THAI NGUYEN UNIVERSITY UNIVERSITY OF EDUCATION

TRAN TRUNG TINH

DEVELOPMENT OF MATHEMATICS STUDENT TEACHER'S COMPETENCE OF STUDENTS' PERFORMANCE ASSESSMENT

Major: Theory and Methodology of Mathematics Teaching

Code: 9140111

DISSERTATION SUMMARY

Thai Nguyen - 2020

The dissertation was finished at:

THAI NGUYEN UNIVERSITY – UNIVERSITY OF EDUCATION

Supervisors: 1. Prof. Dr Nguyen Huu Chau

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The dissertation will be defended in the university committee: THAI NGUYEN UNIVERSITY – UNIVERSITY OF EDUCATION At.....2020

The dissertation can be read at:

- National library of Vietnam;
- Thai Nguyen University Learning Resource Center;
- Library of University of Education.

LIST OF REFERENCES

International publications (02)

- Trinh Thanh Hai, Tran Trung Tinh (2017). Building Capacity Framework of Mathematics Teacher in assessment of High School Students in Vietnam. Annals. Comput er Science Series. 15th, Tome 1st. (B+), Romania, pp. 179-185.
- 2. Trinh Thanh Hai, Tran Trung Tinh (2016). Some Teachers' Technical in Assessing Pupils' Learning Mathematics Process in Vietnam. Annals. Comput er Science Series. 14th, Tome 1st, 2016. Romania, pp.30-34.

National publications (03)

- 1. Tran Trung Tinh, Nguyen Huu Hau (2019). Research about framework of students' ability to evaluate math learning outcomes of high school students. Educational Sciences, HNUE Journal Of Science. 2019, Vol. 64, Iss. 7, pp. 110-119.
- Tran Trung Tinh (2019). Current of students' assessment competence about assessment of pupil's learning outcomes at high school. Educational Sciences, HNUE Journal Of Science. 2019, Vol. 64, Iss. 4, pp. 110-119.
- 3. Tran Trung Tinh, Nguyen Huu Hau, Trinh Thanh Hai (2016). *Assessing mathematics results of High School students*. Psychology Review, vol 7 (2016), pp. 16-26.

Research projects (03)

The PhD student has conducted 3 research projects at ministerial level

- Title of project: Autonomy and accountability of high-quality high schools in Vietnam today.
 Reference No: B2020-HVQ-09 Year of project implementation: 2020-2021 Role of PhD student: Leader of project
- Title of project: Teacher's STEAM capacities development at high schools; Reference No: B2018-HVQ-06 Year of project implementation: 2018-2019; Role of PhD student: Leader of project This project has been accomplished and approved
- Title of project: Proposed models of specialized classrooms at high schools to meet the requirements of the new curriculum; Reference No: B2018-HVQ-07. Year of project implementation: 2018-2019; Role of PhD student: Member of project This project has been accomplished and approved

INTRODUCTION

Assessment is an integral part of teaching process. It can be said that evaluation is the driving force to promote innovation in teaching and learning. Many new and old forms of assessment coexist. Several new evaluation approaches and new concepts have emerged.

Regarding the current situation of student assessment in high schools, it is obvious that we have not correctly and clearly identified the philosophy of assessment: what to do, why to evaluate, what competencies to develop among students? ... Currently, we are mainly focusing on assessing students' academic performance to grade them and give scores but we do not give feedback.

There have been many works focusing on assessment questions. With the available resources, we just presented some specific researches related to our study.

In general, we find that most of studies have presented the current status of assessment in high schools and pointed out some limitations in assessment. However, in order to innovate the assessment method, more in-depth studies need to be conducted.

In high school, math teachers' qualifications and abilities have a huge impact on students. Prioritizing the training of good teachers in the future will contribute to improving the quality of human resources and enhancing the social development. The existing research results on assessment competency are still not enough to satisfy the demands of society and the requirements of fluctuation in general curriculum. Therefore, the development of teaching competency in general and assessment competency in particular for students needs innovation.

From the above reasons, we choose the research about "Developing pupils' assessment competencies for students specialized in mathematics education".

1. Research objectives

The study aims to develop pupils' assessment competencies among students specialized in mathematics education.

