

MINISTRY OF EDUCATION AND TRAINING
HANOI PEDAGOGICAL UNIVERSITY 2

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**TRAINING MATHS TEACHING SKILLS FOR PRIMARY
EDUCATION STUDENTS UNDER COLLABORATIVE
LEARNING APPROACH**

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LIST OF WORKS PUBLISHED OF THE AUTHOR RELATING TO
THE THESIS TITLE

- 1) Tran Xuan Bo (2013), “Training some specialized teaching skills for primary teachers”, *Education Journal*, vol. August, 2013, pp. 65-66.
- 2) Tran Xuan Bo and Chu Vinh Quyen (2014), “The required skills of a math teacher in maths teaching”, *Science Journal*, Hanoi Pedagogical University 2, vol. 31, June, 2014
- 3) Nguyen Cao Thanh, Nguyen Ba Duc, Nguyen Khai Hoan, Tran Xuan Bo (2015). Cross-Learning Experiences of Vietnamese Students at Australian Universities. *International Journal of Modern Education Research*. Vol. 2, No. Jan/2015, pp. 1-7.
- 4) Tran Xuan Bo (2015), “The current state of maths teaching skills of teachers in primary schools in Tuyen Quang province”, *Education Journal*, vol. 362(2) July, 2015, pp. 37-38 and pp. 29).
- 5) Tran Xuan Bo (2015), “Practising the skills of selecting and designing additional exercise systems in primary maths instruction”, *Yearbook of Pedagogical University - Da Nang University*, October, 2015, pp. 748-758.
- 6) Tran Xuan Bo (2016), “Practicing the skills of detecting and solving some pedagogical situations in math teaching at primary schools”, *Journal of Educational Science*, January, 2016, pp. 51-54.
- 7) Tran Xuan Bo (2016), “Current status of teaching co-operative teaching of primary teachers in Tuyen Quang province”, *Journal of Educational Science*, July, 2016, pp. 85-88.
- 8) Tran Xuan Bo (2017), “The process of developing maths teaching skills for students of primary education at Tan Trao University”, *Journal of Educational Equipment*, July, 2017, pp. 16-19.
- 9) Tran Xuan Bo (2017), “Designing the activities of practising skills of teaching ual and mathematical concepts and properties for students of education at Tan Trao University”, *Yearbook of Thai Nguyen University- Lao Cai College*, November, 2017, pp. 281-287.
- 10) Tran Xuan Bo (2018), “Some measures of training mathematical skills for students of primary education according to approach of mathematical geometry at Tan Trao University”, *Education Journal*, vol. Jan/2018, pp. 40-43.

INTRODUCTION

1. Reasons for choosing the topic

(i). The need and the orientation to comprehensively renovate education and training

In Vietnam, developing human resource to achieve the goal of industrialization, modernization and further education is particularly interested by the Party and State. It has been concretized in the Education Law, Resolution No. 29-NQ/TW, Central Conference 8 Session XI. Therefore, teaching method in universities needs to have positive changes in many aspects, in which special attention should be paid to the professional capacity of students.

(ii). The requirement of training primary school teachers in pedagogical institutions

The renovation of the General Education Program in general and the implementation of the 2018 primary program in particular, have set an important task for teacher training institutions, which is to train and foster students to become teachers who have political and ethical qualities, educational and teaching capacities and other pedagogical capacities necessary to perform well in teaching (especially teaching in primary schools).

Teaching skills in general and Maths teaching skills in primary education in particular are the pedagogical skills necessary to be provided for students in primary education so that they can teach primary Maths after graduation. This is the core factor in the professional capacity of teachers, and they need to be invested in and trained for students.

(iii). The advantages of collaborative learning

Collaborative learning is one of the active learning activities following the non-traditional trend and is one of the important approaches in innovating teaching activities in Viet Nam. Training Maths teaching skills for students in Primary Education under the approach of collaborative learning aims at the objective that students can develop their Maths teaching skills through training, thereby forming and developing professional capacity so that they can meet the requirements of the educational career in modern times after graduation.

Thus, the issue of training Maths teaching skills for students of Primary Education under collaborative learning approach is the training of pedagogical skills that are necessary for students in Primary Education so that they can teach primary Maths after graduation. This is an issue of urgency to meet the educational goals of pedagogical institutions. However, the training of Maths teaching skills for students of Primary Education under collaborative learning approach has not been systematically mentioned.

2. Research purposes

On the basis of theoretical research on Maths teaching skills and collaborative learning, and the results of studying and analyzing the current situation of Maths teaching skills of students in Primary Education, we aimed at proposing a number of viable measures to train Maths teaching skills for students of Primary Education in Tan Trao University, Tuyen Quang province, under the collaborative learning approach.

3. Subjects and Objects of the research

3.1. Research subject

The process of training Maths teaching skills for students of Primary Education.

3.2. Research objects

Measures to train Maths teaching skills for students of Primary Education under the collaborative learning approach in the training process in Tan Trao University, Tuyen Quang province.

4. Research missions

(1) Research on the theoretical basis of training Maths teaching skills for students in Primary Education under the collaborative learning approach. (2) Survey the current situation of the teaching skills in general and that of Maths teaching skills of students in particular for Primary Education students and the reality of training Maths teaching skills for students in Primary Education at Tan Trao University, Tuyen Quang province. (3) Develop measures to train Maths teaching skills under the collaborative learning approach for students in Primary Education. (4) Conduct pedagogical experiment to test the feasibility and effectiveness of the proposed measures.

5. Research scope

5.1. Research area: Organizing survey, investigation, pedagogical experiment at Tan Trao University, Tuyen Quang province.

5.2. Research content: (1) Skills to design Maths lessons in primary schools; (2) Teaching skills of each typical situation in teaching Maths in primary schools; (3) Skills to deal with pedagogical situations while teaching Maths in primary schools.

6. Research method

6.1. Theoretical methods: Historical - logical analysis, theoretical generalization.

6.2. Practical methods: Observation, investigation by questionnaires, interviews with teachers and students of Primary Education; experience summaries by analyzing management records; pedagogical experiment.

6.3. Other methods: Specialist Method; Case study method; Processing data and evaluating the research results by mathematical statistics.

7. Scientific hypothesis

On the theoretical and practical basis, it is possible to build measures of training Maths teaching skills for students of Primary Education under the collaborative learning approach, and *if* these measures are applied appropriately in the training process of Primary school teachers, it *will* contribute to improve the quality of training Maths teaching skills for students in Primary Education.

8. Contributions of the thesis

- Clarifying the rationale for training Maths teaching skills for students in Primary Education under the collaborative learning approach.

- Analyzing and evaluating the current situation of training Maths teaching skills for students in Primary Education in general and training those skills for students of Primary Education under the collaborative learning approach in particular in universities in the current period.

- Developing content and proposing measures of training: Skills to design Math lessons in primary schools, teaching skills of each typical situation while teaching Maths in primary schools and skills to deal with pedagogical situations while teaching Maths in primary schools for students of Primary Education under the collaborative learning approach.

