MINISTRY OF EDUCATION AND TRAINING

HA NOI NATIONAL UNIVERSITY OF EDUCATION

LE VAN NHUONG

CONSTRUCTION AND USING THE EARTH SCIENCE E-TEXTBOOK IN TEACHING GEOGRAPHY TEACHERS AT CAN THO UNIVERSITY

Speciality: **Diactic and Methodology teaching of Geography**

Code: **9.14.01.11**

SUMMARY OF DOCTORAL THESIS IN EDUCATION

Ha Noi – 2018

This thesis is pubished at Faculty of Geography Hanoi National University Eduaction

Advisors: Associate Professor, Ph.D Nguyen Trong Phuc
Ph.D Dao Ngoc Canh

Reviewer 1: **Assoc. Professor, Ph.D Nguyen Phuong Lien**
Thai Nguyen University of Education

Reviewer 2: **Assoc. Professor, Ph.D Pham Quang Tuan**
VNU University of Science, Hanoi

Reviewer 3: Assoc. Professor, Ph.D Ngo Thi Hai Yen
Hanoi National University of Education

The thesis will be presented at the Thesis Council of the Hanoi National University of Education

In return :..... h ..... day ... ... month ... ... in 2016

You can find to read this thesis in Library of Hanoi National University Eduaction or National Library of Vietnam

INTRODUCTION

1. THE REASON FOR CHOOSING THE THESIS TITLE

In the age of information explosion, the mandatory requirement for higher education is must resolve the fundamental contradiction between increasing knowledge and learning needs of student learning and the time spent on classroom lectures spent. With that new requirement, traditional teaching and learning methods are hard to come by. Many innovative solutions have been proposed by educators in which e-Textbook is considered as a means and a tool to innovate teaching methods in context of Vietnam. The e-Textbook is enhanced in statistics, images, video, sound and etc, so it can effectively support the diversification of teaching organization and teaching methods at the university. Specifically, e-Textbook is capable of response the requirements of Teaching in the direction of competencies.

Teacher Geography Pedagogy in Can Tho Universiy and the Mekong Delta sense of self-study is still not high. They are weak in skills such as groupwork, presentation, use of ICT, etc. In the face of this situation, most teachers think that each module should design a e-Textbook, diversification of teachig organization and teaching methods with e-textbook.

In training Geo-Teachers program of the Can Tho university and others of Mekong Delta, the Earth knowledge is quite extensive, requiring students to have self-study time and the lecture of teacher must be highly visual. In fact, many teachers in the Mekong Delta still use the paper lecture to teaching. Therefore, the construction and use of Earth Science e-Textbook, in which the emphasis on statictis, maps, images, 3D models, video and audio.

According to above reasons, I chosen the thesis: *Construction and using the earth science e-textbook in teaching geography teachers at Can tho university.*

2. THE RESEARCH TARGETS AND TASKS

2.1. The target of research

This research was conducted to establish the Earth Science E-textbook adapt to the requirements of Blended Learning (face-to-face and online) and to teach in the direction of competency development. And the Earth Science E-textbook was used to organize the implementation of integrated classroom and online teaching methods to enhance cognitive competency and develop the necessary competency in Earth Sciences subject teaching to students of Geography, Can Tho University; This has contributed to the renovation and enhancement of the quality and effectiveness of the training of geography teachers in Can Tho University in particular and in the Mekong Delta region in general.

2.2. The tasks of research

- Study the theoretical and practical basis for the construction and use of e-Textbook in the capacity-oriented teaching.

- Define the objectives, content, requirements, principles and procedures for the compilation of the Earth Sciences e-Textbook for teaching geography.

- Contruction the Earth Science e-Textbook to teaching in Can Tho Universiy and the universities of Mekong Delta.

- Propose methods of using the Earth Science e-Textbook in teaching organization for geography teachers in the universities of the Mekong Delta.

- Organize experimental pedagogy to evaluate the feasibility of this thesis.

3. THE OBJECTS AND SCOPE OF RESEARCH

3.1. The objects of research

The objects of this study is content of the Earth Sciences e-Textbook, constructing process and using methods of this e-Textbook in the teaching of geography teachers in Can Tho university and other universities of the Mekong Delta.

3.2. The scope of research

- ***Content:*** This thesis focuses on the theoretical and practical basis of the construction of Earth Science e-Textbook (content of the Earth) in training geography teachers in Mekong Delta; Construction process and how to use Earth Science e-Textbook in teaching Geography Pedagogy students in the universities of the Mekong Delta.

- ***Object and scope of the survey, investigation:*** Geography Lecturers and tudents of Geography Pedagogical of Can Tho University, Dong Thap University and An Giang University.

