



Research Article

STUDY ON CRITERIA TO EVALUATE RESEARCH PROJECTS IN EDUCATIONAL SCIENCE

IN LINE WITH INTERNATIONAL STANDARDS

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ABSTRACT

This study focused on finding out the criteria to evaluate research projects in education. We used a mixed methods research, including a literature review, focus group interviews with experts, and a survey of 140 lecturers from 5 universities of education in Vietnam and 33 lecturers who are teaching four majors from the University of Education, Vietnam National University. The necessity, suitability, and reliability of the set of criteria in evaluating the thesis in the field of educational science were examined. Two independent experts reviewed 146 master theses based on the set of criteria. The results showed that the evaluation of the 2 experts for 38 evaluation criteria is very similar, matched 85.6% to 100%. The Kappa correlation coefficient was above 0.7. The set of criteria is highly reliable in evaluating the quality of scientific projects.

Keywords: criteria; international standards; educational science; evaluation; literature review

1. Introduction

According to the classification of science and technology research in Vietnam, educational science belongs to social sciences. Educational science includes general education, pedagogy, educational theory, and special education (i.e., people with disabilities) and other educational issues (Ministry of Science and Technology, 2008). In the world, the criteria for evaluating research in general and research in the field of education, in particular, are clear. The clarity is reflected in the research works and the proposed evaluation criteria as well as the requirements of research projects. Some authors (Stiles, 1993; Wu, Thompson, Aroian, McQuaid, & Deatrck, 2016; Fossey, Harvey, McDermott, & Davidson, 2002; Anderson, 2010; McMillan & Wergin, 1998; Clissett, 2008; Howe & Eisenhart, 1990; Malterud, 2001; Taylor, Beck, & Ainsworth, 2001;

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Horsburgh, 2003; Sukamolson, 2010) have proposed a system of criteria for evaluating research, which includes qualitative and quantitative studies.

Regarding the current status of evaluating scientific research in Vietnam, Vu (2014) mentioned the irrationality in passing a project, along with the set of criteria to assess the results. Tran (2007) considers that the evaluation of the council is based on the following criteria: novelty in science, the authenticity of the results, the suitability of the methodology, and the applicability of the project. There are many unreasonable points, which are not suitable for scientific research. For example, a project may be considered low-quality by the council because it is contrary to the scientific perspective of the majority of its members although it has the prospect of opening a new research direction. It can be seen that, in reality, up to now, many unreasonable things still exist in evaluating research. Therefore, a number of authors have investigated and piloted some sets of criteria to evaluate research projects or products (Nguyen, 2008; Tran, 2013).

In Vietnam, firstly, in research report forms, most requirements in the report are still formal, many parts are duplicated, while the core and essential components such as research questions, methods, reliability, validity of the research tools, discussion, data processing have not received enough attention. Secondly, the existing criteria were established based on a small sample size and applied for sciences or social sciences in general (but not specifically for educational sciences). The development of the criteria for each specific industry is still lacking (Tran, 2013). Moreover, there has been limited research projects on developing criteria for evaluating educational research projects in line with international standards. Therefore, this study aims to develop a set of criteria for assessing research projects in education in line with international standards, contributing to improving the quality of education research, supporting the management agencies during the evaluation process of educational projects, promoting the development of quantity and quality of international publications.

2. Methodology

A mixed methods research was used in the current study, including a literature review, focus group interviews with experts, and a survey. An overview of the scientific research related to this topic was established. Based on the analysis of the interviews with the experts and focus group discussions, 11 core criteria and 45 specific criteria to evaluate the quality of master thesis in educational Science were proposed.

2.1. Procedure

By using surveys, we collect information from experts (lecturers, managers) about the necessity of the criteria set in evaluating master thesis in the field of educational sciences through a questionnaire with $0 = Unnecessary$, $1 = Somewhat\ necessary$, $2 = Necessary$, and $3 = Completely\ necessary$.

