MINISTRY OF EDUCATION AND TRAINING
HANOI NATIONAL UNIVERSITY OF EDUCATION
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ORGANIZING THE TEACHING OF GRADE-12 GEOGRAPHY AT HIGH SCHOOLS FROM THE VIEWPOINT OF INTERATIVE PEDAGOGY

Major: Theory and Method of Geography Teaching
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ABSTRACTS OF SCIENCE AND EDUCATION PhD. THESIS

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INTRODUCTION

1. Reason for choosing this topic

In the rapid developing era of science and technology, in the trend of globalization and international integration, education 1, education has become a matter of leading concern for each country. Our Party and State highly appreciates the important role of education and training sector in the socio-economic development of the country, considers "*Education is the leading national policy*", "*investment in education means the investment for development"*.

2. Common education in our country is moving from the content-based education program to the capacity-based approach to promote the positiveness, activeness, creativeness, apply knowledge and skills, develop the students' capacity in learning, contribute to improving the teaching quality in schools.

Therefore, the important task of the subjects in the school today in general and Geography in particular is to also renovate the programs, textbooks, teaching and testing methods, evaluate the students' learning outcomes to promote the positiveness, activeness, creativeness for learners, towards to develop necessary skills for the students in capacity of a future employee in the industrial era 4.0, equip them a luggage to master their selves, master the knowledge, ready to have an international cooperation and integration, become a global citizen of the 21st century.

3. Objective of Grade-12 Geography Class - High School not only provides students with knowledge of natural geography, economy and society of Vietnam but also aims to develop the students with necessary capacity of an employee in the digital era, equip them a luggage to master their selves, master the knowledge, willingness to cooperate and integrate internationally. Therefore, the important task of this subject is to renovate in many fields, so as to promote the positiveness, activeness, creativeness of the learners. At the same time, help the learners to have proper attitude and behavior in the face of issues as set out to our country and humanity.

4. Teaching from the viewpoint of interactive pedagogy is a modern teaching approach, focused on the learners, pay special attention to interactive and mutual relationship between the three teaching factors as the teacher, learner and environment. The diverse involvement of the three agents is the source of dynamic relationships among them, the most characteristic factor of interactive pedagogy. As the main role, the teacher may control the teaching process, the synchronous and mutual effects to the learners and the environment will bring high efficiency for the teaching process. With active role, the learners may develop the positiveness, activeness, creativeness in interaction with teachers and friends, utilize favorable learning environment to master knowledge, form skills, develop capacity. On the other hand, a well-organized teaching environment will have a great impact on teachers, learners and teaching effectiveness.

5. Organizing the teaching from viewpoint of interactive pedagogy has brought high efficiency and is developed quite popularly in advanced countries in the world. However, in Vietnam, the application of this teaching viewpoint has been conducted in recent years, and mainly applied to teaching institutions in universities, while the subjects in upper secondary schools are not so noticeable, especially for Geography. Therefore, in the current context of education reform, the use of interactive pedagogy viewpoint in teaching Geography is very necessary to meet the demand for requirement of methodology innovation and improve teaching quality in high schools in the new stage.

Basing on aforementioned reasons, the PhD student chose the research topic "***Organizing the teaching of Grade-12 Geography in high schools from the viewpoint of interactive pedagogy***" for the PhD thesis.

2. Purposes and tasks of research

2.1. Purposes

Proposing the process and methods of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy to effectively exploit the interaction relationship between learners, teacher and environment, promote the positiveness, activeness and creativeness, develop the students' capacity in learning, contribute to the innovation of methods and improve teaching quality for Geography at high schools.

2.2. Tasks

- Studying theoretical and practical basis of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.
- Determining principles and requirements for organization of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.
- Building up a process of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.
- Proposing measures of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.
- Designing and teaching some Grade-12 Geography lessons at high schools from the viewpoint of interactive pedagogy.
- Experimenting some Grade-12 Geography lessons at some high schools to test the effectiveness and feasibility of the research topic.
- Making conclusions and recommendations for teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.

3. Subject and scope of research

3.1. Subject

Studying the process and methods of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.

3.2. Scope

- The research focuses on typical process and measures for teaching of Grade-12 Geography (basic program) at high schools from the viewpoint of interactive pedagogy.

- Experimental subjects are high-school seniors
- Experimental locations are some high schools of the northern provinces and cities: Hanoi, Hung Yen, Hai Duong and Lang Son.

4. Scientific hypothesis

If applying the process and methods of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy in a reasonable manner, ensuring the pedagogical principles and requirements, relationship between the learners and teacher will be effectively exploited, possibly promoting the positiveness, activeness, creativeness and developing students' capacity, contributing to the innovation of methods and improving the teaching quality for Grade-12 Geography at high schools.

5. Overview of research issues

5.1. In the world

Teaching from the view point of interactive pedagogy has been studied and implemented in many countries around the world. Studies were focused on key areas as follows:

- Studies on the role and interaction relationship between elements of the teaching process.
- Studies on the theoretical basis, methods and techniques of interactive teaching.
- Studies on the application of information and communication technologies in interactive teaching.

5.2. In Vietnam

Since the 1960s of the Century XX, education and training of our country has approached modern and advanced teaching opinions and methods in the world. However, the viewpoint of interactive pedagogy has been studied in recent years.

- Studies on the role and interaction relationship between elements of the teaching process.
- Studies on the theoretical basis, methods and techniques of interactive teaching.
- In the studying works of Geography teaching such.
- Studies on the application of information and communication technologies in interactive teaching.
- Studies on the application of interactive pedagogy in the teaching of the PhD. Dissertation.

6. Viewpoint and methodology of research

6.1. Viewpoint

The thesis is based on the following basic viewpoints: Systematic views; student-centered teaching views; positive teaching views; interactive pedagogy views; views on teaching technology; the viewpoint of teaching in the direction of capacity development.

6.2. Methodology

Main research methods to be used in the thesis are: Methodology of analysis and synthesis of materials; Observation; Surveying and inquiry; Case study; Professional solution; Experimental method of pedagogy; Mathematical statistical methods.

7. New contributions of the thesis

7.1. In terms of theoretical aspects

- Contributing to clarifying the theoretical foundation of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.
- Describing the principles and requirements for teaching of Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.
- Building up a process of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.
- Proposing measures for teaching Grade-12 Geography from the viewpoint of interactive pedagogy in a reasonable and effective way.
- Designing and teaching some Grade-12 Geography lessons at high schools from the viewpoint of interactive pedagogy.

7.2. In terms of practical aspects

- Survey, inquiry and evaluation of the teaching status of Grade-12 Geography at high schools from the viewpoint of interactive pedagogy have been conducted.
- The feasibility and effectiveness of the research subject in pedagogical experiment at high schools have been verified.
- Advantages of teaching from the viewpoint of interactive pedagogy have been confirmed in promoting the positiveness, activeness, creativeness and development of students' capacity.