- ***Object of experimental pedagogy:*** students of Geography Pedagogical study Earth science module in year 2014 to 2015 and 2015 to 2016 of Can Tho University.

- ***Time:*** Organization studies, investigations, experimental pedagogy from year 2014 to 2016.

4. OVERVIEW RESEARCH ISSUE

4.1. Research on e-Textbooks

Study on definitions, characteristics, roles and development trends of e-Textbooks and e-Textbooks in teaching in particular.

4.2. Research on e-textbook

Around the world, research into e-textbook for education is a long process. It begins with the development of definitions to the right perception and appreciation of the role of e-textbook in education; Finally, we have established appropriate guidelines for the development of e-textbook for education that can be integrated with LMS to create teaching courseware. In Vietnam, there are few studies on theories of e-textbook. When referring to the theoretical basis for e-textbook, most educators point to their views but do not provide a specific definition of e-Textbook. Research on e-textbook in Vietnam is mainly applied research.

4.3. Overview of the construction and use of the Earth Science e-textbook in Geography teaching

There are two types of research in the world and in Vietnam: research full of part of Earth Sciences and research each of part of Earth Sciences.

5. THE HYPOTHESIS OF THIS THESIS

If constructing the Earth Science E-Textbook based on the proposed requirements, and using this e-textbook in accordance with the proposed teaching methods will enhance the cognitive competency and specific competency in the Earth Sciences subject leanrning for students of Geography Pedagogy, Can Tho University.

6. THE VIEWPOINTS AND RESEARCH METHODS

6.1. The viewpoints research

The viewpoints used in this thesis include: Structure and system viewpoint, Learner-Centered teaching viewpoint, capacity-oriented teaching viewpoint, teaching technology viewpoint and practical viewpoint.

6.2. Methodology

The research methods used in this thesis include: Survey method, Method of analysis and synthesis of documents, System analysis method, classification method, investigation method, expert method, experimental pedagogy method and statistics method.

7. THE CONTRIBUTIONS OF THE THESIS

7.1. In theory

- This research has developed and supplemented the theoretical foundations of E-tsextbook.

- To set objectives, contents, principles and requirements for the construction and use of E-textbook in the earth sciences teaching.

- Proposing the process of constructing and using the E-textbook method in accordance with the objective of training geography teachers in the orientation of innovation in education of Vietnam.

7.2. In practicality

- The thesis has evaluated the current situation of using E-textbook in teaching in general and teaching geography in particular at Can Tho University.

- Contruct Earth Science e-textbook teaching in Can Tho Universiy and the universities of the Mekong Delta.

- Design of Earth Sciences courses in a collaborative way to develop competencies that fit the goals of the module.

- Verify the effectiveness of the Earth Science e-textbook in teaching capacity-based instruction through pedagogy.

8. THE STRUCTURE OF THE THESIS

The main text consists of three chapters:

- *Chapter 1:* Theoretical and practical basis for the compilation and use of Earth Science e-textbooks in teaching Geography teachers at Can Tho university.

- *Chapter 2:* Construct and Use of Earth Sciences e-textbook in Teaching for Geography Pedagogy Students.

- *Chapter 3.* Pedagogic experiment.

Chapter 1. THEORETICAL AND PRACTICAL BASIS FOR THE CONTRUCTION AND USING THE EARTH SCIENCE E-TEXTBOOK IN TEACHING GEOGRAPHY TEACHERS AT CAN THO UNIVERSITY

1.1. Innovation-oriented education and training in Vietnam

1.1.1. Renewing general education program in direct of competency development

Resolution No. 29-NQ / TW has defined the education of our country as *innovate fundamentally and comprehensively*. In its action plan MoET identifies *"promote renovate teaching methods in the direction of developing personal capacity of learners.* ".

1.1.2. Teacher students training in direction of competency development

Teacher training must be aimed at the training of creative people, self learning and lifelong learning. Geography teachers not only learn how to teach but also learn how to learn. The learning and training activities in the university environment of students must always be associated with real life.

1.1.3. Enhance the application of IT and communication in teaching

Resolution No.29, the Government's action plan and MoET's action plan define the task of promoting the application of ICT in teaching and learning. Instruction No. 2699 / CT-BGDDT also assert that in teaching at university level, it is necessary to *"combine traditional learning methods with blended learning to facilitate many learners and improve their skill*

quality adapt to labor market in the context of international integration and the industrial revolution 4.0 ".

1.2. Electronic textbook

1.2.1. The definition of electronic textbooks

There are many concepts of "electronic textbook", but most agree: *electronic textbook is an electronic form of teaching materials created based on the combination of knowledge content with images, Audio, video, 3D model, ... by the computer software.*

1.2.2. Advantages and disadvantages electronic textbooks in teaching

It increases interpersonal and tool interactions, individuality and autonomy of each learner, creates a private learning environment, learns wherever and whenever, and so on.