Developing and testing, and forming the evaluation criteria: (1) Literature review, (2) In-depth interview with two lecturers (1 person with more than 30 years of experience and another with over ten years of working experience), and (3) Focus group (six lecturers). All of the participants have postgraduate qualifications and have more than 15 years of working experience.

We tested the criteria on 146 completed theses (from four majors of the VNU University of Education, Vietnam National University, Hanoi) which were selected randomly over the years.

Test procedure

Step 1: Build a checklist based on the criteria

Step 2: Prepare the data (146 theses in VNU University of Education, Vietnam National University, Hanoi)

Step 3: Contact two experts, send the experts the checklist, and 146 theses. The two experts evaluated them independently.

Step 4: Collect the evaluation results from the two experts.

Step 5: Enter data into SPSS 22.0

Step 6: Analyze and report the results

The checklist was constructed using the scale with three answering options: 0 = None, 1 = Present but not clear (there is a bit), 2 = Present and clearly expressed.

2.2. Sample

Collecting data: 150 lecturers of 5 Universities (Hanoi National University of Education; Thai Nguyen University of Education; Da Nang University of Education, Hue University of Education, Ho Chi Minh City University of Education).

Collecting data (the second time) at the VNU University of Education, Vietnam National University, Hanoi: 35 lecturers who were teaching educational majors such as educational management; theory and teaching methods; children and adolescent clinical psychology, and measurement and evaluation in education.

2.3. Developing the criteria for evaluating theses in the field of educational science

First, an overview of scientific research related to the research was built. Then the opinions of experts through semi-structured interviews were analyzed. We have proposed 11 core criteria and 45 specific criteria to evaluate the quality of master thesis in the field of educational science (Table 1).

Table 1. The development of the evaluation criteria

Criteria		Source
<i>A1. Title</i>		
A1.1	Reflect the main content (independent and dependent variables) of the study	O'Brien et al. (2014) Sukamolson (2010)
A1.2	Mention the participants and the study areas	Qualitative research
<i>A2. Abstract</i>		
A2.1	Accurately reflect the content of the study	Qualitative research
A2.2	The author addresses the problems they intentionally solve	Qualitative research
A2.3	The author briefly stated how to organize and research methods	Wu (2016) O'Brien et al. (2014)
A2.4	The author briefly stated the main results of the study	
<i>A3. Introduction</i>		
A3.1	Describe the reason (theoretical and practical basis): why it is selected as a research problem	Nair et al. (2014)
A3.2	The purpose of the study: they do this study for what?	Qualitative research
A3.3	The main content needs to be expressed in the form of a question to answer	Qualitative research
<i>A4. Literature review</i>		
A4.1	Overview of studies related to the content of the topic (independent and dependent variables)	Qualitative research
A4.2	Point out what has been done and research gaps (things that have not been done yet) in relevant studies	Russell (2005) Qualitative research
A4.3	Identify the main concepts of the study	Russell (2005)
A4.4	Identify the theoretical content related to the study	Creswell (2002)
<i>A5. Research procedure</i>		
A5.1	Describe steps in conducting the study	Qualitative research
A5.2	Describe the sampling procedure and the characteristics of the sample	Frankel and Devers (2000) O'Brien et al. (2014)
<i>A6. Methodology</i>		
A6.1	Methods of conducting research methods (approach to the research subjects, methods to collect data)	Russell (2005) Qualitative research
A6.2	Describe research tools (selection, development, adaptation, reliability, and validity)	Nair et al., 2014
<i>A7. Data analysis and interpretation</i>		
<i>For quantitative research</i>		
A7.1	Statistical analysis is consistent with research questions, hypotheses, variables, and measurement tools	Frankel and Devers (2000) Russell (2005)