2. Object and subject of study

- *Subject of study:* Training process of mathematics students at University of Education.

- *Object of study:* The process of fostering the competency of assessing high school students' mathematics results for students specialized in mathematics education of universities according to the orientation of assessing learners competencies.

3. Scientific hypothesis

If the basic elements in assessing high school students' academic performance are identified and appropriate measures are proposed, they will contribute to the development of students' assessment competency, thereby improving the quality of mathematics teachers in high schools.

4. Research missions

4.1. Theoretical research

- Math achievement assessment of high school students according to the orientation of assessing the learner's competency.

- Teaching competency, competency to conduct tests and assessments in teaching in general and teaching Mathematics in high schools in particular.

4.2. Practical research

- Assessment of teachers competencies in evaluating mathematics results of high school students.

- Current situation of training assessment competencies for students at pedagogical universities.

4.3. Aims

- Determine what competencies teachers need to achieve in order to assess pupils' mathematics achievements.

- Determine what measures to enhance students' assessment competencies of mathematics results according to the orientation of assessing the learner's competency.

4.4. Empirical research

We organize empirical research in breadth and depth to test the feasibility and effectiveness of the proposed measures.

5. Research scope

The thesis focused on the research and finding of pedagogical methods to form and enhance pupils' mathematics results assessment for students according to the orientation of assessing the learner's competency.

6. Research methodology

6.1. Theoretical research method

- Methods of observation and investigation

- Empirical pedagogy
- Case study

7. Scientific arguments

- Teacher competency framework for assessing math learning results of high school students

- Pedagogical methods to develop assessment competency of students specialized in mathematics education.

8. Thesis's findings

Theoretical contributions

- Teacher competency framework for assessing math learning results of high school students

- Pedagogical methods to develop assessment competency of students specialized in mathematics education.

Practical contributions

- Evaluate the current status of competencies' component, the competency to evaluate Maths learning results of high school teachers and the current situation in pedagogical universities.

- The findings can be used in teaching at universities with math pedagogy training.

CHAPTER 1. THEORETICAL FRAMEWORK

1.1. Literature review

1.2. Notions of assessment

1.2.1. Measuring

From the points presented, the author thinks that measurement is related to the use of numbers in the quantification of events, phenomena or attributes.

1.2.2. Testing

The author indicates that the test is a type of measurement, which uses a number of systematic methods to gather information and convert it into scores to quantify what needs to be measured.

1.2.3. Examination

The author thinks that despite different point of views, in general, examination is the process of reviewing, organizing the information collection and it is associated with measurement activities to produce results, compare achievements with initial requirements, set goals or standards to determine what has been achieved, what has not been achieved, the causes and influencing factors.

1.2.4. Assessing

1.2.5. Academic achievement and assessment

It can be understood that the assessment of academic achievement is a comparison of knowledge, skills and attitudes achieved by learners with the expected results identified in the learning objectives in order to make appropriate conclusions. The assessment must bring out reliable conclusions about the student's academic performances, help teachers make appropriate decisions during their teaching process and promote learning motivation and enhance student responsibility for learning. To achieve this, the assessment must be able to perform its functions. It must base on evidence gathered from different activities. The methods used in the assessment of academic achievement need to be diverse and appropriate to learning objectives, follow certain principles and must be an integral part of the teaching and education process.

1.3. Competency notion

1.3.1. Competency

Through some publications of domestic and foreign researchers, the author states that teacher competency is a complex psychological attribute including many factors such as knowledge, skills, techniques, expertise, attitude, experience, and the willingness to act responsibly and effectively in flexible situations.