9. Arguments that need to be defended

- In terms of theory: The training of Maths teaching skills for students in Primary Education under the collaborative learning approach will both achieve the goal of training a number of Maths teaching skills in primary schools for students and create a premise for them to apply the collaborative learning approach in teaching at primary schools and professional self-training.

- In practical terms: The contents and measures to train Maths teaching skills for students in Primary Education under the collaborative learning approach proposed by the thesis have a scientific basis both in terms of theory and practice, not only feasible but also able to contribute to improving the quality of training Maths teaching skills for students in Primary Education.

10. Thesis structure

In addition to the Introduction, Conclusion, Recommendations, References and Appendices, the thesis has 4 chapters.

CHAPTER 1

THEORETICAL BACKGROUND OF TRAINING

MATHS TEACHING SKILLS FOR STUDENTS IN PRIMARY

EDUCATION UNDER COLLABORATIVE LEARNING APPROACH

1.1.Literature review

1.1.1. Research on skills

Having reviewed foreign research documents on skills, we see that the main research trends on this issue are:

(1). From a psychological perspective:

- Skills are considered the technique of manipulation, action and activity. Authors who support this statement include V.A. Cruchetski, A.G. Covaliop, V.S. Kudin. They claimed that skills are the method of performing the action that has been perceived by human. If one grasps method of action, one has the skills.

- Skills are not only a technique of manipulation but also an expression of the capacity. Authors supporting this viewpoint include N.D. Levitov, K.K. Platonop and G.G. Golubev.

(2). From a practical perspective:

The authors V.A.Cruchetski and A.G. Covaliop believe that skills are technical actions.

The study of skill training process is also interested by many researchers such as P.L. Galperin et al; N.L. Bondyrev, X.I. Kixegof, F.N. Gonobolin, etc.

In Vietnam: The abovementioned opinion that skills are technical actions is shared by several Vietnamese researchers such as Dang Thanh Hung, Tran Trong Thuy, and Nguyen Thanh Kinh.

From our point of view, skills can be considered the technique of certain manipulations or actions; Skills are formed on the basis of forming mechanisms of skills - action mechanism; Effective action skills are shown through the initiative, creativity and flexibility in applying skills. This affirms that skills are a factor of "purpose" and "creativity".

1.1.2. Research on collaborative learning

Collaborative learning (CL) has been researched and applied to teaching in the UK and USA. In Vietnam, there are a number of research projects on CL and they have achieved certain results. Through an overview of CL, we have several comments as follows: in terms of form, although they are called differently, the contents of the concept of CL in teaching are quite unified in that learners can help each other in learning for the common purpose -acquiring knowledge and practicing skills.

1.1.3. Research on teaching skills and training teaching skills

In the direction of basic research on teaching theories, the authors Pham Tat Dong and Dang Thanh Hung have researched and proposed measures to improve the quality of training and fostering teaching skills. The forging of teaching skills has been interested by many researchers.

On the basis of an overview of the researches on teaching skills, we found that: teaching skills include a combination of skills and are systematic; in the teaching process, the teaching skills include many stages; the basic way to form the teaching skills is practicing and experiencing; the training of teaching skills must comply with certain principles and ensure results.

1.2. Maths teaching skills in primary school

1.2.1. Skills

- The concept of skills: Skills are a form of practical action. They are the effective implementation of actions on the basis of applying rational and flexible

psychological properties, knowledge and experience to practical situations to achieve expected results.

- The relationship between skills and techniques is dialectical; in order to have perfect skills, it is necessary to have knowledge and techniques.

- Mechanism of skill formation: Stage 1: Recognizing purpose of action and action plan; Stage 2: Attempting; Stage 3: Practicing.

- The levels of skills: (L1) Imitating; (L2) Implementing; (L3) Precising; (L4) Transforming; (L5) Auto - adding techniques.

1.2.2. Teaching skills

Teaching skills are actions that creatively and flexibly apply the teachers' knowledge and techniques in organizing learning activities for students to achieve teaching goals.

1.2.3. Maths teaching skills in primary school

In primary school: The level of Primary Education students who are studying at pedagogical institutions are different from that of teachers who are teaching Maths in primary schools. Therefore, we temporarily divide the system of students in Primary Education into two large groups, a group to plan lessons and the other group to implement the lesson plan.

2.4. The formation of Maths teaching skills for students of Primary Education

1.2.4.1. Maths teaching skills of students in Primary Education

Maths teaching skills of students include: Knowing the purpose, meaning, requirements and content of the teaching skills; Performing the actions in the correct order instructed and organizing Maths teaching activities in Primary Schools with results; Actively practicing Maths teaching skills.

1.2.4.2. The formation of Maths teaching skills for students of Primary Education

The formation of Maths teaching skills for students of Primary Education needs to go through the following basic stages: (1) Theoretical learning in pedagogical institutions (2) Practicing and participating in field trips; (3) Practicing teaching pedagogical institutions; (4). Pedagogical practicing

1.2.4.3. Training Maths teaching skills for Primary Education students

The goal of training Maths teaching skills for students in two modules: Maths teaching method and Training professional skills in terms of knowledge and skills.

1.3. Collaborative learning approach

1.3.1. Collaborative learning

Collaborative learning is a way of learning in which students work together in small groups of many different students and groups are carefully built up. Students learn by doing, not just by listening.

1.3.2. The scientific base of collaborative learning

In teaching theory, some popular learning theories are learning theory in the context of cognitive philosophy; Pavlov's classical conditioning theory; behavioral theory; constructivism theory. It can be confirmed that these are the basic scientific bases of collaborative learning approach.

1.3.3. The process of collaborative learning

Assigning the learning group and arranging the location of each group in accordance with the design; assigning tasks to each group; guiding each group to complete their tasks; monitoring, controlling, instructing and supporting groups; students reporting results and teacher evaluating.

1.3.4. Principles of collaborative learning

Importance, Panorama, Suitability, Chain of Links, Influencer, Coordination, and Communication.

1.3.5. Training Maths teaching skills for students under collaborative learning approach

1.3.5.1. Collaborative learning approach

Approach is a term of how to approach to learn, research or solve a problem. Collaborative learning approach as a teaching method has been recognized by teaching theorists and is called collaborative teaching method. The approach of collaborative learning is the process of organizing and controlling the relationship between factors: the teacher, groups of students and knowledge (in which the interaction between students in each group is the center), making them move and develop in a certain order to perform teaching tasks.

1.3.5.2. Training Maths teaching skills under collaborative learning approach

On the basis of the abovementioned concepts, we believe that: Training Maths teaching skills for students in Primary Education under collaborative learning approach is the process of training Maths teaching skills in primary schools with scientific measures learn to organize and control interactive

relationships between students - students, students - teachers, students - open learning resources, mobilizing and developing in a certain order, and performing complex actions or activities of teaching Maths.

1.4. Conclusion

(1) The training of Maths teaching skills for students in universities is to help students know about Maths teaching skills in primary schools, practicing Maths teaching skills in primary schools, becoming more aware of practicing Math teaching skills in primary schools.