	Criteria	Source
A7.2	Analyze appropriate data to solve research problems	Creswell (2002)
A7.3	The data is fully presented in tables and charts	Qualitative research Russell (2005)
A7.4	The results correctly answer the research question, and/or hypothesis	Qualitative research
<i>For qualitative research</i>		
A7.5	Practical and accurate results answer to the research questions	Frankel and Devers (2000) O'Brien et al. (2014)
A7.6	The data analysis steps are used to draw conclusions based on evidence	Redfield (2004)
A7.7	The results are presented in themes and categories so that multi-dimensional perspectives can be easily seen	Redfield (2004)
<i>For empirical research</i>		
A7.8	The study clearly describes the experimental / intervention procedure (including (i) implementer/supervisor, recipient, and cost of implementation; (ii) what are the differences between the experiment and control group; and (iii) how the logic of the intervention might affect the outcome).	Creswell (2002) Redfield (2004)
A7.9	Experimental and control groups were randomly selected	Redfield (2004)
A7.10	There was a similarity in signs between the experimental group and the control group before the experiment	Qualitative research
A7.11	The instrument accurately measures the variables affected by the intervention	Redfield (2004)
A7.12	The stability of the number of participants in experimental research should be ensured	Qualitative research
A7.13	The study collected data on the long-term results of the intervention, showing that the impact of the intervention was sustained over time.	Redfield (2004)
A7.14	State the effective scope of intervention	Qualitative research
<i>A8. Discussion</i>		
A8.1	The author compares the main results with the published data, in the most objective way possible	Creswell (2002) Russell (2005) O'Brien et al. (2014)
A8.2	The author discusses the limitations of the research and highlights what they have done	Creswell (2002) Nair et al., 2014
A8.3	Analyze the advantages and limitations of the current situation of the research problem, providing the foundation for the proposed solutions.	Russell (2005)

Criteria		Source
<i>A9. Conclusions and recommendations</i>		
A9.1	The author repeated the research question and commented on the level to which it was solved.	Creswell (2002)
A9.2	The author makes recommendations to overcome such limitations or provides future research directions	Nair et al., 2014
<i>A10. Some requirements for presenting research</i>		
<i>For quantitative research</i>		
A10.1	The structure of the research is generally consistent with the topics covered in a quantitative study	Qualitative research
A10.2	The terms social science and education are dependably defined	Redfield (2004)
A10.3	Variables are labeled (named) throughout the study	Qualitative research
A10.4	The research report uses extensive references	Qualitative research
A10.5	The report is presented in accordance with the target audience (readers)	Qualitative research
<i>For qualitative research</i>		
A10.6	The report is scientifically written	Qualitative research
A10.7	The report is not written from an individual standpoint	Qualitative research
A10.8	The written report includes metaphors, unexpected details, details, complicated conversations	Qualitative research
A10.9	The report is made in a consistent and logical way between scientific hypotheses, questions, and research results.	Qualitative research
<i>A11. About the presentation structure:</i>		
0. Abstract (1 page)	1.11. New contributions to the study	
1. Introduction	1.12. The structure of the study	
1.1. Reason to choose a topic/issue	2. Theoretical framework	
1.2. Research objectives	2.1. Literature review	
1.3. Research questions	3. Organization and research methods	
1.4. Study hypotheses	3.1. Research organization (process, sampling)	
1.5. Study tasks	3.2. Research methodology (describe in detail)	
1.6. Methodology	4. Results	
1.7. Participants	5. Discuss (analyze) research results	
1.8. Research objects	6. Conclusions and recommendations	
1.9. Scope of the study	References	
1.10. Research plan	Appendix	

3. Results

3.1. The views on the necessity of the evaluation criteria for scientific research in educational science

In the focus group, the experts discussed the necessity and suitability of each criterion in the survey. The results showed that the experts concur and evaluate good for the majority of the criteria. However, according to the experts' opinions, it is advisable to eliminate some unclear criteria and some demanding requirements for the master thesis.