1.3.2. Teacher competencies

1.4. Current trends in educational assessment

- 1.4.1. Forms of educational assessment
- 1.4.2. Objectives of assessment
- 1.4.2.1. Assessment of Learning
- 1.4.2.2. Assessment for Learning
- 1.4.2.3. Assessment as Learning

1.5. Classification of assessment

1.5.1. Classification by assessment objectives

- Placement assessment
- Dignostic assessment
- Change Assessment

1.5.2. Classification by moment

- Formative assessment
- Summative assessment

1.5.3. Classification by reference

- Norm referenced assessment
- Criterion referenced assessment

1.5.4. Classification by scale

- Large scale assessment
- School based assessment
- Classroom assessment

1.5.5. Classification by participants

- Self assessment
- Peer assessment
- Group assessment
- Individual assessment

1.5.6. Classification by type of assessment

- Paper Testing
- Authentic assessment

1.6. Teacher competency in assessing math results of high school students

1.6.1. Teacher's diagnostic competency in terms of ability and math performance of students

1.6.2. Competence to implement strategies and assessment methods suitable for Mathematics teaching objectives

- Assessment competency by testing

- Assessment competency in classroom

- Competency to organize real assessment

- Competency to guide self-assessment's students

1.6.3. Competency to use teaching facilities

1.6.4. Competency to perform the assessment process

- Assessment planning competency
- Assessment tools design competency
- Competency to score students
- Competency to apply assessment results

Teacher competency in term of students' math performance assessment

T1 (Teacher's diagnostic competency in terms of ability and math performance of students):

Competency to apprehend students'academic records, organize interviews; design tests

T2 (Competence to implement strategies and assessment methods suitable for Mathematics teaching objectives):

Understanding of assessment strategy; Understanding of assessment methods; Competence to guide students's self-assessment T3 (*Competence to perform the assessment process*):

Assessment planning competency; Assessment tools design competency; Competency to use teaching facilities; Competency to score students; Competency to use assessment results to adjust teaching and learning; Competency to find out the progress and barriers in learning; Competency to apply assessment results to organizations and managers.

Conclusion

In chapter 1, the author has studied and clarified the following main questions: Viewpoints related to assessment; concepts related to teachers competencies; research on assessment trends in education; assessment classification At the end of Chapter 1, the author presented the teachers competencies in assessing academic achievements of high school students. He based on the general curriculum (in Mathematics) issued by the Ministry of Education and Training in 2018, the professional standards for high school teachers and other domestic and international studies. He analyzed some of the core factors of student's academic achievement assessment competency including the teacher's diagnostic competency in terms of ability and math performance of students, competence to implement strategies and assessment methods suitable for Mathematics teaching objectives, competence to use teaching facilities and competence to perform the assessment process.

Based on the analysis and description of teacher competencies in Chapter 1, he will conduct surveys to assess the current status of this competency among Math teachers in high schools in Chapter 2.

The studies analyzed in Chapter 1 are an important initial basis for the author to conduct further research on the teacher competency framework in evaluating Mathematics results of high school students in Chapter 3.

CHAPTER 2. CURRENT SITUATION

1.1. Research methodology

1.1.1. Research objectives

This study aims to:

- Evaluate the current status of teachers competencies in evaluating Maths results of high school students;

- Find out the current status of assessment competencies training for math pedagogy students in universities.

2.1.2. Sample size

The survey was conducted among a sample of 16 educational experts actively participating in educational research, 15 lecturers teaching Mathematics at universities; 68 Mathematics teachers at 6 high schools (including 6 teachers selected by the author as team leaders at each high school they are teaching for to facilitate his

research process. They are respectively Mr. Le Hong Quang (Xuan Giang High School, Hanoi), Mr. Nguyen Van Trung (Nguyen Hoang High School, Thanh Hoa), Mr. Do Le Son (Chu Van An High School, Hanoi), Mr. Nguyen Van Thuat (Le Quy Don High School, Hanoi), Mr. Van Duc Chin (Ha Long specialized High School), Mr. Dam Van Nhi (specialized High School of Hanoi National University of Education). Another sample is composed of 68 students at Hong Duc University for case study. The author uses two main survey tools which are questionnaires and interviews. In this study, he uses a vertical and transversal survey with data collected from 2016 to April 2019. Besides, he also uses camera and recording techniques to save information for his research.

1.1.2. Data collection methods

The research tools used in this study are questionnaires and descriptions of teachers competencies in assessing Mathematics achievements of high school students (this description is presented in Chapter 1):

+ Educational experts (appendix 1), lecturers (appendix 2), students (appendix 3), secondary school teachers (appendix 4), high school students (appendix 5).

+ The competency of teachers to evaluate academic achievements of high school students (in Chapter 1).

