ijor.co.uk
DOI: https://doi.org/10.61707/7zvcjt06

Developing a Toolkit to Measure the Impact of Programme Assessment Result on Improving the Teaching Quality

Thi Bich Ngoc Nguyen[1] and Huy Tung Le[2]

Abstract

This study aimed to develop a valid and reliable toolkit to measure the impact of external assessment results and improve teaching activities in engineering majors at Vietnamese universities. The study comprised two stages: development and testing of the questionaire. In addition to desk research, expert interviews were conducted with six education quality assurance specialists to assess the content and construct validity of a several items intended to gauge the impact of external assessment results on improving teaching activities in the questionaire. Simultaneously, SPSS 26.0 software was employed to ensure the validity and reliability of the scale following the testing phase involving sample 439 lecturers teaching engineering majors. The research findings indicated that Cronbach's alpha coefficients were above 0.7, and 38 out of 40 questions exhibited a total variable correlation of over 0.03, thereby ensuring the reliability of the scale. Furthermore, the development of this scale is poised to furnish valuable data for improving teaching activities at the higher education institutions.

Keywords: *External Assessment, Improving the Quality of Teaching, Engineering Majors, Toolkit*

INTRODUCTION

Viet Nam has dedicated 20 years to implementing guidelines and policies on quality accreditation of higher education institutions. While acknowledging the importance of quality assessment, significant attention has been given to its implementation in recent years, particularly from 2016 onwards (Nguyen.H.C, 2018). Quality accreditation in higher education not only serves as evidence of training quality for the community but also offers opportunities to improve programme quality (Le.H.T, 2020). The Ministry of Education and Training advocates for universities to engage in accreditation programs following regional and international standards such as AUN-QA, ABET, CTI, and ASIIN, etc. Universities have increasingly emphasized external assessment at both programme and university level. The assessment results help universities clearly see the overall picture of the quality of training and the results of external assessment really have a great impact on improving the quality of training programmes in general and improving teaching activities in particular (Ta,T.T.H et al., 2017).

The results and recommendations proposed by the external experts were considered by lecturers, who then strategize to improve teaching quality (Gift Sandra et al., 2007). Furthermore, external assessment results help to improve the quality of programs and increase awareness of lecturers, students, and leaders when participating in the assessment process (Johnson, O.C.B, 2017). The value that lecturers receive is understanding quality culture, contributing to quality assurance as both a responsibility and an obligation, providing opportunities to listen to stakeholders to make changes and improve on teaching (Nguyen.T.B.N. et.al., 2020). . Teaching quality has emerged as a significant concern for many researchers due to the modern technological industrial revolution, which has transformed student-teacher interactions (Darling-Hammond L. et al., 2017). Consequently, enhancing teaching quality is imperative to improve employability skills (OECD, 2008).

Recent studies in Viet Nam have illuminated the process of programmes assessment according to AUN-QA and revealed shifts in lecturer perspectives. However, further studies are warranted to tailor recommendations to the current context. The specific situation of each university or majors group needs to be researched (Nguyen, P.V. et al.,2018; Pham Thi Huong et al., 2020; Nguyen.T.B.N. et al., 2022). Hence, continued research on the impact of external assessment at the program level and solutions to enhance teaching quality in Vietnamese universities is essential..

[1] Hanoi University of Science and Technology No. 1, Dai Co Viet Road, Hai Ba Trung District, Hanoi, Viet Nam

[2] Hanoi University of Science and Technology No. 1, Dai Co Viet Road, Hai Ba Trung District, Hanoi, Viet Nam E-mail: tung.lehuy@hust.edu.vn

Surveys have been extensively utilized in science education (Blaxter L., Hughes C., and Tight M., 2001). According to Denscome, a good survey contains a list of the simplest questions, but yields the most information for subsequent data analysis (Denscombe M. 2010). Surveys should be used with large sample sizes where their direct information may yield standardized data from similar questions. We have developed a set of questionnaires to survey lecturers at technical universities. Research design aims to guide the method implemented in the research process in a logical sequence so that interpretations can be made (Creswell & Clark, 2011). This paper presents how to approach, formulate and standardize a toolkit to measure the impact of external assessment results and improve teaching activities in engineering majors at some Viet Nam universities. The questions are authenticated by Vietnamese experts and lecturers with experience in measurement and assessment in education, and knowledgeable about quality assurance in the practical context of Vietnamese higher education.