Table 2. The summary of the ideas by experts on the criteria

No.	Criteria	The number of expert opinions agreed to eliminate the criteria
A2.2	The author addresses the problems they intentionally solve	6/6 (removed because A2.1 already covers this content)
A3.3	The main content needs to be expressed in the form of a question to answer	5/6 (suitable for Ph.D. degree)
A7.4	The results correctly answer the research question, and/or hypothesis	5/6 (in fact the results prove the opposite)
A7.6	The data analysis steps are used to draw conclusions with evidence	4/6
A8.3	Analyze the advantages and limitations of the current situation of the research problem, providing the foundation for the proposed solutions.	6/6 (suitable for Ph.D. degree)
A10.4	The research report uses extensive references	5/6 (suitable for Ph.D. degree)
A10.8	The written report includes metaphors, unexpected details, details, complicated conversations	6/6 (suitable for Ph.D. degree)

The majority of lecturers agreed with a high level (71% to 100%) for the necessity of criteria to evaluate theses in educational science. This is an important basis for us to recommend the University of Education, Vietnam National University, Hanoi to apply the criteria in an official survey at four specialized faculties of the University of Education, Vietnam National University, Hanoi.

In terms of content, the results on the necessity of the criteria (according to 140 lecturers at five pedagogical universities) showed that the majority of lecturers reported that the criteria set was necessary with a high rate (from 73.7% or more). However, there are two criteria: *The authors repeat the research question and confirm the resolution level of the question* and *the report was not written in personal opinion* had a low rate of agreement, 64.2% and 68.1% respectively. These per cents can be explained by the fact that there are studies that only require hypotheses, and then research questions are not necessary.

We evaluated the reliability of a set of criteria using Cronbach's Alpha. According to Nunnally and Bernstein (1994), if Cronbach's $\alpha \geq 0.60$, the scale is acceptable in terms of reliability. The criteria set has Cronbach's α of 0.915. Thus, it can say that the criteria set is reliable and can be surveyed officially at the University of Education. We organized an official survey at the University of Education, summarizing the results of the comments of 33 lecturers who were teaching educational majors such as educational management, theory and teaching methods, children and adolescent clinical psychology and measurement, and evaluation in education. Most of the faculty members agreed at high levels of from 75.8% to 100% that the criteria set are necessary except for two items: *abstract (about 1 page)* and a *research plan*. The percentage of lecturers viewed them as necessary is not high (66.7%). Still, 33.3% of lecturers said that it is not necessary. These items are required in the master theses. This can be completely explained by the fact that the master thesis that has been saved so far has no abstract (1 page) as well as a research plan. This is also a new point in this study that we would like to mention.

The results of the necessity of the set of criteria (according to 33 lecturers at the University of Education) showed that the majority of lecturers thought that the criteria set was necessary with a high percentage (from 71% or more). However, there are still some criteria with the low level of agreement. For example, in the title/topic section, the criterion *requiring to refer the participants and study areas* has a low level of agreement (42.0%), and 54.8% thought it was a bit necessary. For the criterion: *results presented by topics and multi-dimensional perspectives can be easily seen by*, the proportion of lecturers viewing it as necessary is 68.8%, and 25 % of lecturers said it was not necessary. The criterion: *need to ensure stability in the number of participants in the experimental study has a low level of agreement* (64.5% disagreed).

The data collected from 33 lecturers from the University of Education showed that the set of criteria has the Cronbach's α of 0.659, indicating acceptable reliability. Typically, if Cronbach's Alpha coefficient ranges from 0.8 to 1.0, the measurement is considered to be good. However, according to some researchers, the Cronbach Alpha coefficient of 0.6 or higher can be used in tests (Peterson, 1994; Slater, 1995). Combined with the high concurrence of the necessity of the criteria set through 140 lecturers from 5 pedagogical universities and the agreement of 33 lecturers in charge of teaching subjects in 4 majors of the University of Education, it can be affirmed that the set of criteria is appropriate and has sufficient face reliability and criterion reliability so that the testing can be applied to the master thesis of the University of Education.