Data processing tools are algorithms of mathematical statistics to calculate the weighted average of \overline{X} for a criterion according to the following formula:

$$\overline{X_j} = \frac{\sum_{i=1}^n f_i x_i}{\sum_{i=1}^n f_i}.$$

In which: j is the order of criteria (activities to be assessed); $\overline{X_j}$ is the weighted average for the criterion j to be assessed; $x_1, x_2, ..., x_n$ are the levels to be evaluated against a criterion to be assessed (with n levels to be evaluated); $f_1, f_2, ..., f_n$ are the number of answers to each level of each criterion to be assessed ($x_1, x_2, ..., x_n$).

Survey data are processed according to the average value and classified by the rating scale as follows: 1.00 - 1.75: Very poor; 1.76 - 2.50: Fair; 2.51 - 3.25: Good; 3.26 - 4.00: Excellent

2.1.4. Data collection

This study aims to properly assess the current status of teacher competencies in assessing the academic achievements of high school students and assessment competencies training for students math specialized in math pedagogy at universities. The research is conducted through the following steps:

- Step 1: Set up a research team

- Step 2: Study researches related to the educational assessment, the competency of teachers in evaluating Maths performance of high school students.

- Step 3: Apply the teacher competency framework described in Chapter 1 to conduct the empirical pedagogy

- Step 4: Consult the answers given by external educational experts and teachers

- Step 5: Evaluate the teacher's competency in assessing high school students' Maths achievements.

- Step 6: Research on the current status of assessment competencies training for students specialized in math pedagogy at universities.

2.1.5. Data analysis

The author and members conducted interviews with 16 educational experts, 15 lecturers, 68 teachers and 68 students. During his research process, he used digital devices to record images and voices. He analyzed answers given by educational experts and teachers through inductive classification. A list of questionnaires is distributed to each interviewee in each group of respondents.

Data collection and processing is made by synthesizing the collected data and summarizing answers given by 16 educational experts.

For each questionnaire, the author arranged answers according to the rating scale: Good (4 points), Fair (3 points), Average (2 points) and Weak (1 point). Then, he calculated the weighted average by algorithm.

2.2. Current status of teacher competencies in assessing Maths results of high school students

2.2.1. Current status of teacher's diagnostic competency in terms of ability and math performance of students

2.2.2. Current status of teacher competence to implement strategies and assessment methods suitable for Mathematics teaching objectives

2.2.3.Current status of teacher competence to perform the assessment process

2.2.4. General observations

Through consulting documents on teacher competencies on assessing students' math results and answers given in questionnaires and interviews, it is obvious that:

- The majority of teachers are aware that it is necessary to improve teacher competency in assessing students' math result in particular and overall academic achievements in high schools in general. However, in fact, this requirement is not well satisfied yet because most teachers do not properly understand about academic achievements assessment and the need to foster this competency. Generally, they do not have assessment skills or their skills are not good enough, the method of assessing learning results in many high schools has not yet been renovated. They have not considered the assessment of students' learning results as one of the bases for students assessment to help them become self-aware, active and motivated in learning.

- Based on the assessment of actual situation, the author finds that it is necessary to foster some competency components that currently teachers have not met the standards covered in the teacher competency framework such as:

+ The teacher competency to guide students to make self-assessment

+ The scoring competency

+ The competency to design learning tasks as a pedagogical method to develop teacher competence in educational assessment.

2.3. Current status of pupils performance assessment competency training for students specialized in math pedagogy

2.3.1. Student perceptions of the importance of Mathematics results assessment

2.3.2. Current situation of teaching - learning methods in universities with mathematics pedagogy

2.3.3. Current status of assessment competency training for math pedagogy students in some vietnamese universities

Through the above study, it can be seen that students are no well skilled for pupils math performance assessment. Due to the lack of time in teaching, the training of academic performance assessment skills is limited.

+ By considering educational assessment of students as a process consisting of diverse stages such as preparation; information collection; information processing; feedback, it is necessary to provide knowledge and skills to give feedback for students.

+ During the process of teaching students about assessment methods, teachers only focus on multiple-choice methods but do not really pay adequate attention to methods of observation, self-assessment and assessment through pupils records. Meanwhile, observation is one of the most popular method used to collect information in the assessment process while self-assessment is indispensable in the learning process.