Research Methods

In order to measure the level the impact of external assessment results on improve teaching activities in engineering majors at several Viet Nam universities, we developed a tool based on research on lecturers' perceptions of teaching quality improvement activities. This research was implemented in two stages: formulating questionnaires and testing the survey questionnaire

Stage of Formulating the Questionnaire

Basis for Formulating the Questionnaire

The survey questionnaire on the impact of external assessment results on improving teaching activities in engineering majors was formulated in compliance with the requirements and principles of survey questionnaire design. The construction of the questionnaire is carried out on a theoretical basis related to external assessment and improving teaching activities to develop questions suitable for engineering programmes in Viet Nam.

Steps to Create the Questionnaire

To develop the questionnaire, qualitative methods were applied through gathering expert opinions, including multiple rounds of interviews and multiple group discussions. 06 experts with knowledge of collecting and processing quantitative data were invited to participate, including 03 experts in measurement and evaluation in education, with experience in designing survey tools and 03 experts with experience in quality assurance and accreditation. These experts are all knowledgeable about quantitative research, university teaching and learning methods.

The Process of Formulating the Questionnaire Is Carried Out as Follows

Step 1. Determine the purpose, scope, and objects to be surveyed. This questionnaire aims to find out the impact of external assessment results on improving teaching activities in engineering majors at Higher Education Institutions in Vietnam.

Step 2. Draft the content of the questionnaire. This step drafts the content of the survey based on the research framework that has been determined. After defining the key concept such as "External assessment results" includes 3 factors (1) Score ; (2) Results of strengths and (3) Results of recommendations and "improving teaching quality" include 5 factors (1) Learning outcomes, (2) Teaching and learning activities; (3) Student assessment; (4) Facilities for teaching and (5) Policy mechanisms to support lecturers. The initially designed questionnaire consisted of 50 questions, which were variable codes or observed variables from 08 factors. Using a 5-level Likert scale from 1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree. In addition, the questionnaire has more 12 information questions about the lecturers' personal characteristics, qualifications and working environment to explore impact factors.

Step 3. Draft questionnaire form. In this step, the draft form is brought up for group discussion. The discussion aims to analyze the logic of the questionnaire structure, the contents of each question and the number of questions in each factor. At the same time, this step is to check the appropriateness of response time, survey length, answering instructions, languages in the questionnaire and the comprehensibility of the question.

Step 4. Adjust and complete the questionnaire form. The first draft form was sent to get expert opinions on the content of each question; logic of questions and scales. In this step, ten questions were removed, and some sentences were worded to make it easier to understand. The questions have been arranged according to the structure of each factor group so that it is easy for answering the questionnaire.

After rounds of consultation and discussion, the questionnaire included 40 variables coded belong to eight groups of factors that were identified and evaluated on a 5-level Likert scale from from 1 = Strongly disagree to 5 = Strongly agree. The specific information is shown in Table 1:

Table 1. Criteria for measuring the impact of external assessment results on improving teaching activities in engineering majors