8. Structure of the thesis

Apart from the introduction, conclusions and recommendations, reference materials and appendices, the thesis contains 3 chapters:

Chapter 1: Theoretical and practical basis of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.

Chapter 2: Procedures and Methods for teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.

Chapter 3: Pedagogical experiment.

Chapter 1. THEORETICAL AND PRACTICAL BASIS OF TEACHING GRADE-12 GEOGRAPHY AT HIGH SCHOOLS FROM THE VIEWPOINT OF INTERATIVE PEDAGOGY

1.1. Popular issues on innovation of general education

1.1.1. Orientation to renovate the general education program

General education is moving from content orientation to capacity orientation program. Capacity-orientated curriculum may not specify specific curriculum contents other than desired results of educational progress, thereby providing general

guidelines for selection of contents, methodology, organization and evaluation of teaching results to ensure the execution of teaching objectives, i.e. achieving the output desired results.

1.1.2. Orientation for renovation of teaching and testing methods and evaluation at high schools

- Innovating teaching methods to focus on the development of students'' capacity.
- Some measures to innovate teaching methods.
- Innovation in examining and evaluating the students' learning results.

1.2. Basic contents on interactive pedagogy

1.2.1. Concept on interaction and interactive pedagogy

- *Concept of interaction*

Interaction is the mutual direct impact between the learners and teacher and between the learners on their own in an educational environment in order to perform the learning tasks and defined teaching objectives.

- *Concept of interactive pedagogy*

Interactive pedagogy is a modern teaching approach that focuses on learners on the basis of interaction between three basic elements: learners, teacher and environment. Interactive pedagogy defines the role of agents, operations and interactions to enhance the value of interactions in the teaching process.

1.2.2. Scientific basis of interactive pedagogy

1.2.2.1. Biological basis of learning activities

Applying the learning machine to the teaching process for both instructor and learners to have a proper treatment for the operation of nervous system to bring the effectiveness in teaching. Sensory organs play an important role in the process of human cognition, which should be activated in both learners and the instructor to work in a best way for purpose of learning.

1.2.2.2. Basis of psychology of learning activities

a) *Learning activities* are activities directly directed at the acquisition of knowledge, formation of skills and techniques, thereby transforming the subject of such activity. The subject of learning activity is the learners, who have the tasks of gaining knowledge, skills and techniques, thereby forming the creative ability and developing intellect for themselves.

b) *Learning strategies* are complex modes, at various levels, whether or not they are intended to achieve learning goals. (J. Lompscher, 1996). These include cognitive learning strategies, metacognitive learning strategies, and strategies for using internal and external resources.

c) Learning theories

- *Cognitivism*: The cognitive theory studies inner cognitive processes as a process of information processing. Applying cognitive theories in interactive teaching to optimize the teaching process, develop students' cognitive capacity, especially the

development of students' thinking. Notable teaching methods include problem-solving teaching, action-oriented teaching, exploration teaching, group teaching.

- *Social cognition theory*: Social cognition theory (SCT) refers to a pattern of psychological behavior that appears primarily from the work of *Albert Bandura (1977; 1986)*. Applying the strengths of social cognition theory in *interactive teaching on* classroom is to provide a clear foundation for classroom interventions to be designed to improve students' learning.

- *Social and cultural theory*: This theory suggests that the social interaction may lead to continuous step-by-step change in students' thinking and their behavior can vary greatly from the cultures. As defined by Vygotsky, not only interpersonal interaction between students and teachers or students and their friends but also broader social, cultural and historical influences on learning and learning environment. .

- *Tectonic theory*: By tectonic theory, each learner is an active constructing process, self-reflection to the world in its own experience. Applying tectonic theory in interactive teaching will promote the positiveness, activeness, creativeness and develop the students' capacity in learning. The teacher's role is no longer a knowledge transferor, but a constructive learning environment organizer. *The learning environment as mentioned here is an interactive environment where the learners acquire knowledge on their own through interaction with learning contents and social interaction between the students in the learning process*.

- *Multiracial theory*: According to Gardner's theory, intelligence includes the ability to create and solve problems that create products or provide services that are highly valued in a culture or society. Applying Gardner's multidisciplinary theory to interactive teaching will promote the intelligence of each student at different levels, mobilize the work of both students' brain hemispheres in learning process.

1.2.3. Elements of interactive pedagogy

1.2.3.1. Factors

Structure of "Interactive Pedagogy" is to consider the interaction mechanism in the triangular relationship: Learner - Teacher - Environment. These factors mutually interact and support to achieve learning goals.

1.2.3.2. Operations

Operations include: learning methods, pedagogical methods, and impact of surrounding environment on learners and teacher.

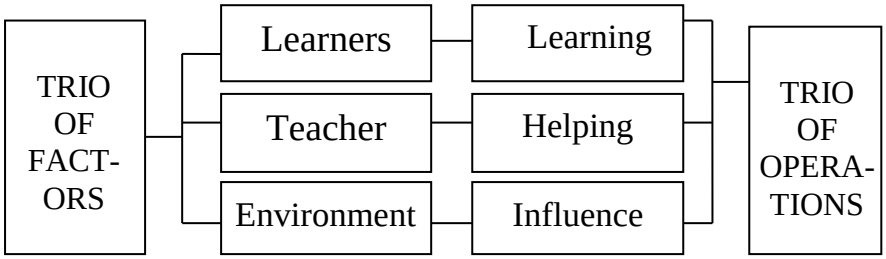

Figure 1.3. Trio of agents and their operations

1.2.3.3. Interactions

This interactive relationship can be represented by the interactive triangle diagram as follows:

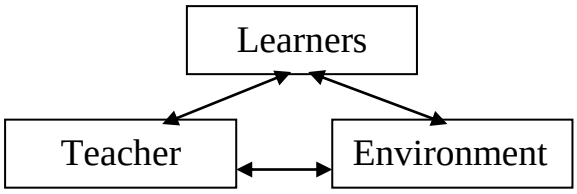

Figure 1.4. Their interactions and interactions

- Interaction between Teacher and Learners
- Interaction between Learners and Learners
- Interaction between Teacher - Learner - Environment

Of which, the mutual relationship between Learners - Learners is especially important.

1.2.4. Basic features of interactive pedagogy

- Highlighting the role of learners, teacher and educational environment
- Interactive pedagogy follows three basic principles
- Emphasizing the interaction between the learners, teacher and environment.
- Compare traditional teaching and interactive teaching methods

1.3. Characteristics of psychology and cognitive capacity of Grade-12 students, high school

1.3.1. Psycho-physical characteristics of Grade-12 students, high schools

This is the age of important changes in the students' psychology. They have grown up and are achieving perfection and physicality. They are more interested in each other, more confident, more concerned about the issues of life and have directions for their future. The need for expressing their opinions and ego is quite clear so the desire to communicate, exchange and contribute is increased. They want to be recognized and valued as a mature member of society.