(2) Collaborative learning approach is the process of organizing and controlling the relationships between the interactive elements between students - students and to implement the lesson plans.

(3) Based on the basis of scientific research, it is possible to practice the teaching skills: skills to design Maths lessons in primary schools; teaching skills of each typical situation in teaching Maths in primary schools; skills to deal with pedagogical situations while teaching Maths in primary school under collaborative learning approach.

CHAPTER 2

PRACTICAL BASIS OF TRAINING MATHS TEACHING SKILLS FOR PRIMARY EDUCATION STUDENTS UNDER COLLABORATIVE LEARNING APPROACH

2.1. Survey purposes and respondents

2.1.1. Survey purposes

(1) Identifying the current situation of students in Primary Education; (2) Investigating the training of Maths teaching skills for students of Primary Education at Tan Trao University, Tuyen Quang province; (3) Finding out views and opinions about the training of Maths teaching skills for students in Primary Education under collaborative learning approach.

2.1.2. Survey respondents

(1) Students in Primary Education: 91 students, of which the majority are students from the 3rd year or above; (2) Teachers of the Department of Primary Education at Tan Trao University (12 teachers, most of whom have master's degrees or higher; they are responsible for 33 classes with over 1700 students) (3) 12 experts.

2.2. Survey contents

The awareness of Maths teaching skills and the real situation of those skills for students of Primary Education; The training of Maths teaching skills for students of Primary Education; The views and opinions about the training of Maths teaching skills for students in Primary Education under collaborative learning approach.

2.3. Survey methods and techniques

Questionnaire; Analyzing the modules of Maths teaching method, Analyzing programs of training regular pedagogical skills of Primary Education Faculty; Consulting experts.

2.4. Analyzing survey results

2.4.1. Reality of Math teaching skills for Primary Education students

2.4.1.1. Primary Education students' awareness about Maths teaching skills

The survey results show that many students are not properly aware of the important role of training activities of Maths teaching skills, so they do not have the right spirit and attitude in practicing these skills, which limits their implementation.

2.4.1.2. Reality of implementing Maths teaching skills for Primary Education students

The survey results show that most students in Primary Education are not proficient in implementing teaching skills such as: designing Maths lessons in primary schools; teaching typical situations while teaching Maths in primary schools; dealing with pedagogical situations while teaching Maths in primary schools

2.4.1.3. Reality of training Maths teaching skills for students of Primary Education

The survey results show that most of students have been aware of and fully implemented the teaching skills, expressed in the lesson plans and teaching activities. However, students still face many difficulties in implementing skills to build up lesson content, to choose teaching methods, to design teaching activities, and to design learning environment.

2.4.2. Reality of training Maths teaching skills for students of Primary Education

2.4.2.1. Content of the program of training Maths teaching skills for students in Primary Education

Looking at the content of the current program used at the institution surveyed, it can be seen that the training of specialized and professional knowledge still draws little attention. The contents of training Maths teaching skills and regular training of pedagogical skills in Maths have not been focused in depth. The results of training the Maths teaching skills depend a lot on teachers' teaching organization of the abovementioned contents.

2.4.2.2. The process of training Maths teaching skills for students of Primary Education

The survey results show that teachers mainly instruct students to study in traditional ways, so many students have not really been able to participate in modern learning activities.

2.4.2.3. Methods of training Maths teaching skills for students of Primary Education

Surveying the teachers who teach 2 subjects of Maths teaching and regular training of pedagogical skills on the use of teaching methods to train students in Primary Education, the teaching methods which are used by teachers include: presentations, group discussion, problem solving, explanation - illustration, practice.

2.4.3. Reality of training Maths teaching skills for students in Primary Education under the collaborative learning approach

2.4.3.1. Teachers' awareness of training Maths teaching skills for students of Primary Education under the collaborative learning approach

The survey results show that teachers possess quite good awareness of training Maths teaching skills for students under the collaborative learning approach. The evaluation of the effectiveness that the collaborative learning approach brings to training Maths teaching skills is that it has made positive impacts on the training process training for students.

2.4.3.2. The situation of training Maths teaching skills for students of Primary Education under the collaborative learning approach

The survey results of teachers using collaborative learning approach training Maths teaching skills for students in Tan Trao university show that the use of this approach is still very monotonous.

Surveying experts and lecturers about the level and effectiveness of training Maths teaching skills under the collaborative learning approach, and the feasibility of applying measures of training Maths teaching skills proposed by the thesis, it can be said that these are potential Maths teaching skills exploiting well the cooperation of students with other factors to form and develop Maths teaching skills which are very important for students in Primary Education.

2.4.3.3. Awareness of students in Primary Education on training Maths teaching skills under the collaborative learning approach

The reality of training Maths teaching skills for students of Primary Education and the reality of students' awareness about collaborative learning and training Maths teaching skills under the collaborative learning approach schools shows that most students think that the collaborative learning approach has a positive impact on the training of Maths teaching skills. In terms of the importance of training under the collaborative learning approach, most students show the need to practice Mathsteaching skills to improve their learning capacity under the collaborative learning approach. Regarding the organization of training Maths teaching skills under the collaborative learning approach, students' desire is that teachers organize this form of training so that students can develop their capacities.

2.5. Conclusion

Analysis of practical survey results has clearly shown that:

- (1) Several teaching skills of Primary Education students are still limited.
- (2) Time allowance for practicing specialized teaching skills in Maths is still small. Therefore, building and implementing a general process of training Maths teaching skills for students in Primary Education is an important and necessary requirement.
- (3) Most teachers and students have basic awareness of collaborating learning approach and the nature of this approach. Accordingly, teachers and students all think that CLA has many advantages in organizing training Maths teaching skills for students.

(4)The vast majority of teachers and students think that training teaching skills for students in Primary Education under the CLA is one of the appropriate directions for training Maths teaching skills for students in Primary Education. However, the training of Maths teaching skills under the CLA has not been focused and has not brought its effectiveness into pedagogical institutions.

CHAPTER 3

MEASURES OF TRAINING MATHS TEACHING SKILLS FOR STUDENTS OF PRIMARY EDUCATION

UNDER THE COLLABORATIVE LEARNING APPROACH

3.1. Principles of building measures to train Maths teaching skills for students of Primary Education under the collaborative learning approach

3.1.1. Ensuring purposefulness

The purpose of training Maths teaching skills for students of Primary Education under the collaborative learning approach is that students learn and practice Maths teaching skills to form a seriously organized and scientific process by themselves.

3.1.2. Ensuring systematic-ness

The implementation model of training Maths teaching for students in Primary Education is shown in figure 3.1.