The training of professional competencies for students has received attention from universities, especially in training pedagogical competencies. However, universities and students only focus on practicing black boards writing skills, lesson plans, presentation, etc and pupil academic performance assessment competence is not really prioritized.

Conclusion

In the chapter 2, the author has analyzed the current situation of teacher competence in educational assessment of high school students in math learning, the perception of students about the importance of educational assessment, the training capacities of universities having math pedagogy.

It is noticeable that this situation is due to the fact that educators in universities have not properly evaluated the role of assessment in the teaching process. Lecturers are not well skilled to provide knowledge and train this competency for students.

CHAPTER 3. PROPOSITIONS

3.1. Teacher competency framework in math results assessment of high school students

In order to perfect the teacher competency framework in math results assessment of high school students, the author based on previous related studies, the analysis results from interviews with educational experts and questionnaires.

As a result, a teacher competency framework includes the following elements:

1. The teacher's diagnostic competency in terms of ability and math performance of students

2. Competence to implement strategies and assessment methods suitable for Mathematics teaching objectives

3. Competency to use teaching facilities

4. Competency to perform the assessment process Here are the research results:

Table 3.1. Teacher competency framework in math results assessment of high school students

Competencies	Descriptions										
T1. Teacher's diagr	ostic competency in terms of ability and math										
performance of students											
T1.1. Competency	T1.1.1. Diagnosing students' math skills										
to apprehend	through academic records, exchange and										
students'academic	interview with students. Detecting strengths										
records, organize	and barriers to math learning of students.										
interviews											

Competencies	Descriptions								
T1.2. Competence	T1.2.1. Building exam system in the form of								
to build diagnostic	multiple choice questions and essays to ensure								
test	that it is suitable to the curriculum and the level								
	of students.								
	T1.2.2. Developing an exam system that								
	assesses many aspects of students: creative								
	capacity, critical thinking, mathematical								
	language ability, life experience, mathematical								
	knowledge, competency to apply mathematical								
	knowledge and individual experiences of								
	students themselves in solving life problems.								
T2. Competence to	implement strategies and assessment methods								
suitable for Mathema	atics teaching objectives								
T2.1.	T2.1.1. Understanding different forms of								
Understanding of	educational assessments.								
assessment	T2.1.2. Understanding the philosophy of								
strategy	educational assessments.								
T2.2.	T2.2.1. Understanding of the organization and								
Understanding of	implementation process of assessment.								
assessment	T2.2.2. Establising and implementing								
methods	assessments by test or essay.								
	T2.2.3. Applying well and regularly formal and								
	informal teaching methods for classroom								
	progress assessment; evaluating the learning								
	process and solving problems of students.								
T2.3. Assessment	T2.3.1. Establising a learning project associated								
competence	with real context to achieve the goal of teaching								
through learning	Mathematics.								
projects	T.2.3.2. Organizing learning projects and								
	evaluating the project's implementation and								
	products (real evaluation).								

Competencies	Descriptions							
T2.4. Competence	T2.4.1. Helping students evaluate their own							
to guide students's	progress through their learning process and							
self-assessment	their academic performance.							
	T2.4.2. Helping students assess their peers'							
	progress on the basis of their goals, their							
	learning process and their level of achievement.							
T4. Competence to	perform the assessment process							
T4.1. Assessment	T4.1.1. Clearly defining objectives of							
planning	assessment.							
competency	T4.1.2. Determining the subjects and objects to							
	be assessed							
	T4.1.3. Establising a clear and detailed plan of							
	assessment.							
T4.2. Assessment	T4.2.1. Understanding formal and informal							
tools design	assessment tools in education.							
competency	T4.2.2. Using teaching facilities to support the							
	design of assessment tools.							
	T4.2.3. Getting feedback on the effectiveness							
	of assessment tools and adjust them to satisfy							
	requirements.							
T4.3. Competency	T4.3.1. Having good competence in holistic							
to score students	scoring and analytical scoring. For grading							
	essays, teachers always have comments and							
	encouragement to motivate their students.							
	T4.3.2. Scoring is given during the student's							
	implementation of learning projects and their							
	products.							
	T4.3.3. In scoring, teachers are always attentive							
	to students' attitudes, interests, motivation and							
	skills.							
	T4.3.4. Synthesizing the component scores							
	related to student academic achievements.							
	T4.3.5. Summarizing students' overall and							
	detailed academic performances.							