1.3.2. Cognitive characteristics of Grade-12 students - high school

1.4. Objectives and contents of Grade-12 Geography, high school

1.4.1. Objective of Grade-12 Geography, high school

- In terms of knowledge: Having completed the Grade-12 Geography program, the students need to understand natural features, natural resources, population, economics, and a number of issues being addressed for rational use, reduce the consequences of natural disasters, improve the quality of life for the people, the socio-economic development of the country as well as the territories and localities where the students live.

- In terms of skills: To consolidate and develop geographic skills to further develop geographic thinking, i.e., integrated thinking, territorial thinking, and regular contact with life and production.

- In terms of attitude, affection: The students may have a deep love to their homeland, the country, the spirit of national self-reliance and the belief in the future of the nation, reinforce the students with scientific worldview, proper way of looking at life, sense of responsibility in environmental protection, socio-economic building in the locality.

1.4.2. Structure and content of Grade-12 Geography, high school

The program has the following major components: Vietnam on the road of innovation and integration; Natural Geography; Economic Geography; Local Geography; Review and Test.

1.4.3. Ability to organize interactive teaching through Grade-12 Geography - High School

- Objective of Grade-12 Geography - High School program is to create a basis for effective interaction.

- Putting the reality of Vietnam in the content of Grade-12 Geography - High School program to meet the highest requirements of interactive teaching organization.

- Grade-12 Geography program and contents facilitates the organization of effective interactive teaching.

- Local geographic contents are a “fresh piece of land” that creates interactivity in the teaching process.

1.5. Current status of teaching Grade-12 Geography from the viewpoint of interactive pedagogy at high schools

1.5.1. Objectives, objects, methods and contents of the research

1.5.1.1. Purposes of the study

Teaching from the viewpoint of interactive pedagogy have been conducted in recent years in Vietnam. So, the way that the viewpoint of interactive pedagogy is applied at high schools today may reflect the teachers’ perception or not. How did they actually use it? In the process of applying this teaching point of view, what difficulties did they face? ...

1.5.1.2. Subjects to be investigated

Subjects for the survey and inuiry are some educational administrators and teachers who are teaching directly and students at high schools in Hanoi, Hung Yen, Hai Duong and Lang Son provinces.

1.5.1.3. Survey contents

Contents of survey and getting to know about:

- Teachers’ perceptions of interactive pedagogy, the importance of interactive relationship among factors in the teaching process.

- Methods, techniques, teaching aids, ICT ... the teachers often use to organize interactive teaching.

- Survey on the ability and learning needs of Grade-12 students.

- Survey on elements affecting the students’ learning results

- The actual situation of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.

1.5.1.4. Inquiry method

The thesis was conducted by anket sheet. Contents of the survey is expressed in question form. Each teacher is sent a questionnaire to study and answer the questionnaire. Results from the questionnaire will be processed and statistically analyzed using mathematical statistics.

1.5.2. Results of studying the actual situation of teaching Grade-12 Geography from the viewpoint of interactive pedagogy at high schools.

1.5.2.1. On the teacher side

- The teachers' cognition about teaching Geography from the viewpoint of interactive pedagogy at high schools.

- The application of methods and techniques to the teaching of Grade-12 Geography from the viewpoint of interactive pedagogy at high schools

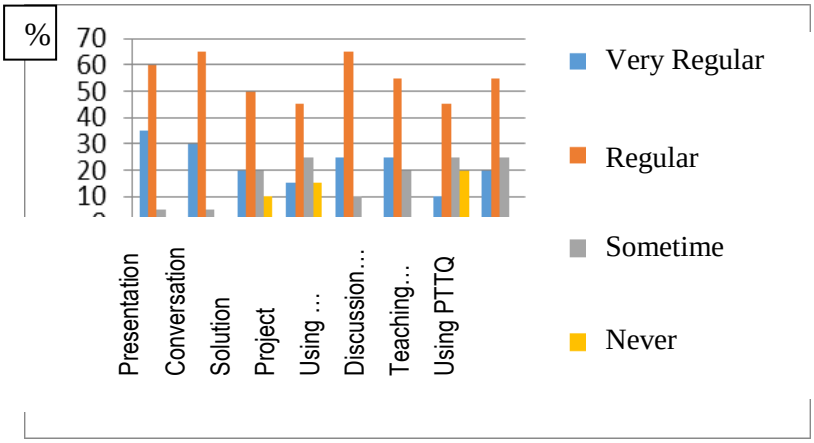

Figure 1.6. Frequency of using methods in teaching Grade-12 Geography

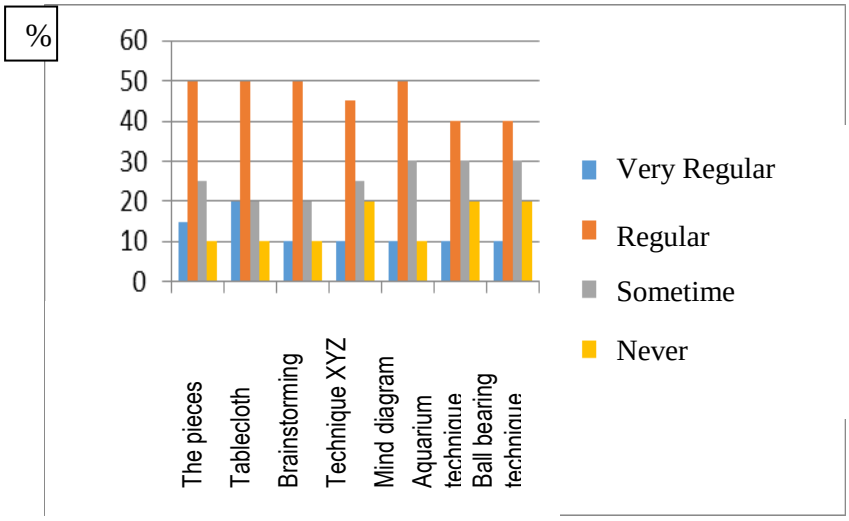

Figure 1.7. Frequency of using techniques in Teaching Grade-12 Geography

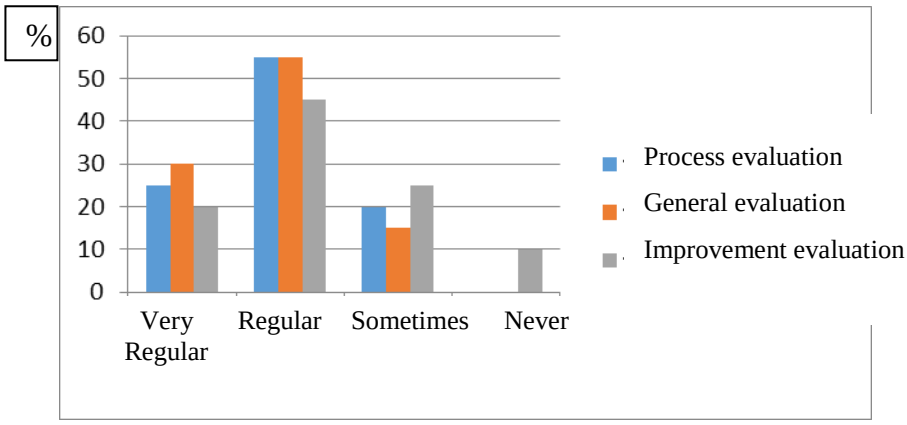

Figure 1.8. Frequency of using form of testing and evaluation of students' learning results