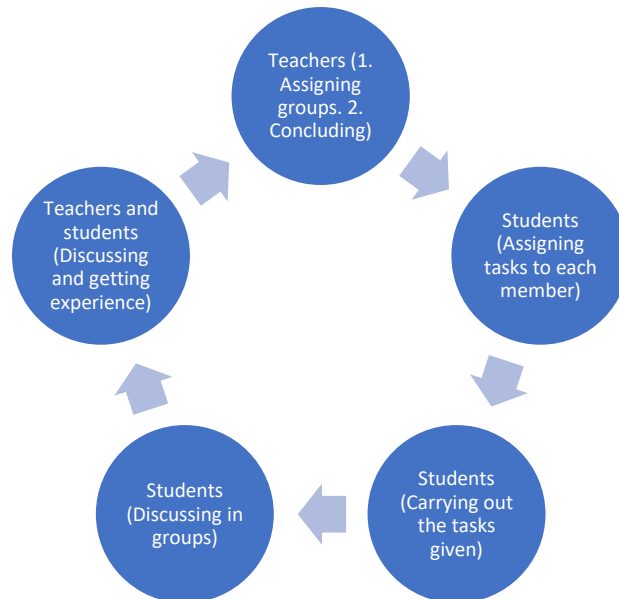


Figure 3.1. *The implementation model of training Maths teaching skills for students of Primary Education*

3.1.3. Ensuring practicality

Students' professional skills are not innate, they are the result of a process of learning and practicing Maths teaching skills from simple to complex stages in pedagogical institutions according to the curriculum.

3.1.4. Ensuring comprehensive efficiency

Measures to train Maths teaching skills for students in Primary Education must ensure wide application and effectiveness in training.

3.2. The foundations for building measures to train Maths teaching skills for Primary Education students under the collaborative learning approach

3.2.1. Based on the characteristics of collaborative learning approach

Characteristics of the CLA are shown in the following aspects: the learning tasks, the content, the process of organizing tasks, the method, the teaching organization, the evaluation.

3.2.2. Based on the output standards of students in Primary Education

The output standards of students in Primary Education, Tan Trao University are to form a general model of pedagogical action, creating the techniques of pedagogical skills. It is the application of those skills into the diversity of teaching activities that forms the pedagogical skills for students, one of which is Maths teaching skills.

3.2.3. Based on the professional requirements and learning performance characteristics of pedagogical students

Currently, to meet the professional requirements, pedagogical students need to not only grasp general knowledge, skills, techniques, and specialized knowledge but also need to be able to adapt.

3.3. Measures to train Maths teaching skills for Primary Education students under the collaborative learning approach

3.3.1. Measure 1: Develop a general procedure of training Maths teaching skills for students of Primary Education under the collaborative learning approach

3.3.1.1. Scientific basis and the purpose of the measure

- The measure is built on the following scientific basis: Psychology, Pedagogics; Practical basis.

- The purpose of the measure: to propose a reasonable procedure to train Maths teaching skills for Primary Education students under the collaborative learning approach.

3.3.1.2. Content of the measure

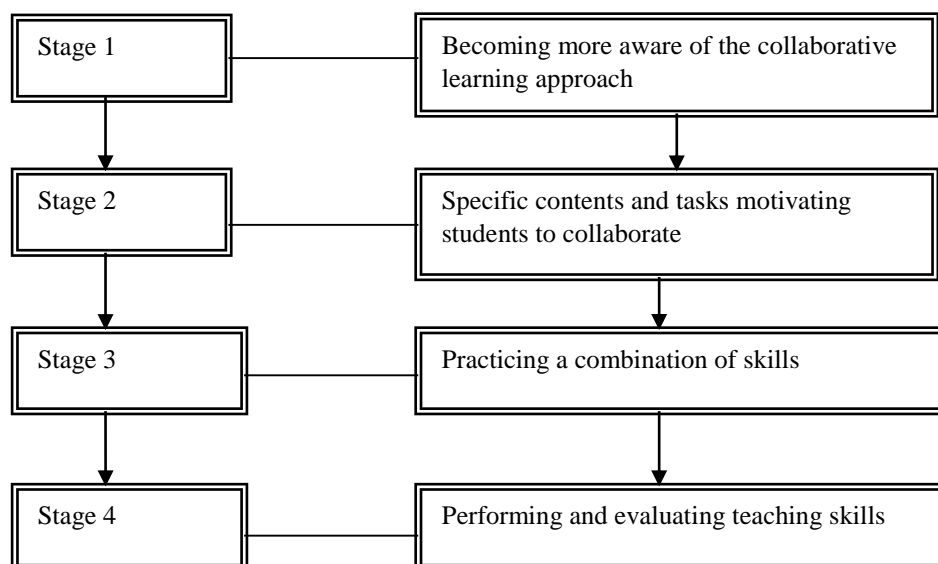


Figure 3.2. *The stages of training Maths teaching skills under the collaborative learning approach*

3.3.2. Measure 2: Training the skill of designing Maths lesson plans under the collaborative learning approach

3.3.2.1. Scientific basis and the purpose of the measure

- The measure is built on the following scientific basis: Psychology, Pedagogics; Practical basis.

- The purpose of the measure: to train the skill of designing Maths lesson plans under the collaborative learning approach

3.3.2.2. Content of the measure

(a) Training the skill of designing Maths lessons through sample analysis and reproduction

Step 1: Forming groups and assigning tasks to groups.

Step 2: Students meet in groups, assigning tasks to members and performing tasks.

Step 3: Adjusting and orienting the practice of this skill.

Step 4: Evaluating students' performance.

(b) Training Maths teaching skills for students through designing the lesson contents

Step 1: Preparing.

Step 2: Organizing practice sessions for students to apply the process of designing lesson plans.

Thus, through the implementation of this measure, students' Maths teaching skills are trained. Thanks to the organization of training these skills under the collaborative learning approach, students are guided to design lesson plans in primary schools according to the current direction of teaching method innovation.

3.3.3. Measure 3: Training teaching skills for typical situations while teaching Maths in primary schools under the collaborative learning approach

3.3.3.1. Scientific basis and the purpose of the measure

- The measure is built on the following scientific basis: Psychology, Pedagogics; Practical basis.

- The purpose of the measure: to train teaching skills for typical situations while teaching Maths in primary schools under the collaborative learning approach