Factor	Code	Number of observed variables	Items
Strengths	DM1	3	I am interested in the strengths in the result of external assessment at programme level
	DM2		The strengths in the result of external assessment help me identify areas and continue to develop the quality of training
	DM3		Strengths are the basis to motivate me to constantly improve the quality of teaching
Recommendations	KN1	3	I am interested in the recommendations in the result of external assessment at programme level
	KN2		The recommendations in the result of external assessment help me reconsider the weaknesses that need to be overcome.
	KN3		The recommendations in in the result of external assessment are an important basis that motivate me to improve the quality of teaching.
Scores	DS1	3	The scores in the result of external assessment help me reconsider my teaching activities.
	DS2		The scores of standards related to teaching activities help me continuously improve the quality
	DS3		I am interested in certification programme achieved.
Learning outcomes	CDR1	6	I have reviewed and adjusted the learning outcomes according to the university 's requirements
	CDR2		I have implemented the course learning outcomes that contributes to achieving the programme learning outcomes.
	CDR3		I have adjusted the students' tasks to match the course learning outcomes
	CDR4		Using the matrix helps me determine whether all the statements in the course learning outcomes can be evaluated
	CDR5		I may evaluate the level of achievement of each student's learning outcomes
	CDR6		I have used student's feedback on learning outcomes to promptly adjust and improve quality of teaching.
Teaching and learning activities	HDDH1	6	I have adjusted the teaching method (Presentations; Problem solving, Seminars...) in accordance with the course learning outcomes.
	HDDH2		I have increased the application of teaching technology such as Microsoft Form, Google Form; Zoom; Google Classroom, etc.
	HDDH3		I have innovated teaching content to keep up with development trends in higher education
	HDDH4		I regularly update the course learning materials (electronic and paper versions)
	HDDH5		I have created many active and experiential learning opportunities for students during teaching
	HDDH6		I have used student's feedback on teaching and learning activities to promptly adjust and improve quality of teaching.
Student assessment	KTDG1	6	I have used Rubric to assess the student's tasks
	KTDG2		I have used a variety of student assessment in the course.
	KTDG3		I have designed exam questions to build the coure's question bank
	KTDG4		I have responded to student assessment results to help learners improve
	KTDG5		I have designed questions to measure the course's learning outcome statements
	KTDG6		I have used student's feedback on student assessment to promptly adjust and improve quality of teaching.

Facilities for teaching	CSVC1	6	The university has provided adequate classrooms for the courses I undertake.
	CSVC2		The classrooms are fully equipped with projectors, boards, microphones, lighting, etc.
	CSVC3		The university's wifi connection meets my teaching needs.
	CSVC4		The university has provided adequate laboratories and practice rooms for the courses I undertake.
	CSVC5		Laboratory and practice rooms are equipped with machinery and experimental materials to meet the needs.
	CSVC6		The university has equipped the room to conduct E-learning lectures
Policy mechanisms to support lecturers	HTGV1	7	I have been surveyed about the need for professional training by the university
	HTGV2		I have been assigned to participate in training courses on quality assurance, innovating teaching methods, student assessment and formulating learning outcomes.
	HTGV3		My training and professional development activities are funded by the university
	HTGV4		I am rewarded when I successfully complete tasks according to the school year.
	HTGV5		I have the opportunity to strive to achieve noble titles such as Professor/Associate Professor, main lecturer, senior lecturer, ect.
	HTGV6		I have the opportunity to be promoted and have the opportunity to develop my teaching career
	HTGV7		I am satisfied with the salary I receive for it.
Total: 8 factors and 40 items			

After the rouds of expert opinion and group discussion, then tested with a large group of 439 lecturers from engineering majors to check the reliability of the scale. This stage also involves exploratory factor analysis using SPSS 26.0.

The Experiment Phase

Assessing the reliability of the scale through two indicators: Cronbach's Alpha coefficient and the correlation coefficient of each item with the remaining variables of the scale, referred to as the correlation coefficient with the total variable. Then Assessing validity using exploratory factor analysis (EFA).

Analyze The Reliability of The Scale

Theoretical basis: When Cronbach's Alpha is from 0.8-1.0, the scale is excellent, from 0.7-0.8 is good, from 0.6-0.7 is usable and less than 0.6 should be excluded from the questionaire. In adition, the observed variables with correlation coefficient less than 0.3 were considered as garbage variables, also removed from the scale of individual factors (Nunnally, 1994).

According to table 2, Cronbach's Alpha results showed that the total correlation coefficient of the variables is greater than 0.7. Thus, the questionaire is qualified to ensure the reliability with typical variables.