1.5.2.2. On the side of students

1.5.2.3. Cause of the situation

Chapter 2. PROCEDURES AND METHODS FOR TEACHING GRADE-12 GEOGRAPHY AT HIGH SCHOOLS FROM THE VIEWPOINT OF INTERATIVE PEDAGOGY

2.1. Principles and requirements for teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.

2.1.1. Principles for teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy.

2.1.1.1. Ensuring Grade-12 Geography lesson objectives.

2.1.1.2. Ensuring teaching 12 tutorial "training into people all people will be active and be interactive "

2.1.1.3. Ensuring the science and pedagogy nature

2.1.1.4. Ensure the systematic and synchronized features of measures that impact on the interactive teaching in Grade-12 Geography.

2.1.1.5. Ensuring the effectiveness and feasibility of measures

2.1.2. Requirements for teaching Grade-12 Geography from the viewpoint of interactive pedagogy.

2.1.2.1. Teaching Grade-12 Geography from the viewpoint of interactive pedagogy creates atmosphere of participating excitement and ebullience for the learners.

2.1.2.2. Teaching Grade-12 Geography from the viewpoint of interactive pedagogy must meet the needs and interests of studying, promote the positiveness, self-awareness, activeness, creativity and development of students' capacity.

2.1.2.3. Teaching Grade-12 Geography from the viewpoint of interactive pedagogy must promote the effectiveness of interactive relationships between the learners, teacher and environment.

2.1.2.4. Teaching Grade-12 Geography from the viewpoint of interactive pedagogy must build a safe and friendly learning environment.

2.2. Process of teaching Grade-12 Geography from the viewpoint of interactive pedagogy

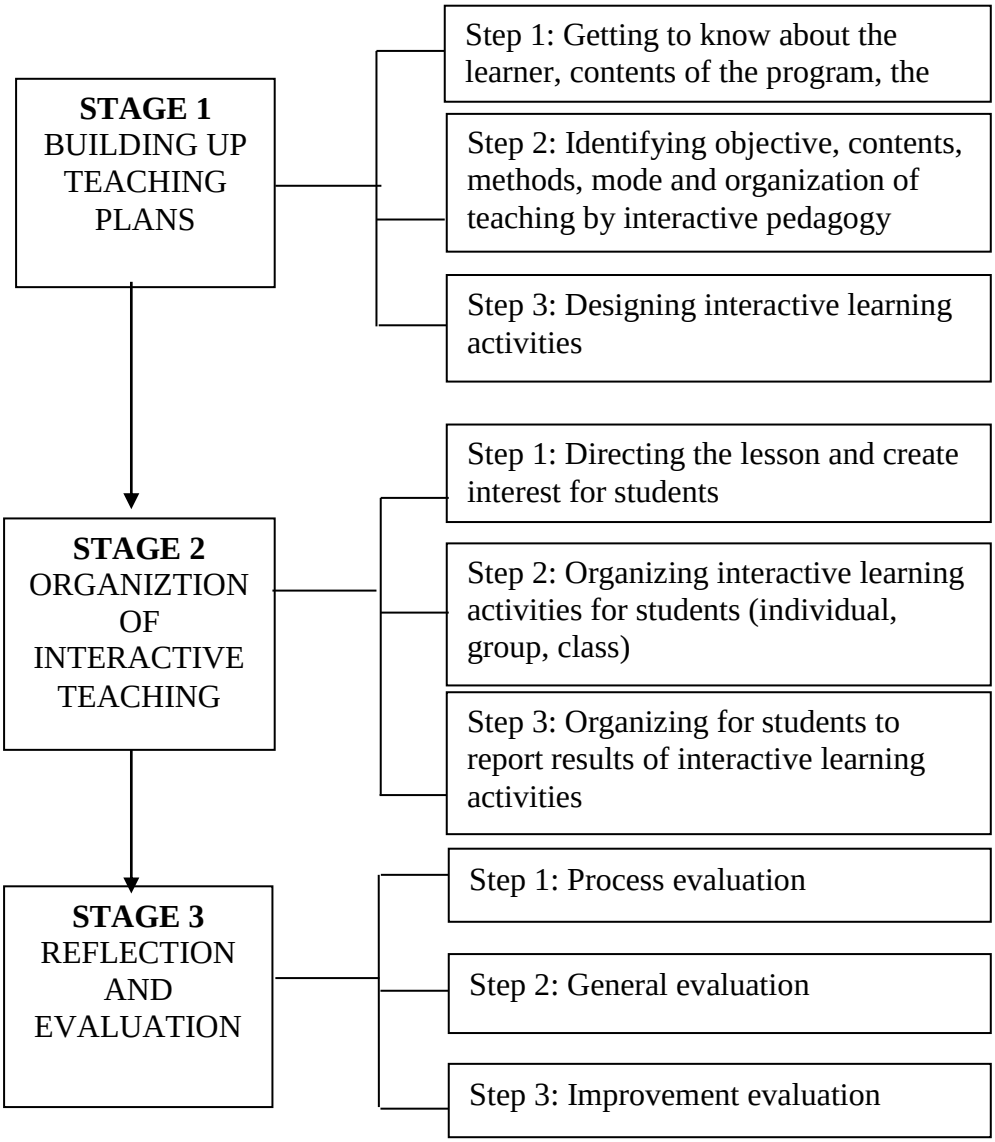

Figure 2.1. The process of teaching Grade-12 Geography from the viewpoint of interactive pedagogy

2.2.1. Stage 1: Building up lesson plans

Building up lesson plans is a very important part of teaching. This requires the trainer to well prepare before getting to class, so the teaching process is at high effectiveness. Applying the viewpoint of interactive pedagogy to build up the lesson plans is to identify the goals and contents of the unit that can provide the best and most interactive, and application of interactive teaching is highly effective.

Step 1: Getting to know about the learners, subject curriculum

Prior to developing and implementing the lesson plans, the teacher needs to understand the family circumstances, academic performance, etc. of the students in the class. Basing on the understanding of learners, the teacher may determine target of each lesson in accordance with the program and in compliance with level and style of the students in the class, as well as build up a convenient learning environment for

the learners. Under the permissible circumstances and conditions, the teacher should conduct tests to assess and validate students before planning a new lesson.

Carefully understanding the objectives, contents of the subject, lessons and standards of skills to build the idea of organizing learning activities.