3.3.3.2. Content of the measure

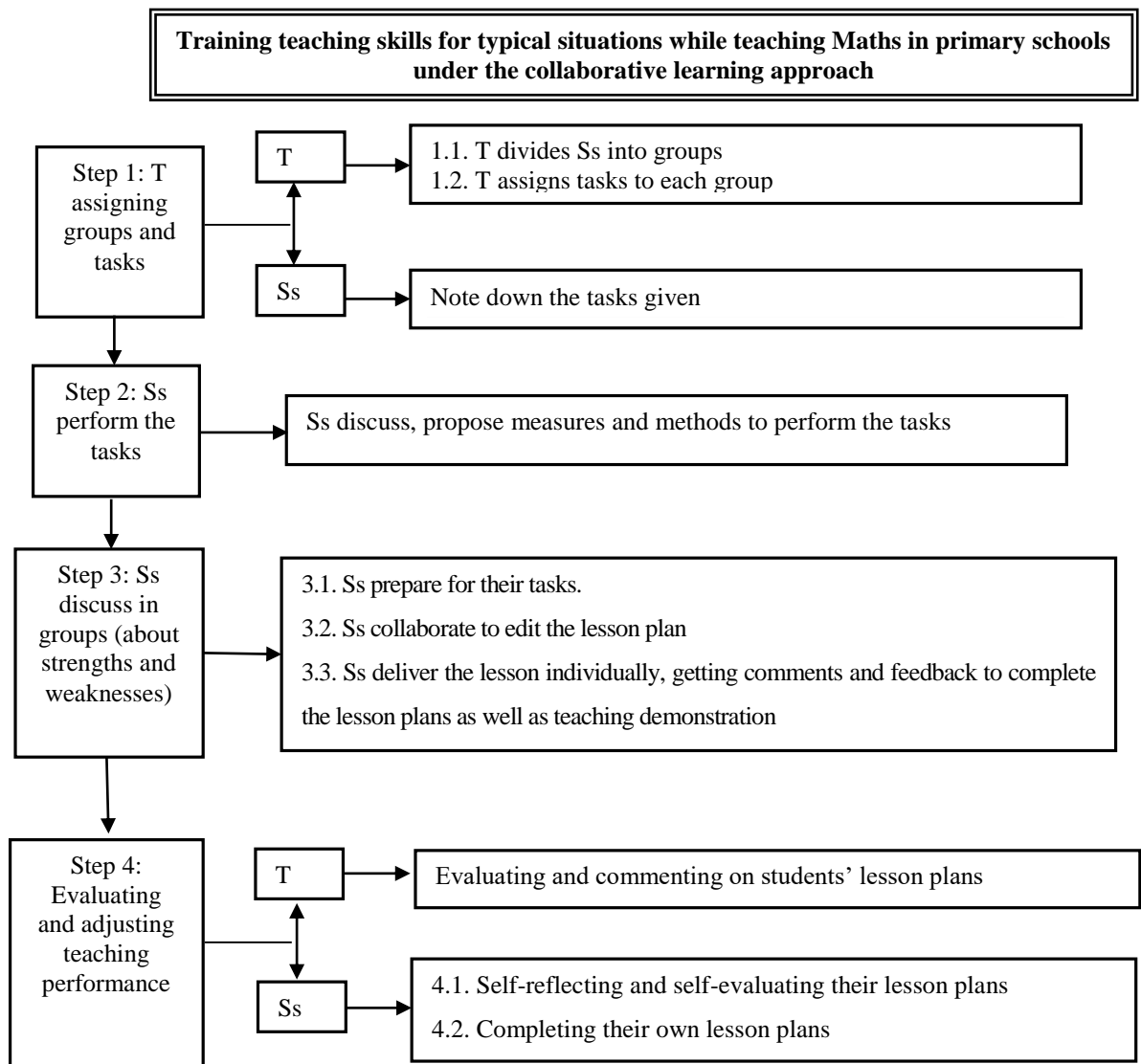


Figure 3.3. *The procedure of training teaching typical situations while teaching Maths in primary schools for students of Primary Education*

3.3.3.3. *Several notices while implementing the procedure*

On the basis of organizing for students to practice lesson planning and training Maths teaching skills in primary schools for students under the collaborative learning approach, we have generalized some teaching actions in some typical situations while teaching Maths in primary schools.

3.3.4. **Measure 4: Organizing training sessions for students to practice dealing with pedagogical situations while teaching Maths at primary schools under the collaborative learning approach**

3.3.4.1. *Scientific basis and the purpose of the measure*

- The measure is built on the following scientific basis: Psychology, Pedagogics; Practical basis.

- The purpose of the measure: to help Ss apply knowledge into solutions for pedagogical situations while teaching Maths at primary schools under the collaborative learning approach.

3.3.4.2. *The content of the measure*

In order to help Ss apply their knowledge into solutions for pedagogical situations while teaching Maths at primary schools, we can implement the following procedure:

Step	Students' activity	Teacher's activity
1	Join the group Accept the tasks given	Divide students into groups of 4-6 Assign tasks to students.
2	Study and perform tasks independently Collaborate and share with their groups about how to handle pedagogical situations	Organize students to collaborate in group Instruct students to perform the tasks
3		Guide students to organize group discussions
4	Collaborate and share with classmates	Organize class discussion.
5	Draw conclusions Compare the teacher's conclusions, self-adjust and complete the way to handle their own situations	Conclude and assess of activities of each group and each student.

3.3.4.3. *Several notices while implementing the procedure*

- Students need to study carefully Maths curriculum and content of lessons before teaching.

- After each situation is solved, it is necessary to reflect on to draw a piece of experience (or to generalize a certain feature) so that it can be applied to similar cases.

- Organizing students to practice dealing with typical pedagogical situations (while teaching Maths in primary schools) is to create opportunities for them to improve.

3.4. Conclusion

Based on the identified principles and basis, the thesis has built measures to train Maths teaching skills for students in Primary Education under the collaborative learning approach, in which:

(1) Each measure clearly defines: the scientific basis, the practical basis, the goal and the content of the measure associated with the procedure of implementing the training of Maths teaching skills for students under the collaborative learning approach.

(2) The content of each measure is built to train Maths teaching skills for students under the collaborative learning approach.

(3) In the process of implementing the measures, the teacher plays the role of organizing, guiding, and assessing the results of training; students take an active role in collaborating to collect pedagogical situations, analyzing situations and proposing solutions. Students' collaborating and sharing in handling pedagogical situations create the environment for students to practice Maths teaching skills in primary schools.

CHAPTER 4

PEDAGOGICAL EXPERIMENT

4.1. The purpose and principles of the pedagogical experiment

The pedagogical experiment aims at the feasibility and effectiveness of proposed measures to training Maths teaching skills for students under the collaborative learning approach.

4.2. Objects of the experiment

91 students (All of them must be third-year-or-above students so that the requirements mentioned in Chapter 2 can be ensured.)

4.3. The plan of the experiment

The experiment was conducted in two academic year 2013-2014 and 2014-2015 in Tan Trao university with the controlled experiment method.

4.4. The assessing and result processing criteria

Criterion 1: Proficiency of Maths teaching skills of students (through academic performance and practice).

Criterion 2: Maths teaching skills.

Criterion 3: Attitude and spirit to participate in training Maths teaching skills.

4.5. Quantitative analysis

4.5.1. Analyzing the result of the experiment phase 1

4.5.1.1. Validifying the equivalence of the input of phase 1

(1) Analyzing the academic performance of phase 1

Overall, it can be seen that the academic performance levels of experimental and controlled students are similar.

(2) Analyzing the results of Maths teaching skills of phase 1

The results of the experiment show that the skills of the two groups are not significantly different, the results of investigation into the training of Maths teaching skills under the collaborative learning approach prior to the experiment of both groups are in accordance with those of the general students as described in the current situation.

4.5.1.2. Analyzing academic performance of the experimental and controlled groups after the phase 1 of the experiment

(1) Analyze the results of training Maths teaching skills of phase 1

The experimental results show that the academic performance of students in the experimental group 1 was higher than that of the controlled group1.