Table 2. Results of assessing the reliability of the scale

Factor	Code	Cronbach's Alpha	Cronbach's Alpha if item deleted	Corected item- Total correlation
Strengths	DM1	0.758	0.764	0.510
	DM2		0.558	0.689
	DM3		0.693	0.573
Recommendations	KN1	0.811	0.738	0.664
	KN2		0.711	0.690
	KN3		0.774	0.629
Scores	DS1	0.783	0.777	0.554
	DS2		0.578	0.734
	DS3		0.747	0.583
Learning outcomes	CDR1	0.810	0.815	0.422
	CDR2		0.765	0.636
	CDR3		0.760	0.661
	CDR4		0.773	0.603

	CDR5		0.779	0.577
	CDR6		0.787	0.537
Teaching and learning activities	HDDH1	0.881	0.878	0.583
	HDDH2		0.860	0.697
	HDDH3		0.855	0.725
	HDDH4		0.851	0.753
	HDDH5		0.857	0.712
	HDDH6		0.863	0.681
Student assessment	KTDG1	0.797	0.755	0.597
	KTDG2		0.749	0.626
	KTDG3		0.758	0.588
	KTDG4		0.802	0.384
	KTDG5		0.764	0.562
	KTDG6		0.766	0.553
Facilities for teaching	CSVC1	0.887	0.874	0.659
	CSVC2		0.868	0.700
	CSVC3		0.868	0.702
	CSVC4		0.865	0.716
	CSVC5		0.862	0.735
	CSVC6		0.868	0.699
Policy mechanisms to support lecturers	HTGV1	0.710	0.717	0.248
	HTGV2		0.675	0.430
	HTGV3		0.617	0.639
	HTGV4		0.618	0.649
	HTGV5		0.628	0.633
	HTGV6		0.645	0.535
	HTGV7		0.788	-0.094

After eliminating 2 items that did not meet the requirement, are HTGV1 = 0.248 and HTGV7 =- 0.094, due to the total correlation coefficient is less than 0.3. The table 2 show that the Cronbach's Alpha of all factors of the scale is highly reliable, the reliability of all factors is greater than 0.7. The reliability of the highest factor is 0.887 (Facilities for teaching) and the reliability of the lowest factor is 0.710 (Policy mechanisms to support lecturers). Thus, the total number of initial variables included in the evaluation was 40, the number of variables that did not meet the reliability requirement and were eliminated was 2 items, the remaining qualified variables were 38 items met the requirements, belonging to 08 factors. The scale has good reliability, the questions focus on understanding the correct content to be measured. Thus, the questionnaires are qualified to conduct surveys and evaluate information in terms of reliability.

Analyze Explore Factor Analysis (EFA)

Theoretical basis: Conditions for Explore Factor Analysis (EFA) analysis must satisfy the following requirements: i) Factor loading coefficient >0.3; ii) KMO coefficient is in the range of 0.5≤KMO≤1; iii) Bartlett's test has statistical significance (Sig <0.05); iv) Percent total variance is >50%. The number of basic factors depends on the research method in which they are bound by rotating orthogonal vectors so that correlation does not occur. Meyer et al. (2016) reported that in the EFA, the principal component analysis extraction method with varimax rotation is the most commently used method.

Results of exploratory factor analysis:

Testing the appropriateness of EFA The results of KMO analysis (Kaiser-Meyer-Olkin) and Bartlett's test (Bartlett's test of sphericity) are shown in Table 3, KMO coefficient=0.911 satisfies the condition 0.5≤KMO≤1. Thus, exploratory factor analysis is appropriate for the data (Hair et al., 1998).

Bartlett's test results with statistical significance level Sig=0.00<0.05. Thus, the correlation between observed variables is zero in the population is rejected, that means the observed variables are correlated with each other in the population.