Applying the formula CIA (Content, Idea, Activities) and formula EDUCARE? (Explanation, Doing detail, Use, Check and Correct, Aids memoire, Review and reuse, Evaluation,?) to design the lesson.

Step 2: Identifying the objectives and contents of the lesson, selecting appropriate methods, means and teaching forms to organize learning activities of the students.

In the process of developing the lesson plans, the teacher must rely on: curriculum contents and textbooks, teacher books, students' levels, current teaching conditions to:

- Identify learning objectives, knowledge, skills, attitudes and competencies.
- Identify learning contents and related knowledge to organize learning activities effectively.
- Identify methods, means and teaching forms capable of organizing the most effective interaction.
- Estimate teaching process, time and method of accessing teaching contents.

Step 3: Designing interactive learning activities to meet learning objectives

Basing on the objectives, contents of the lesson, the teacher may design interactive learning activities, various forms of activities to maximize the positiveness, activeness, creativeness, use of knowledge , skills in addressing learning tasks, forming qualities and capacity of students. Each learning activity demonstrates the contents, the way it is carried out, the steps and the means of learning, etc., in order to effectively enhance the interaction between the learners, the teacher and the environment.

2.2.2. Stage 2: Interactive teaching organization

Step 1: Orienting the lesson, creating excitement for the students

The goal is to help the students raise their knowledge, skills, experiences related to new lessons, stimulate curiosity, desire to learn new lessons, train students to sense ability, form the initial symbols of concepts, knowledge, ability to express, calculate, propose strategies, capacity of thinking, confirm the task of learning new lessons.

Step 2: Organize of interactive learning activities for students

The purpose of this activity is to help students understand contents of the lesson, to train students to be aware of the concept of science; the students acquire knowledge, skills, attitudes and develop capacity to meet the goals of the lesson.

In this step, the following activities usually occur:

- Teacher may assign learning tasks to the students
- Students' learning activities (individual, group, whole class)
- Organizing the students to report learning products
- Evaluation of learning products

In the process of organizing interactive learning activities for students to achieve the goal of the lesson, it is required to pay attention to the interaction between three elements (teacher, learners, environment) to promote the positiveness, activeness, creativeness of the students in learning activities.

- The interaction between three elements (teacher, learners, environment)
- Stimulating the positiveness, activeness, creativeness, cooperation among class members, mobilizing the students' experience in the process of acquiring knowledge.
- Creating inner enjoyment; creating excitement outside; creating challenges; creating cooperation.

Step 3: Organizing for the students to report on interactive learning results

At the end of group work, the teacher may organize for the students to report on their product and exchange ideas and comments with each other. The teacher can instruct students to supplement and correct learning products.

2.2.3. Stage 3: Reflection and evaluation of learning results

Step 1: Process evaluation

Assessing the progress and breakthrough of the students through learning activities is regularly feedback to maintain academic progress. At the same time the teacher have grounds to adjust the way of teaching, learning methods and plans, educational programs.

Step 2: Periodic assessment / summarization

Assessment of the students' performance through testing and examination to determine the students' performance after a specified period of time (one semester, one academic year, one semester level of education). In addition, as with other forms of assessment, educators and teachers receive useful information to review and adjust (if needed) to improve, renovate teaching methods, renovate the way of testing and evaluation according to the orientation of students' capacity development.

Step 3: Improvement evaluation

Improvement evaluation is considered to be the last step in completing a certain teaching cycle (either a lesson, a chapter, or even an entire curriculum), and to orient the new values to the next teaching cycle.

Overall, improvement evaluation is a reevaluation of the *built-in teaching plans and the implementation of that plan* (in some foreign materials, it is called reflection).

2.3. Measures to teach Grade-12 Geography at high schools from the viewpoint of interactive pedagogy

2.3.1. Diverse and effective use of positive teaching methods and techniques in teaching Grade-12 Geography

2.3.1.1. Diverse and effective use of teaching methods

a. Group teaching methods

Objectives of the method: Organizing the students to study in groups not only promote the positiveness, activeness, creativeness in students' cognitive activities,

facilitate for people to participate, find solutions, develop action plans, analyze information, share experiences, learn from each other, prepare for the division of cooperative labor in the community but also through this learning, many skills and capacity is also formed and developed as: communication capacity; problem solving capacity; cooperation capacity; develop critical appraisal skills; speaking skills; the skill of documentary collection; reporting skills, etc.

Mode of implementation:

Step 1: Work together with whole class: The teacher may raise issue, identify cognitive tasks for students; organize groups and assign tasks to groups of students; instruct the team how to work.

Step 2: Work in groups: Discuss in groups / or; assigning tasks in groups, individuals working independently and exchanging group discussions; the representative will present the results of the work.

Step 3: Discussion before the whole class: Groups (or representatives of one or two groups) report the discussion results of the group; whole class discussion; the teacher will summarize, evaluate and discuss the next lesson or next issue.

b. Project-based teaching methods

Objectives of project-based teaching:

Project-based teaching aims to promote positiveness, activeness, creativeness and develop cooperation capacity, the ability to solve complex problems in students' learning, and contribute to linking theory and practice, thinking and acting, school and society.

Mode of implementation:

The project-based learning process can be conducted in five stages: Identifying the topic and objectives of the project; preparation of project implementation plan; project implementation; presentation of project products; project evaluation.

c. Methods to set and solve the problem

The goal of the method is to help students take responsibility for their own learning; develop writing and speaking skills; develop problem solving and decision making skills.

Mode of implementation:

- Setting the problem, building the cognitive problem: Creating the problematic situation, detecting and identifying incurred problem, stating the problem to solve.

- Problem solving: Proposing hypotheses, making plans for solving problem, implementing plans to solve the problem.

- Conclusion: Discussing the results and evaluating, confirming or rejecting the hypothesis, stating the conclusion, proposing a new issue.

d. Method of using the map

Objectives of the method:

- The students use knowledge and mapping skills and geographic knowledge to

exploit hidden geographic knowledge on the map to gain new geographic knowledge and skills in the learning process.

- Defining the location, characteristics of the features displayed on the map.

- Combining mapping knowledge with deeper geographic knowledge to compare, analyze and find relationship among geographic features, especially geographic causal relationship on the map to draw knowledge and geographical conclusions.

Mode of implementation:

- The teacher assigns learning tasks to students (group or whole class) through question or problem contents related to the map, the students must work with the new map that can solve the task of learning (e.g., comment on the flow direction, characteristics, features of the Red River on the map)

- Students observe the wall-map, the map in the textbook, and in the Atlat Vietnam booklet to identify, describe, and comment on the characteristics and properties of the objects and features shown on the map (for example, the Red River originates in Yunnan China, flowing into our country in the direction of northwest-southeast and to the Gulf of Tonkin. The river has a length of 1126 km, the middle and lower reaches 556 km in length, with high water and sediment content, etc.)