The results are as follows:

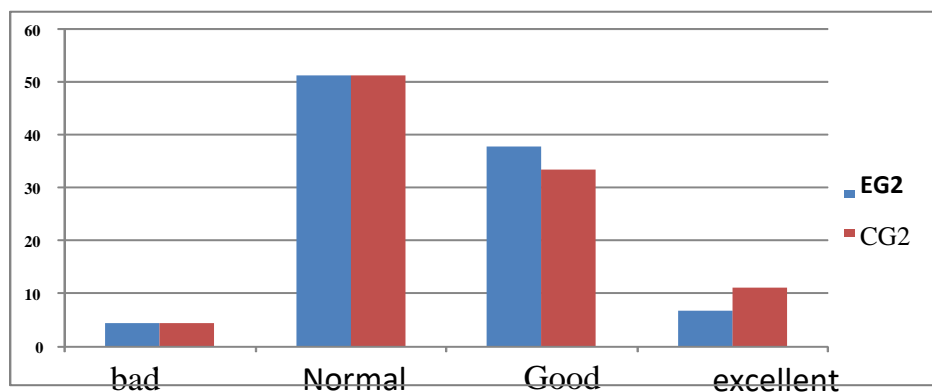


Figure 4.1. The results of Maths teaching skills of EG1 and CG1 of phase 1

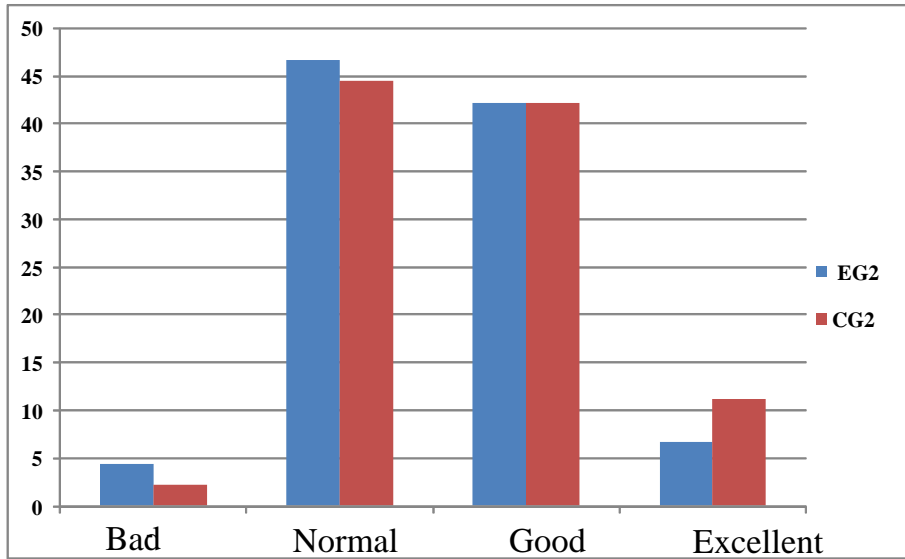


Figure 4.2. The results of Maths teaching skills of EG2 and CG2 of phase 1

(2) Analyze the academic performance of Training pedagogical skills after the experiment phase 2

The academic performance of the experimental group was higher than that of the controlled one.

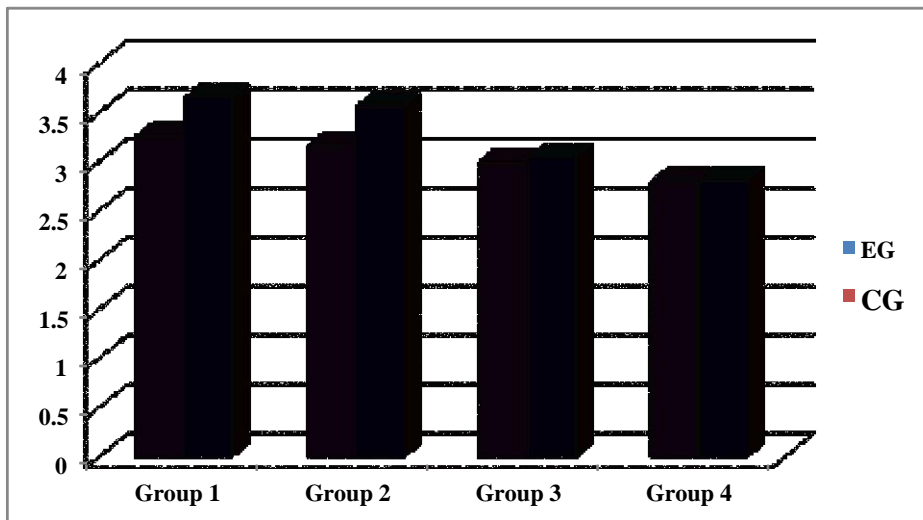


Figure 4.3. The evaluation of practicing some Maths teaching skills of students in EG and CG of phase 1

4.5.2. Analyzing the experimental results of phase 2

4.5.2.1. Validifying the equivalence of the input results of phase 2

(1). Analyzing the academic performance at the beginning of phase 2, it can be seen that the percentage of students with assessment of teaching skills at the fairly good, average, and weak-poor level of experimental group and controlled one was similar.

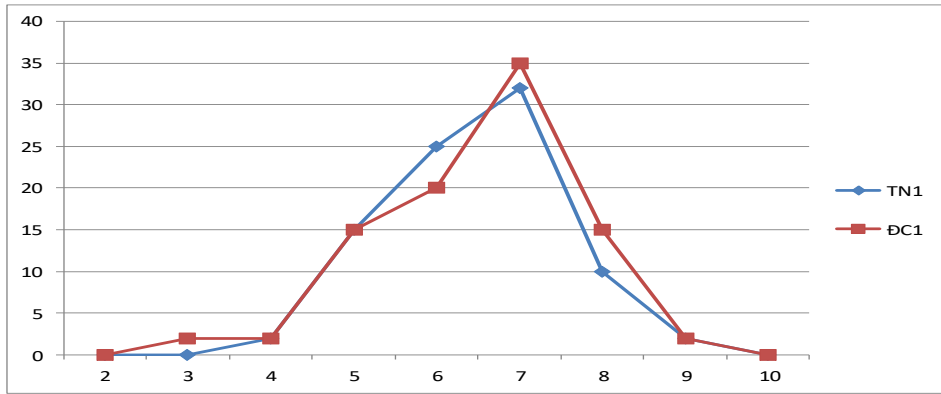


Figure 4.4. The results of Maths teaching skills of the EG1 and CG1 phase 1

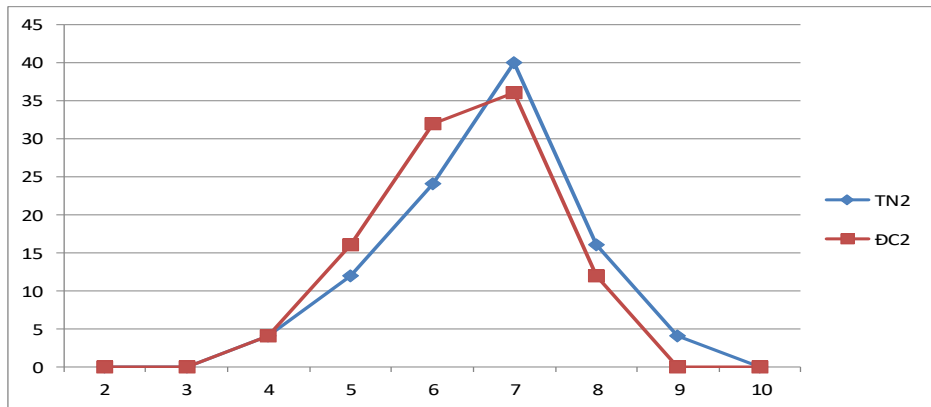


Figure 4.5. The results of Maths teaching skills of the EG2 and CG2 phase 1

(2) Analyzing the assessment of the teaching skills of the experimental and controlled groups of phase 2: After finishing the experiment, we compare the assessment scores of the teaching skills through 2 modules of Maths teaching methods and Practice teaching skills between the experimental and controlled groups.