Table 3. KMO and Bartlett's Test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.911
Bartlett's Test of Sphericity	Approx. Chi-Square	11375.065
	df	703
	Sig.	.000

EFA Analysis Results

Total variance extracted = 68.9% that means 68.9%>50%, so total variance extracted meets the requirements, 8 groups of factors explain 68.9% of the variation of the data. This shows that the EFA analysis results are completely consistent. Through testing the quality of the scale and the results of EFA analysis shown in table 4:

Table 4. Rotated Component Matrix

Factors	Code	*Rotated Component Matrix*							
		1	2	3	4	5	6	7	8
Strengths	DM1	0.590							
	DM2	0.620							
	DM3	0.604							
Recommendations	KN1		0.651						
	KN2		0.631						
	KN3		0.585						
Scores	DS1			0.662					
	DS2			0.777					
	DS3			0.604					
Learning outcomes	CDR1				0.526				
	CDR2				0.724				
	CDR3				0.715				
	CDR4				0.594				
	CDR5				0.796				
	CDR6				0.807				
Teaching and learning activities	HDDH1					0.499			
	HDDH2					0.614			
	HDDH3					0.632			
	HDDH4					0.704			
	HDDH5					0.648			
	HDDH6					0.656			
Student assessment	KTDG1						0.663		
	KTDG2						0.661		
	KTDG3						0.586		
	KTDG4						0.574		
	KTDG5						0.633		
	KTDG6						0.613		
Facilities for teaching	CSVC1							0.556	
	CSVC2							0.591	
	CSVC3							0.587	
	CSVC4							0.614	
	CSVC5							0.796	
	CSVC6							0.807	
Policy mechanisms to support lecturers	HTGV2								0.424
	HTGV3								0.663
	HTGV4								0.690
	HTGV5								0.669
	HTGV6								0.547

The results of EFA analysis show that the necessary condition for applying factor analysis is satisfied when the coefficient Sig Bartlett's test = 0.000, proving that the observed variables are correlated with each other in the factor, KMO coefficient = 0.911 so that It meets the sufficient conditions to show the factor analysis is appropriate, total variance extracted = 68.9%, showing that the EFA model is appropriate. The new survey includes 38 observed variables (02 eliminated variables are HTGV1 and HTGV7 variables), so the model has 08 factors identified as: (1) Strengths (3 observed variables); (2) Recommended 3 observed variables). (3) Recommendation (3 observed variables); (4) Output standards (6 observed variables); (5) Teaching activities (6 observed variables); (6) Evaluation testing (6 observed variables); (7) Teaching facilities (6 observed variables); (8) Policy mechanism to support lecturers (5 observed variables) as shown table 5.

Table 5. Development toolkit

Group	Factor	Code
External assessment result	Strengths	DM1; DM2;DM3
	Recommendations	KN1; KN2; KN3
	Score	DS1; DS2; DS3
Improving the quality of teaching	Learning outcomes	CDR1; CDR2; CDR3; CDR4; CDR5; CDR6;
	Teaching and learning activities	HDDH1; HDDH2; HDDH3; HDDH4; HDDH5; HDDH6
	Student assessment	KTDG1; KTDG2; KTDG3; KTDG4; KTDG5; KTDG6
	Facilities for teaching	CSVC1; CSVC2; CSVC3; CSVC4; CSVC5; CSVC6
	Policy mechanisms to support lecturers	HTGV2; HTGV3; HTGV4; HTGV5; HTGV6

Thus, the results of EFA analysis have identified 08 factors corresponding to 38 appropriate variable codes, that means the questionaire meet the requirement and develop a toolkit of the impact of external assessment results on improving teaching activities in engineering majors scale. The model after EFA analysis in Table 5 is not much different from the initial questionaire, only reducing 2 observed variables.

CONCLUSION

This toolkit has been successfully developed based on the theoretical framework concerning the impact of external assessment results on improving teaching quality within the context of Vietnam's educational lanscape. The questions were meticulously determined by experts and underwent several rounds of consultation and group discussions. Subsequently, the questionnaire underwent testing among a cohort of 439 lecturers specializing in the engineering major to ascertain its reliability and validity.

The questionnaire's structure was organized into groups, and the questions underwent rigorous reliability testing and factor analysis. Following reliability testing, all factor groups demonstrated high reliability scores exceeding 0.7. The reliability testing was conducted on a large scale and diverse sample, ensuring that the questionnaire is highly dependable and suitable for surveying lecturers across higher education institutions.