Competencies	Descriptions								
T.5.1 Competency	T5.1.1. Promptly adjusting pedagogical								
to use assessment	methods and teaching content.								
results to adjust	T5.1.2. Teachers help students adjust their								
teaching and	learning methods, motivate them to make								
learning	efforts and actively study.								
T5.2. Competency	T5.2.1. Finding out the causes of student's								
to find out the	progress and barriers.								
progress and	T5.2.2. Discussing with student's parents or								
barriers in learning	tutors to understand the barriers they are facing								
	in their studies and their lives.								
T5.3. Competency	T5.3.1. Helping educational administrators								
to apply	adjust curriculum, orient future educational								
assessment results	goals.								
to organizations	T5.3.2. Supporting educational and vocational								
and managers.	training organizations.								

3.2. Measures to develop students' competencies for assessing math results of high school students

3.2.1. General principles

3.2.2. The first measure. Studying academic records and building interviews as a tool to help students diagnose pupil results and Math learning ability

This measure aims to familiarize students with academic records and interviews so that they can give comments and observations about pupil learning abilities at present and in the future.

3.2.3. The second measure. Designing learning projects to help pupils learn how to solve real problems from that it can improve students' real assessment competencies

This solution aims to improve student's assessment competence through learning projects and problem - solving in realworld contexts; In addition, it enhances the students' competency for self-assessment.

3.2.4. The third measure: Fostering students' scoring competency

It aims to raise students' awareness of the role of scoring so that they learn how to score through various formats.

3.2.5. The fourth measure: Designing learning tasks with increasing complexity level for students to practice problem - solving skills, thereby developing their assessment competency.

Designing learning tasks by increasing complexity level as a teaching method is the design of activities for students by gradually increasing the complexity of the task in order to consolidate their knowledge, form their skills and their assessment competency.

Conclusion

In Chapter 3, the author analyzed 2 major questions and proposed four measures.

The first question: Teacher competency framework in math results assessment of high school students

Based on studies about teacher competency framework and the current situation of pupils performance assessment competency training for students specilized in math pedagogy at universities, the researcher proposed four measures.

The second question: Four measures are proposed to develop student's competencies in educational assessment of pupils in order to enhance training quality of pedagogical universities.

According to the author, if the above measures are properly applied, they will promote the improvement of students' competencies in assessing Mathematics learning results of high school students in particular and improve the math teaching competency in general.

CHAPTER 4. EMPIRICAL RESEARCH ANALYSIS

1.1. Empirical research to evaluate the necessity and feasibility of the proposed competency framework

1.1.1. Methodology

4.1.2. Empirical research results

4.1.2.1. Student's diagnostic competency in terms of ability and math performance of pupils

4.1.2.2. Competence to implement strategies and assessment methods suitable for Mathematics teaching objectives

4.1.2.3. Competency to use teaching facilities

4.1.2.4. Competence to perform the assessment process

4.2. Empirical research to evaluate the necessity and feasibility of the proposed measures

4.2.1. Methodology

Research objectives

The purpose of empirical research is to collect information about the necessity and feasibility of proposed measures to correct the inappropriate measures and confirm the reliability of proposed measures.

• Empirical research questions

The empirical research is composed of the following questions:

+ Are proposed measures really necessary for the development of students' competencies in assessing Mathematics achievements of pupils?

+ Are proposed measures really applicable to develop students' assessment competency?

• Empirical research method

The author designed a questionnaire with 4 rating scale: 1-Very necessary; 2-Necessary; 3-Neutral; 4-Not necessary.

Survey respondents

Totally, there are 68 respondents (including 16 educational experts and lecturers and 52 math teachers at high schools). Specifically, these educational experts are working for institutes and universities such as: Hanoi National University of Education, VNU University of Education, Thai Nguyen University, Hong Duc University, National Institute of Education Management. 52 math teachers are working for Nguyen Hoang High School, Chu Van An High School (Hanoi), Dong Son 2 High School (Thanh Hoa province), Le Hong Phong High School (Dong Nai province), Ha Long specialized High School (Hai Phong province).