When reading a map, the students must combine map knowledge with geographic knowledge to compare, analyze, and find relationship between things, geographic features, especially the causality is shown on the map to draw new and potential comments and conclusions on the map.

e. Discovery teaching methods

The goal of discovery teaching: Discovery teaching is to promote the positiveness, activeness, creativeness and develop capacities of thinking, cooperative capacity, capacity to solve complex problems in learning of the students, contributing theory to practice, thinking and acting, school and society.

Mode of implementation: Process ***5E*** is a process quite popular when it comes to discovery teaching. ***5E*** is an acronym for 5 steps of discovery: Engage; Explore; Explain; Elaborate; Evaluate.

2.3.1.2. Effective use of active teaching techniques

The techniques such as: brainstorming; tablecloth; pieces; XYZ, Mind Mapping.

2.3.2. Effective use of visual aids in teaching Grade-12 Geography

2.3.3.Strengthening the use of ICT applications in teaching Grade-12 Geography

2.3.4. Innovating the examination and evaluation of learning results of students

2.4. Design and organization of teaching some lessons in Grade-12 Geography from the viewpoint of interactive pedagogy

- Lesson 14, 15. Special subject: Use and protection of nature
- Lesson 16. Population characteristics and population distribution in our country
- Lesson 32. Exploitation of strengths in the Midlands and Northern Mountains

Chapter 3. PEDAGOGICAL EXPERIMENT

3.1. Purposes and tasks

3.1.1. Experimental purpose

Pedagogical experiment is considered to be the last stage of the applied pedagogical scientific research cycle: Thinking - experiment - verification. The purpose of pedagogical experiment is to test the feasibility and effectiveness of teaching Grade-12 Geography from the viewpoint of interactive pedagogy. At the same time, contributing to clarifying the theoretical and practical basis and scientific hypothesis of the research topic.

3.1.2. Experimental tasks

- *Building up the experimental organization plans*: Defining the experimental purpose; experimental type; selection of contents, methods, subjects, geographical areas, time of experimentation; designing experimental lesson plans; design of experimental measurement tools.

- *Experimental organization*:

Experiment in three lessons: 01 lesson on natural geography, 01 lesson on population geography, 01 on socio-economic geography, at 4 high schools in rural, mountainous and urban areas.

- *Evaluation of experimental results*: The purpose of this task is to evaluate the feasibility and effectiveness of teaching Grade-12 Geography from the viewpoint of interactive pedagogy. On such basis, drawing conclusions and recommendations to further improve and deploy research results to meet the requirements of modern education.

3.2. Empirical principles

Experimental teaching of Grade-12 Geography from the viewpoint of interactive pedagogy must ensure the principles: *Ensuring scientific aspects, ensuring objectivity, ensuring practicality*.

3.3. Experimental method

3.3.1. Selection of experimental method

To verify the feasibility and effectiveness of the research topic, the thesis author selected the experimental method: Pre and post test design with similar groups. This design uses two groups (all two classes) equivalently to make the experimental group and the control group.

- Conducting experiments in two groups, which were taught traditionally for the control group and organize interactive teaching for the experimental group.

- After each experimental lesson, conducting to check the quality of students' learning in both groups in an objective manner. The checking contents includes testing of students' knowledge, skills, attitudes and capacity after each lesson.

3.3.2. Method for evaluating experimental results

3.3.2.1. Measurement and collection of data

- Building up tools to measure experimental results (before and after impact).

- Measuring and collecting experimental results: Measuring knowledge, skills, attitudes, capacities, reliability and validity.

- Conducting and analyzing experimental results: Using the independent T-test to compare the mean values of the two groups and the influence. In the T-test, we usually calculate P value, where P is the probability of occurring randomly. P is usually defined as P <= 0.05. P is explained as follows: P <= 0, 05 meaningful; P> 0.05 non-meaningful).

- *Describing the data*

Two main ways to describe data are concentration and dispersion. Concentration describes where the "center" of the data located. The statistical parameters of concentration are *Mode, Median, and Average.*

- Formula for arithmetic mean in Excel:

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

Of which: $\overline{X}$: is arithmetic mean
n: Number of students
x_i: Score value
f_i: frequency of x_i

- Standard deviation S: Standard deviation reflects deviation or oscillation, dispersion of the data around the arithmetic mean between the experimental and control groups. The smaller the standard deviation, the higher the result such group has.

Calculating the standard deviation of Stdev (number 1, number 2 ...) in Excel:

$$S = \sqrt{\frac{\sum f_i (x_i - \overline{X})^2}{n-1}}$$

Of which: S: Standard deviation
x_i: Score value
$\overline{X}$: arithmetic mean
n: participated students of each group
f_i: frequency of x_i

- *Effect standard (ES)*

The effect standard indicates the magnitude of the effect. The standard mean difference (SMD) is the measure of the measurement tool of the effect. The formula to calculate the effect using the difference of standard average value of Cohen (1998) is presented in the table below:

$$SMD = \frac{\text{Average value}_{\text{Experimental group}} - \text{Average value}_{\text{Control group}}}{\text{Standard deviation}_{\text{Control group}}}$$

3.3.2.2. Review and evaluate the experimental results, draw conclusions about the feasibility and effectiveness of research topics.

- *Quantitative evaluation*: Using mathematical statistics and Excel, SPSS software to process data after experiment.

- *Qualitative assessment*: Through hour-teaching attention and discussion with the subjects and through students' work, making comment on the students' spirit, attitude, and sense of learning through the results of the questionnaires given to the students and the teacher's comments.

3.4. Experimental procedure

3.4.1. Experimental preparation

3.4.1.1. Select empirical content

- Lesson 14 and Lesson 15 (*topic building*): Use and protection of nature
- Unit 16. Population characteristics and population distribution in our country
- Lesson 32. Exploitation of strengths in the Midlands and Northern Mountains

3.4.1.2. Selection of experiment object

3.4.1.3. Selection of experimental site:

Selecting 4 high schools to conduct experiments on behalf of schools in cities, plains and mountainous areas. Specifically:

1. Kim Thanh High School, Hai Duong Province
2. Tran Quoc Tuan High School, Hanoi
3. Khoai Chau High School, Hung Yen Province
4. Viet Bac High School - Lang Son City, Lang Son Province

In each of these schools, selecting two class, of which, there is a control class and an experiment class. Students in the control and experimental classes have the same number and level of learning.

3.4.1.4. Experimental time:

The author conducted the survey and pedagogical experiment in the school year: 2015-2016; 2016-2017.

3.4.2. Experimental organization

Teachers in each experimental school will teach three lessons in both experimental and control classes to facilitate the comparison of experimental results between the both experimental classes in each experimental site.