3.2. *Pilot and data analysis*

Table 3. The percentage table is similar and correlated between two lecturers evaluating the structure of the thesis (146 master theses)

Structure of the thesis	Percentage of similarities	Kappa correlation coefficient
Abstract (1 page)	100%	-
1. Introduction	100%	-
1.1. Reason to choose a topic/issue	100%	-
1.2. Research objectives	99.3%	0.797
1.3. Research questions	100%	-
1.4. Study hypotheses	100%	-
1.5. Study tasks	100%	-
1.6. Methodology	100%	-
1.7. Participants	100%	-
1.8. Research objects	100%	-
1.9. Scope of the study	98.6%	0.826
1.10. Research plan	100%	-
1.11. New contributions to the study	97.3%	0.939
1.12. The structure of the study	99.3%	0.797
2. Theoretical framework	99.3%	-
2.1. Literature review	100%	-
3. Organization and research methods	95.2%	0.823
3.1. Research organization (process, sampling method)	98.6%	0.969
3.2. Research methodology (describe in detail)	100%	-
4. Results	100%	-
5. Discuss (analyze) research results	99.3%	-
6. Conclusions and recommendations	100%	-
References	100%	-
Appendix	100%	-

The results showed that the evaluations of the two lecturers on 23 items in the thesis are very similar, the percentage of agreement ranged from 95.2% to 100%. The Kappa correlation coefficients are all over 0.7, there are items that cannot produce results when running the correlation coefficients because the data have no variations or the margin is too small. It can be seen that the evaluation results of the two lecturers in the content of the theses are quite accurate. Kappa (K) is a coefficient used to evaluate the percentage of consensus between two people (two raters) when assessing the same content (problem) after eliminating the role of risk. According to Viera and Garrett (2005), the $K > 0.61$ is similar from the good level upwards. Specifically, the K:

Kappa	Agreement
<0	Poor
0.01 - 0.20	Slight
0.21 - 0.40	Fair
0.41 - 0.6	Moderate
0.61 - 0.80	Substantial
0.81 - 0.99	Almost perfect

The results in Table 4 showed that the evaluation opinions of the two lecturers on 38 criteria are very similar, the percentage of similarities ranged from 85.6% to 100%; Kappa correlation coefficients are over 0.7. It can be seen that when using the set of criteria in evaluating the thesis of educational science at the University of Education, the evaluation results of the two lecturers are quite similar. These results confirm the high reliability of the criteria set.

Table 4. Percentage of similarities and correlation between the two lecturers' evaluations (146 theses)

Criteria	Percentage of similarities (%)	Kappa correlation coefficient	
Title	B2.1. Reflects the main content (independent and dependent variables) of the study	85.6	-
	B2.2. Referring to the object and study area	92.5	0.847
Abstract (1 page)	B2.3. Accurately reflect the content of the study	100	-
	B2.4. The author briefly stated how to organize and research methods	100	-
	B2.5. The author briefly stated the main results of the study	100	-
Introduction	B2.6. Describe the reason (theoretical and practical basis) why it is selected as a research problem	85.6	0.711
	B2.7. The purpose of the study is to answer the question: they do this study for what?	93.8	0.762
Literature review	B2.8. Overview of studies related to the content of the topic (independent and dependent variables)	89.7	0.826
	B2.9. Point out what has been done and research gaps (things that have not been done yet) in relevant studies	89.0	0.828
	B2.10. Identify the main concepts of the study	94.5	-

	Criteria	Percentage of similarities (%)	Kappa correlation coefficient
	B2.11. Identify the theoretical content related to the study	92.5	-
Research organization	B2.12. Describe the steps to conduct the study	89.0	0.780
	B2.13. Describe the sampling procedure and describe the characteristics of the sample	86.3	0.769
Methodology	B2.14. Methods of conducting research methods (approach to the research subjects, methods to collect data)	87.7	0.757
	B2.15. Describe research tools (selection, development, adaptation, reliability and validity)	98.6	0.958
Data analysis in quantitative research	B2.16. Consistent statistical analysis, consistent with research questions, hypotheses, variables, and measurement tools	92.5	0.860
	B2.17. Analyze appropriate data to solve research problems	94.5	0.898
	B2.18. The data is fully presented in tables and charts	98.6	0.972
Data analysis in qualitative research	B2.19. The results correctly answer the research question, and / or hypothesis	100	-
	B2.20. The results are presented in themes and categories so that multi-dimensional perspectives can be easily seen	100	-
Data analysis in empirical research	B2.21. The study clearly describes the experimental / intervention procedure (including (i) implementer/supervisor, recipient, and cost of implementation; (ii) what is the difference between the experiment and control group; and (iii) how the logic of the intervention might affect the outcome). A7.9 Experimental and control groups were randomly selected	93.2	0.871
	B2.22. Experimental and control groups were randomly selected	100	-
	B2.23. There was a similarity in signs between the experimental group and the control group before the experiment	100	-
	B2.24. The instrument accurately measures the variables affected by the	100	-