4.2.2. Empirical research results

4.3. Testing the measure "Fostering students' scoring ability" Table 4.10. Information of respondents students

No	Class	Student's full name	Notes				
	K18A		She is taught				
1	Hanoi National	Nauvon Thi Lon Anh	about the proposed				
	University of Education,	Nguyen Tin Lan Ann	measures				
	major: Mathematics						
	K18A Hanoi National		She is taught				
2	University of Education,	Nguyen Thi Thuy Ha	about the proposed				
	major: Mathematics		measures				
3			She is taught				
	K18A ÐHSP Toán	Trinh Quoc Tuan	about the proposed				
			measures				
	K18B Hanoi National		She is not taught				
4	University of Education,	Nguyen Van Nam	about the proposed				
	major: Mathematics		measures				
	K18B Hanoi National		She is not taught				
5	University of Education,	Bui Thi Phương	about the proposed				
	major: Mathematics		measures				
6	K18B Hanoi National		She is not taught				
	University of Education,	Duong Van Thang	about the proposed				
	major: Mathematics		measures				

The author has received the help of lecturers to contact these 6 students (these students are internship process, of which 03 students have been taught about the author's pedagogical measures proposed in the thesis, and 03 others were not affected by these measures). He contacted them by phone and email and explained the role of this survey and expressed his wish for students to demonstrate their ability in assessing math learning results through designing a Rubric evaluation. All of them agreed to apply his proposed methods.

Task implementation time: 05 days.

After the time is up, the author collects these Rubrics. As a result, only four students completed the Rubric; the remaining two

students could not design a Rubric yet as they did not properly understand how to design a Rubric.

Result evaluation:

After receiving 04 Rubrics of 06 students, the results showed that:

- 03 students affected by the method proposed by the author could finally design their Rubrics to evaluate pupils' Maths learning results.

- Among 03 other students which were not taught about author's methods, 2 of them could not finish Rubric design. Only one of them accomplish a Rubric product. However, the interpretation of contents and description of his Rubric is difficult to understand and inapplicable for assessment.

It can be said that for students who are not taught about the pedagogy proposed by the author, the scoring competence through Rubric design is low while the students who are taught about the author's method has demonstrated their good competencies through Rubric product design. Therefore, the author hopes that the measures proposed in this thesis will be applied to the training of future Mathematics teachers. He believes that their competency will be enhanced in the future. This will positively impact student progress.

Conclusion

In Chapter 4, the author has tested the necessity and feasibility of the proposed competency framework and proposed four measures.

He analyzed 2 major questions:

Question 1: Overall evaluation of educational experts, lecturers and teachers on the teacher competency framework in pupil's Maths performance assessment was analyzed. The author received a high consensus about this framework.

Question 2. The author tested his proposed measure through 06 fourth-year students specilized in math education and they were randomly selected from two classes. The results show that the assessment competence among students which have not been affected by author's method is low. On the contrary, the students influenced by his proposed pedagogy obtained good results, as shown by their Rubric product.

GENERAL CONCLUSION

This study achieved the following results:

1. The thesis has contributed to clarify the basic questions of assessment, educational assessment.

2. It has clarified concepts related to the educational assessment and teacher competence in educational assessment.

3. It has proposed the teacher competency framework in assessing Mathematics learning results of pupils which is respectively:

-The teacher's diagnostic competency in terms of ability and math performance of students

- Competence to implement strategies and assessment methods suitable for Mathematics teaching objectives):

- Competency to use teaching facilities

- Competency to perform the assessment process

4. The researcher has proposed 4 pedagogical measures to develop students in math pedagogy in educational assessment.

- The first measure is studying academic records and building interviews as a tool to help students diagnose pupils results and Math learning ability

- The second measure includes of designing learning projects to help pupils learn how to solve real problems from that it can improve students' real assessment competencies

- The third measure is fostering students' scoring competency

- The last one is designing learning tasks with increasing complexity level for students to practice problem - solving skills, thereby developing their assessment competency.

5. The author has conducted an empirical research to test the pedagogical results. The result has shown the feasibility of these proposed measures.