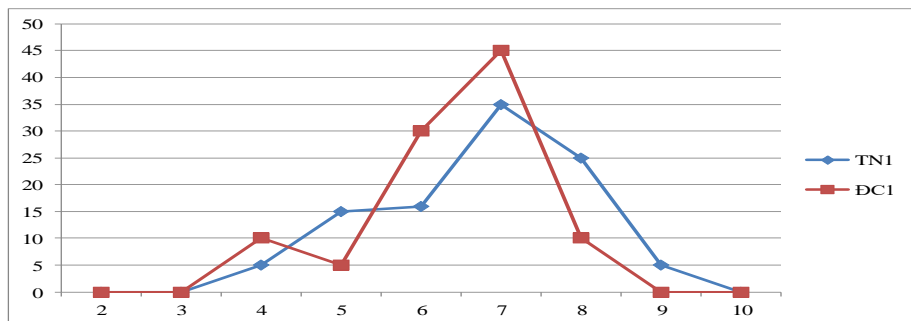


Figure 4.6. The results of Maths teaching skills of the EG3 and CG3 phase 2

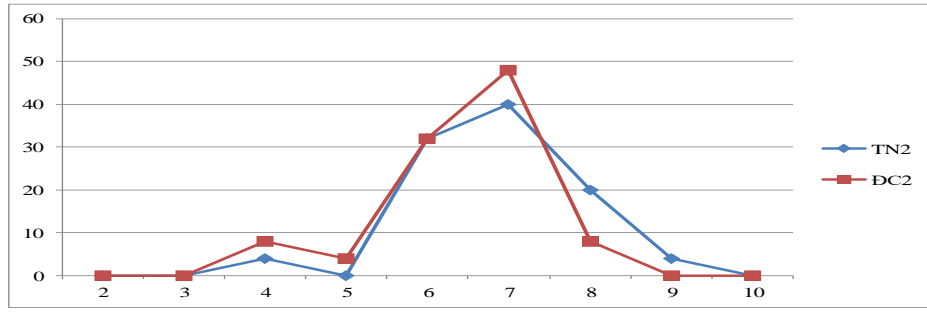


Figure 4.7. The results of Maths teaching skills of the EG4 and CG4 phase 2

4.5.2.2. Analyze the results of training Maths teaching skills of 2 experimental and controlled groups after the experiment phase 2

(1) Analyzing the results of training Maths teaching skills at the beginning of phase 2

The results of training Maths teaching skills in phase 2, the frequencies of poor, weak and average points of the experimental group were lower than those of the controlled one.

The results of training Maths teaching skills at the beginning of phase 2 are shown in figures 4.8 and 4.9 below:

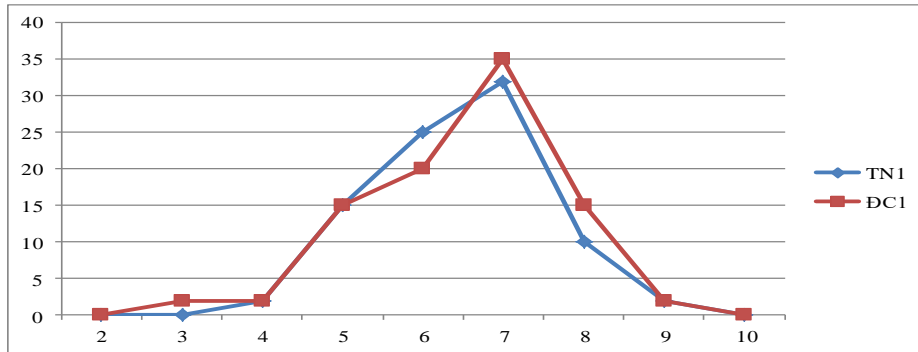


Figure 4.8. The frequency of results of Maths teaching skills phase 2 of EG1 and CG1

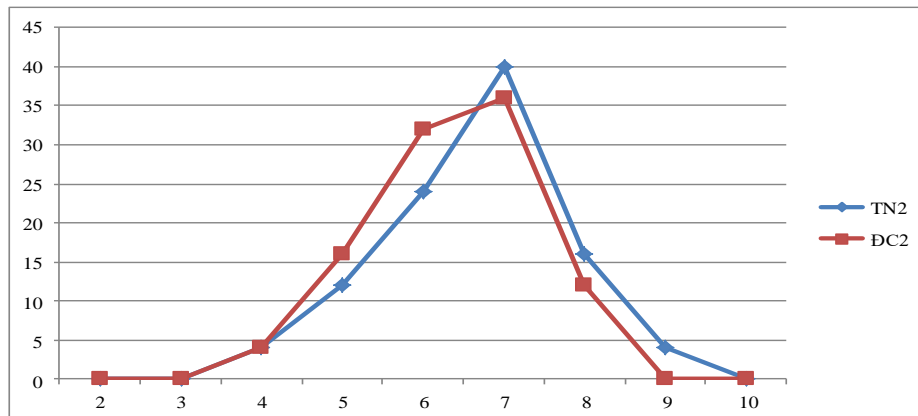


Figure 4.9. The frequency of results of Maths teaching skills phase 2 of EG2 and CG2

(2) Analyze the results of the Practice teaching skills module after experiment phase 2

Experimental results allow us to confirm that the experimental groups have more stable results than the controlled one.