The results derived from the questionnaire provide a scientific and practical basis for formulating and improving the quality of teaching at higher education institutions. Thereby, it will contribute to improving training quality and promoting quality assessment activities of programmes. At the same time, the quality culture is spread to lecturers to improve the quality of teaching in particular and improve the quality of programmes in general.

REFERENCES

Blaxter L., Hughes C.,&Tight M. (2001). How to research, Buckingham. Journal of advanced nursing, ISBN 0335209033. Open University Press.

Creswell J. W. & Clark Plano V. L. (2011). Designing and conducting mixed methods research, 2nd edThousand Oaks, California, SAGE Publications.

Darling-Hammond L., et al. (2017). Effective Teacher Professional Development, Palo Alto, CA: Learning Policy Institute.

Denscombe M. (2010). The good research guide: for small-scale social research projects, Maidenhead, Open University Press.

Gift,S. et al. (2007). Quality assurance and the imperatives for improved student experiences in higher education: The case of the University of the West Indies, Quality in higher Education, 13 (2), 145-157.

Hair,J.F., Anderson,R.E.,Tatham,R.L.,&Black, W.C. (1998). Multivariate Data Analysis.

Johnson, O.C.B. (2017). The Impact of ASEAN University Network-Quality Assurance (AUN-QA), Assessment on the Quality of Educational Programmes. In Theory and Practice of Quality and Reliability Engineering in Asia Industry (pp. 87-97). Springer, Singapore.

Jam, F. A., Singh, S. K. G., Ng, B., & Aziz, N. (2016). Interactive effects of Gender and Leadership Styles on Open Service Innovation: A Study of Malaysian Doctors, International Journal of Economics Research, 13(3), 1287-1304.

Le,H.T. et al.(2020). Solutions to improve the quality of programme at Hanoi University of science and technology, Educational Equipment Magazine, No. 215, issue 2, April 2020, pp. 92-94.

Meyers,L.S., Gamst, G.,&Guarino,A.J.(2016). Applied multivariate Research: Design and Interpretation.

Hayat, S., Ahmad, A., Yahiya, M., & Khan, T. (1996). Ageing effect on the germinability and loss of solutes from the seeds of chickpea (Cicer arietinum L.) cultivars.

Nguyen,H.C (2018). Advantages and disadvantages when implementing higher education quality accreditation in the period 2017 - 2020, HNUE journal of Educational Sciences, 2018, Vol. 63, Iss. 2, p. 17-26.

Nguyen, H. C., Ta, T. T. H., & Nguyen, T. T. H.(2017). Achievements and lessons learned from Vietnam's higher education quality assurance system after a decade of establishment, International Journal of Higher Education, 6(2), 2017, pp 153-161.

Nguyen,P.V .et al (2018). The impact of assessing the quality of programs on the awareness and attitudes towards teaching activities of lecturers at the University of Social Sciences and Humanities, Ho Chi Minh National University. Science & Technology Magazine No. 1.

Nguyen, T.B.N. et al. (2020). External assessment support activities according to AUN-QA standards: Experience from Hanoi University of Science and Technology. University of Education, first international conference on assessment and measurement in education. P.647-662.

Nguyen,T.B.N. et al. (2022). Implementation of teaching quality improvement based on AUN-QA- Lecturers survey, HaFPES international conference, 2nd Hanoi Forum on pedagogical and educational sciences, University of Education, Hanoi National University in association with Vietnam Institute of Educational Sciences, ISBN:978-604-342-795-0.

Nunnally. et al.(1994). A catastrophe model for developing service satisfaction strategies. Psychometric Theory.

OECD (2008), Learning our lesson: review of quality teaching in. Institutional Management in Higher Education.

Pham,T.H. &Nguyen.V.P. (2020). The impact of evaluating training programs according to the AUN-QA standards set: Instructors' perspectives. Ho Chi Minh City Open University Science Magazine, 15(2), pp.3-18.

Ta,T.T.H, et al. (2017). Achievements and Lessons Learned from Vietnam's Higher Education Quality Assurance System after a Decade of Establishment, International Journal of Higher Education. ISSN 1927-6044 (Print) ISSN 1927-6052.