- *Experiment 1*

Lesson 14, 15 (Special subject): Use and protection of nature

- *Experiment 2*

Lesson 16. Population characteristics and population distribution in our country

- *Experiment 3*

Lesson 32. Exploitation of strengths in the Midlands and Northern Mountains

3.4.3. Experimental results

3.4.3.1. Students' awareness and attitude in experimental teaching hours

3.4.3.2. Summary of testing results after 3 experimental lessons in 4 schools

Table 3.3. Summary of post-experiment results in 4 schools

Experimental schools	**Class**	**Total number of student**	**Test Score**							$\overline{X}$
			4	**5**	**6**	**7**	**8**	**9**	**10**	
Kim Thanh High School, Hai Duong Province	Exper.	43	0	0	3	6	12	19	3	8.3
	Contr.	42	2	3	9	10	8	9	1	7.1
Tran Quoc Tuan High School, Ha Noi	Exper.	40	0	1	2	6	10	17	4	8.3
	Contr.	40	2	4	8	13	6	6	1	7.0
Khoai Chau High School, Hung Yen Province	Exper.	44	0	2	4	5	10	18	5	8,2
	Contr.	45	2	4	5	20	9	4	1	7,0
Viet Bac High School - Lang Son Province	Exper.	42	0	2	2	8	10	18	2	8,1
	Contr.	42	2	4	8	16	6	6	0	6,9
Total	**Exper.**	**169**	**0**	**5**	**11**	**25**	**42**	**72**	**14**	**8,2**
	Contr.	**169**	**8**	**15**	**30**	**59**	**29**	**25**	**3**	**7,0**

Table 3.4. Rate of test scores after 3 experimental lessons in Kim Thanh High School

Experimental schools	**Class**	**Total number of student**	**Test Score (%)**			
			Distinction	**Good**	**Average**	**Weak**
Tran Quoc Tuan High School, Ha Noi	Exper.	43	51,2	41,8	7,0	0,0
	Contr.	42	27,6	42,8	28,5	1,1

Table 3.6. Rate of test scores after 3 experimental lessons in Tran Quoc Tuan High School, Ha Noi

Experimental schools	**Class**	**Total number of student**		**Test Score (%)**			
				Distinction	**Good**	**Average**	**Weak**
Tran Quoc Tuan High School	Exper.	40		52,5	40,0	7,5	0,0
	Contr.	40		17,5	47,5	30,0	5,0

Table 3.8. Rate of test scores after 3 experimental lessons in Khoai Chau High School

Experimental schools	**Class**	**Total number of student**	**Test Score (%)**			
			Distinction	**Good**	**Average**	**Weak**
Khoai Chau High School, Hung Yen Province	Exper.	44	52,2	34,0	13,8	0,0
	Contr.	45	11,1	64,4	20,0	4,5

Table 3.10. Rate of test scores after 3 experimental lessons in Viet Bac High School, Lang Son

Experimental schools	Class	Total number of student	Test Score (%)			
			Distinction	Good	Average	Weak
Viet Bac High School - Lang Son Province	Exper.	42	47,6	42,8	9,6	0,0
	Contr.	42	14,2	52,3	28,5	5,0

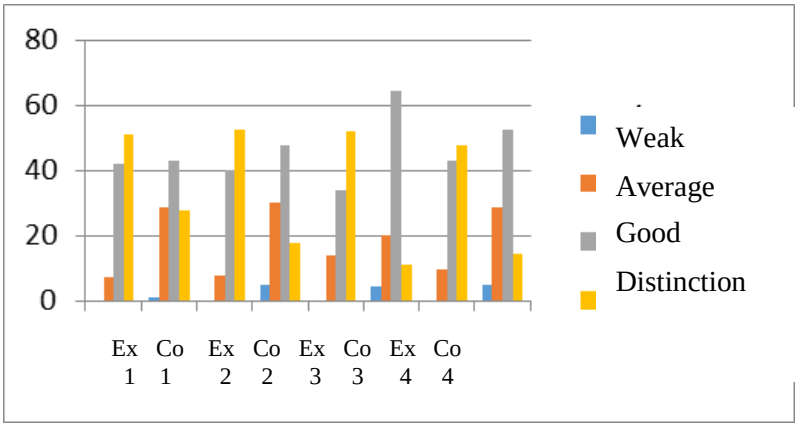

Figure 3.5. Comparison of results between Experimental (Ex.) and Control (Co.) classes in 4 schools.

Table 3.13. Summary of test scores after 3 experimental lesson in 4 schools

Experimental schools	Class	Total number of student	Test Score (%)			
			Distinction	Good	Average	Weak
Total 4 schools	Exper.	169	50,3	39,6	9,5	0,6
	Contr.	169	16,5	52,0	26,6	4,9

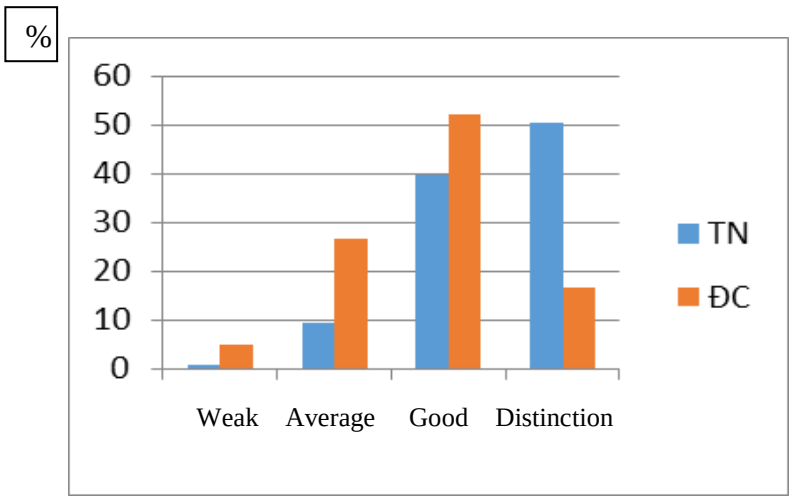

Figure 3.6. Demonstration of experimental results in 4 high schools

Table 3.14. Testing parameters of experimental results at 4 high schools

Class	Min	Max	Average	Mode	Standard deviation
Ex.	5,0	10,0	8,2	9,0	0,84
Co.	4,0	10,0	7,0	7,0	1,04

- Analysis of statistical values in table 3.2; 3.3; 3.12; 3.13; 3.14 shows the differences between the experimental class and control class on students' awareness, attitude and learning results. In the experimental class, the students were more interested in interactive learning (90.0%) than in the control group (46.2%). The learning quality of the experimental class is better than that of the control group, the mean score ($\overline{X}$) of the experimental class is (8.2) higher than the control class (7.0) of which students in experimental class gain the good and distinction score accounted for (89.9%) higher than the control group (68.5%), the students gain the average scores in the experimental class (9.5%) lower than the control group (26.6%) and no student in below average.

The statistical values in Table 3.13 show the differences between experimental class and control class. The difference is in the minimum point of the experiment (experimental class is 5.0, the control class is 4.0), the average score of experimental class by 8.2 and control class by 7.0, the score of experimental class was 9.0, while the control class was 7.0. The difference in grade (standard deviation) of the experimental class was 0.84 lower than the control class of 1.04.