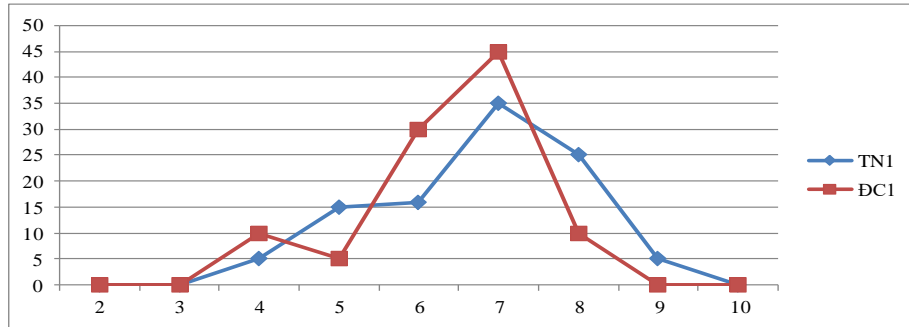


Figure 4.10. The frequency of results of Maths teaching skills phase 2 of EG3 and CG3

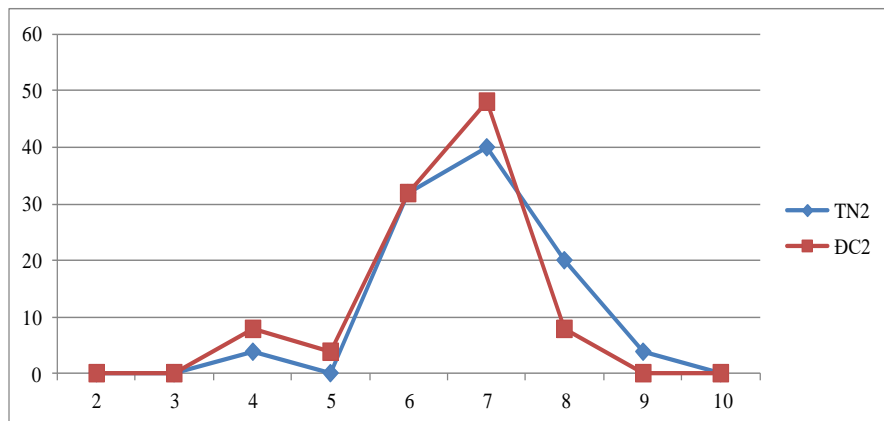


Figure 4.10. The frequency of results of Maths teaching skills phase 2 of EG4 and CG4

(3) Analysis of statistical parameters of standard deviation, median, coefficient of variation of the results of the practice of Maths teaching methods and training Pedagogical skills after the experiment phase 2.

Experimental results confirm that the assessing results of students in EG3 and EG4 are more precise and scattered around the mean value than those of CG3 and CG4. At the same time, it shows the stability of the experimental groups compared to the controlled ones.

4.6. Qualitative analysis

4.6.1. The motivation to participate in training Maths teaching skills

Observing and evaluating the cooperation of students in experimental groups, we saw that most students actively practice Maths teaching skills.

4.6.2. Consciousness of self-practicing in training Maths teaching skills under the collaborative learning approach

The role of individuals in training Maths teaching skills under the collaborative learning approach has been concretized and promoted. From the abovementioned results, it can be seen that students have recognized their own tasks and responsibilities in training Maths teaching skills.

4.6.3. The role of students in training Maths teaching skills under the collaborative learning approach

Through post-experiment survey results, students actively participate in training Maths teaching skills under the collaborative learning approach as the leader of the group.

4.6.4. Group forming while training Maths teaching skills under the collaborative learning approach

Post-experiment survey shows that practicing Maths teaching skills under the collaborative learning approach helps students to actively learn and have more skills to learn, studying in many phases with different roles.

4.6.5. Time for training Maths teaching skills under the collaborative learning approach

The amount of time for training Maths teaching skills of students is not limited to a certain extent, but it tends to expand with a larger learning environment and space with many different collaborative phases.

4.7. Conclusion

1. Training Maths teaching skills for students of Primary Education under the collaborative learning approach can be effectively applied in teaching professional subjects in universities, in accordance with teaching method through appropriate application and coordination of teaching methods.

2. Train teaching skills under the collaborative learning approach not only has a positive impact on learning efficiency but also develops Maths teaching skills for pedagogical students.

3. Training teaching skills under the collaborative learning approach helps students understand and acquire knowledge in a solid and creative way.

4. The post-experiment results at the exploration stage and after both phases are positive. Applying training Maths teaching skills under the collaborative learning approach is a correct direction for universities, contributing to improving the effectiveness of teaching and implementing training targets of universities and colleges in the current period.

5. After the experiment, the teachers who organized the training of teaching skills for students according to the proposed measures spent a lot of time preparing, organizing and guiding students to practice their teaching skills

CONCLUSION AND RECOMMENDATION

1. Conclusion

(1) The collaborative learning approach in university is the process of organizing and controlling the relationships and interactions between students and students, students and teachers, and students with materials in order to implement lesson content and develop professional skills. Therefore, the training of Maths teaching skills for students in Primary Education under the collaborative learning approach will bring high efficiency.

(2) In order to effectively deploy the training of Maths teaching skills for students in Primary Education under the collaborative learning approach, teachers need to understand the nature of the collaborative learning approach, then orient and organize for students to learn and practice Maths teaching skills in order to promote students' activeness, especially in cooperative activities during and after class time. From here, the thesis has focused on training Maths teaching skills which are designing the lessons, teaching typical situations while in teaching Maths in primary schools, and handling pedagogical situations while teaching Maths in primary schools under the collaborative learning approach. These are the Maths teaching skills which probably contain collaborative activities, exploiting well the cooperation of students with other factors to form and develop the important Maths teaching skills of students in Primary Education.

(3) On the theoretical and practical basis, the thesis has identified orientations from which to propose specific measures to train Maths teaching skills under the collaborative learning approach as follows:

i) Developing a general procedure of training Maths teaching skills for students in Primary Education under the collaborative learning approach.

ii) Training skills to design Maths lessons under the collaborative learning approach (this measure includes 2 component measures: Training skills to design Math lessons through sample analysis and reproduction; Training teaching skills for students through designing a specific lesson content).

iii) Training teaching skills in each typical situation while teaching Maths in primary schools.

iv) Organizing for students to practice skills in handling pedagogical situations while teaching Maths in primary schools.

(4) The process of conducting experiments training Maths teaching skills for students in Primary Education shows that training Maths teaching skills for students in Primary Education under the collaborative learning approach must follow the appropriate procedure and ensure the requirements of the training procedure. In the training activity, students play a key role: students consciously and self-practice Maths teaching skills under the collaborative learning approach under the strict orientation and supervision of teachers. Pedagogical experiment results have partly illustrated the accuracy of the training measures of training Maths teaching skills under the collaborative learning approach that we have proposed.

(5) Thus, the training of Maths teaching skills for students in Primary Education under the collaborative learning approach is a positive direction, contributing to the implementation of the goals, renewing the methods for training primary education teachers in universities in the current period.

The research direction of the thesis is open, so it is possible to study and propose measures to train other teaching skills for students of Primary Education under the approach of collaborative learning as well as training teaching skills for students in Primary Education under the collaborative learning approach with the application of new results on teaching methods and the application of information and communication technology.

2. Recommendation

(1) For institutions training Primary School teachers: It is advisable to organize exchange of expertise, learn from the teachers participating in the training sessions on collaborative learning approach and training teaching skills to implement the training of Maths teaching skills for students under the collaborative learning approach while training students.

(2) For researchers: It is advisable to do deep and extensive research to supplement the theoretical and practical basis for training the teaching skills under the collaborative learning approach in particular and in training teachers in general.

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