	Criteria	Percentage of similarities (%)	Kappa correlation coefficient
	intervention		
	B2.25. The stability of the number of participants in experimental research should be ensured	100	-
	B2.26. The study collected data on the long-term results of the intervention, showing that the impact of the intervention was sustained over time.	100	-
	B2.27. State the effective scope of intervention	99.3	0.986
Discussion	B2.28. The author compared the main results with the published data, in the most objective way possible	100	-
	B2.29. The author discusses the limitations of the research and highlights what they have done	100	-
Conclusion and recommendation	B2.30. The author repeated the research question and commented on the level to which it was solved.	89.7	0.773
	B2.31. The author makes recommendations to overcome such limitations or provide future research directions	89.7	0.734
Some requirements for the presentation of quantitative research	B2.32. The structure of the research is generally consistent with the topics covered in a quantitative study	94.5	0.870
	B2.33. The terms social science and education are defined grounded	94.5	0.640
	B2.34. Variables are labeled (named) throughout the study	97.9	-
	B2.35. The report is presented in accordance with the target audience (readers)	100	-
Some requirements for qualitative research presentation	B2.36. The report is scientifically written	100	-
	B2.37. The report is not written from an individual standpoint	100	-
	B2.38. The report is made in a consistent and logical manner between scientific hypotheses, questions, and research results.	100	-

4. Recommendation and conclusion

The results showed that the criteria set have high reliability. In addition, the criteria set can be used as a basis for instructors to guide students to conduct research, write reports (master thesis) more easily. The set of evaluation criteria should be made public for students from the start of their study, and this will help learners be more active in determining their study pathways, acquire knowledge, and have a good orientation in the writing process. The set of criteria can be replicated to evaluate dissertations and theses in the field of educational science.

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**CƠ SỞ KHOA HỌC CỦA BỘ TIÊU CHÍ ĐÁNH GIÁ CÔNG TRÌNH
NGHIÊN CỨU KHOA HỌC GIÁO DỤC THEO CHUẨN QUỐC TẾ**

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TÓM TẮT

Nghiên cứu tập trung trình bày cơ sở khoa học của hệ thống tiêu chí đánh giá các công trình nghiên cứu khoa học giáo dục theo chuẩn quốc tế. Chúng tôi sử dụng kết hợp nghiên cứu lý luận với phỏng vấn, thảo luận nhóm chuyên gia, khảo sát 140 giảng viên của 5 trường đại học sư phạm tại Việt Nam và 33 giảng viên phụ trách giảng dạy các bộ môn thuộc 4 chuyên ngành của Trường Đại học Giáo dục. Mức độ cần thiết, sự phù hợp, độ tin cậy của bộ tiêu chí trong việc đánh giá luận văn thuộc lĩnh vực khoa học giáo dục đã được kiểm tra. Hai chuyên gia tích kiểm độc lập 146 luận văn dựa vào bộ tiêu chí, kết quả cho thấy ý kiến đánh giá của 2 chuyên gia đối với 38 tiêu chí đánh giá rất tương đồng với nhau, tỉ lệ trùng khớp nhau từ 85,6% đến 100%. Hệ số tương quan Kappa đều trên 0,7. Bộ tiêu chí có độ tin cậy cao trong đánh giá chất lượng công trình khoa học.

Từ khóa: tiêu chí; chuẩn quốc tế; khoa học giáo dục; đánh giá; cơ sở khoa học