- The thesis author used the independent T-test to find out whether the difference in mean of the two experimental and control class occurred randomly or not. Value P = 0.031 < 0.05, so the P value is significant (the difference is not likely to occur randomly).

To evaluate the effect of interactive teaching on the learning results of the experimental class compared to be practical or meaningful or not, the author uses the formula:

$$\textbf{SMD} = \frac{\text{Average value}_{\text{Ex. group}} - \text{Average value}_{\text{Co. group}}}{\text{Standard deviation}_{\text{Co. group}}} = \frac{8{,}2 - 7{,}0}{1{,}04} = 1{,}15$$

The value of SMD = 1.15, the effect is very large.

3.4.4. General comments on experimental results

3.4.4.1. Qualitative comments

Through the experimental process, the interactive teaching in Grade-12 Geography at high schools, we found that in the experimental class they are very excited, actively participate in learning activities, they are acquainted to, understand and implement the learning process in an interactive, proactive, active learning model (individual, group, whole class). The interaction between the teacher and learners, the learners - learners, the teacher - learners - environment takes place during the learning hours is very exciting and effective.

Teaching Geography by interactive teaching methods is very important, making the quality of learning of students increase significantly, specifically: the rate of distinctive students in experimental class is higher than the control class, the rate of average students is lower and no student is weak.

3.4.4.2. Quantitative comment

- Comparison between the results of the three experiments between the experimental class and the control class showed that the learning results between the two classes were different. Specifically:

- The Mode is the most frequently occurring value in a series of scores in the experimental class (9.0) while in the control class (7.0).

- Mean ($\overline{X}$) scores of the experimental class are always higher than those of the control class.

- The rate of students scoring good and distinction (from 7 to 10) of the experimental class is higher than that of the students in control class, and there is no rate of below-average students.

- Applying independent T-test in 3 experiments shows that the difference between the mean values of all class with coefficient $P < 0.05$ is significant.

- The standard deviation of the experimental class was always lower than the control.

- Effect standard (ES) indicates the magnitude of impact. The standard mean difference (SMD) of the three experiments against ***Cohen***'s criteria was very significant (> 1.00).

CONCLUSION AND RECOMMENDATIONS

1. Conclusion

Through the study of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy, the author of the thesis draws some conclusions:

1.1. Renovation of general education according to the orientation of capacity development is an indispensable objective trend for general education in our country. To renovate general education in order to promote the positiveness, activeness, creativeness and use of knowledge, skills, students' capacity development in learning, contribute to improving teaching quality at high schools.

1.2. Interactive pedagogy view is a modern teaching approach, focus on learners paying special attention to the interaction between three factors: the teacher, the learners and the environment. The diverse participation of the three factors is the source of dynamic relationships among them, the most characteristic of interactive pedagogy. As the leading role, the teacher can control the teaching process, the synchronous and mutual interaction to the learners and environment will bring high efficiency in the teaching process.

1.3. In order to organize the teaching of Geography in an interactive pedagogical viewpoint with high effectiveness, building an interactive learning environment plays a vital role in the teaching process. Teacher needs to use active teaching methods,

renew previous teaching methods, overcome one-way knowledge communication and train creative thinking of the learners, gradually apply modern advanced methods to the teaching process, guide the students towards the proactive learning, the learners may independently explore, collaborate, exchange, acquire and build knowledge then shapes their skills in different fields of life.

1.4. Achieved results and new contributions to the thesis:

- Clarifying the rationale for teaching in Grade-12 Geography at high schools from the view point of interactive pedagogy. The author has approached, clarified and applied the modern teaching opinion, methods and techniques in the world and in Vietnam in interactive teaching, contributed to affirm that interactive teaching may promote the learners' positiveness in teaching Geography in general and teaching Grade-12 Geography in particular at high schools.

- For the target as set out that studying the processes and methods of teaching Grade-12 Geography at high schools from the viewpoint of interactive pedagogy. The author has identified the requirements and principles for effectively organizing interactive teaching activities to promote the positiveness, activeness, creativeness for the students in learning, contribute to the method innovation and improve the teaching quality for Geography in high schools. Study the role of interactive teaching in Geography teaching along with the psychological characteristics and learning ability of Grade-12 students. On such basis, selecting the appropriate teaching methods and techniques to enhance interaction in classroom to make the class more lively, the students are more excited, more active, willing to seek out new ideas and explore the reality to share with others. The thesis has asserted that interactive teaching promotes the of learners' positiveness, activeness and creativeness in learning, promotes the effectiveness of interaction relationship between the learners, the teacher and the environment during teaching process of Grade-12 Geography in high schools.

- The subject has applied a number of methods and techniques into teaching in Grade-12 Geography at high schools from the viewpoint of interactive pedagogy in an effective way. Of which, identifying concepts, building up process, strong points and attention as using interactive pedagogical methods and the active approach to teach Grade-12 Geography as required by each part of lesson, when motivating, when getting to know new knowledge or when reviewing for the test. The subject has also applied information technology in the design of some teaching lessons in the direction of interactive teaching to achieve high efficiency.

1.5. Carrying out experimental teaching in some high schools to compare and test the hypothesis of the subject. Experimental results have verified the high effectiveness and feasibility of the research topic. Quantitative and qualitative assessment results showing in the tables (Table 3.2 to Table 3.14) prove that teaching of Grade-12 Geography from the viewpoint of pedagogical interaction has positively impacted the learning spirit, attitude and outcomes, developed students' capacity,

contributed to the innovation of teaching methods and improved the quality of teaching in high schools.

2. Some recommendations and proposal

2.1. For the Ministry of Education and Training and Department of Education and Training

Regularly organize training courses on renewal of programs, textbooks, teaching and testing methods and assessment of students' learning outcomes in the orientation of capacity developing to raise their professional levels and qualifications for teachers at high schools. This will enable the teachers to effectively apply interactive teaching strategies, methods and techniques to the practice of teaching Geography at high schools, to meet the demand for innovative education in the new period.

2.2. For the high schools

In order to organize interactive teaching with high effectiveness, teachers should regularly use interactive methods and techniques, the schools should strive to create a favorable learning environment such as investment, additionally providing modern facilities and equipments for teaching Geography, reference materials, specialized room for subject for the teaching, create the best conditions for teaching and learning, create a positive learning environment, promote the interaction relationships between students with students, students - teacher and between students - teacher - environment in an effective way, contribute to improve the teaching quality of Geography in high schools.

2.3. For teachers

Deeply aware of the innovation of general education in the direction of developing the capacity and quality of learners. To step up the renovation of teaching, testing and evaluating methods; to enhance the application of information technology and communication in teaching Geography in high schools. Each teacher needs to increase cooperation with other teachers to exchange and learn from each other in the professional team activities. To enhance self-learning and self-improvement to raise the professional qualifications and skills to meet the requirements of renewing general education in the new period.

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