1.2.3. The role of electronic textbooks

- The e-Textbook allows learners to have more choices about learning materials.

- The e-Textbook curriculum enhances the ability to interact and guide learners.

- The e-Textbook is a modern teaching tool, effective for Blended learning.

- The e-Textbook is a very effective test and evaluation tool, especially objective test.

1.2.4. Requirements for the form and content of an e-textbooks

- Formality: must ensure the requirements of colors, maps, images, scripts, interactive exercises, ...

- Content: must be at least as detailed as the printed textbook. It also needs to meet the special requirements for *e-textbooks*.

1.2.5. Classification of electronic textbooks

There are many ways to classify e-textbooks. Tn terms of their interoperability, the e-textbooks are divided into three levels.

1.3. Combine E-textbook learning with Learning Management System (LMS)

1.3.1. Definition of Learning management system

1.3.2. Function of an LMS

1.3.3.. MOODLE and DOKEOS learning management systems

The author uses DOKEOS to organize teaching to Geography Pedagogy students for a number of reasons: DOKEOS is the official LMS used throughout Can Tho University; Students can easily use the account provided by the them to register courses without registering for a new account; DOKEOS is also fully functional as MOODLE or other LMS but it differs in that it allows embedding a wide variety of objective tests from different software. DOKEOS allows for the creation of a variety of highly interactive and objective quiz modes; Most students are used to working with DOKEOS tools in other modules.

1.4. Learning adapt to student's competency development

1.4.1. Concept of Competency

From the concepts of Québec-Ministere de l'Education, OECD and Nguyen Cong Khanh, it is possible to understand the ability to apply the knowledge, experience, skills and excitement to succeed or resolution of problems in life. It means learning to know and do, not just know and understand.

1.4.2. Structure of competency

According to the OECD, the overall structure of the competency action is described as a combination of four component competencies: technical competency, methodology competency, social competency and personal competency. It is corresponding to the four pillars UNESCO's educational philosophy.

1.4.3. Teaching methods oriented to develop learner competency

Teaching methods oriented to develop learner competency is not only on the positive thinking of students, but also on the problem-solving capacity associated with real life situations and occupations, enhance learning in groups, ...

1.4.4. Assessment development competence of learner

Assess competency is the assessment of knowledge, skills and attitudes in a meaningful context and in accordance with the output requirements of the educational process.

1.5. Blended Learning

1.5.1. Concept of Blended Learning

According to Victoria L. Tinio, Bonk C.J. And Graham C.R, D. Randy Garrison, Judy Thompson, Combined Teaching, is a concept that combines learning patterns between traditional classroom and online learning solutions.

1.5.2. Blended Learning Levels

In terms of the integration of functional components, Integrated Teaching Approach to Comprehensive Capacity Approaches has three levels of integration.

1.5.3. Levels of integration in teaching

In terms of the combination of functional elements, Blended learning in a holistic approach has three levels of integration.

1.5.4. The process of organizing Blended learning

Blended learning process consists of 5 steps: i) planning to combine the learning activities of your course, followed by ii) designing and developing integrated instructional elements The iii) Implement the designed activities; iv) reviewing (evaluating) the effectiveness of designed combined learning activities; and finally v) improvement and planning for the next course.

1.6. The Psychology and Cognitive ability of the Geography Pedagogy Students in the Mekong Delta

Geography Pedagogical students in the Mekong Delta have a passion for the profession they have chosen. The natural preference and character of the region makes some students have low self-awareness, which makes their self-study capacity very limited. Geography Pedagogical students in Can Tho Universiy and the Mekong Delta are weakness in language, hesitation, less brainstorming,...

1.7. Position, objective, content of Earth Science module in the Bachelor of Geography Curriculum

1.7.1. Location of Earth Sciences module

Under the MoET's Curriculum Framework, the Earth knowledge block is located in the Basic Geography 1 (including basic knowledge of the Earth and the lithosphere) in the amount of 4 credits.

1.7.2. Objectives of the Earth Sciences module

The goal of the Earth Science module is to provide an outlet for the module, which is geared towards the goals of knowledge, skills, attitudes and competencies that need to be developed.

1.7.3. Content of the Earth Sciences module

The Earth Science module consists of four chapters, including three chapters that provide background knowledge of the Universe and Earth and one chapter that organized teaching Earth Sciences at the high school. From the objective and content of the Earth Sciences module, the author concludes on the need to compilation Earth Science e-textbook.

1.8. The situation of training geography teachers in universities of the Mekong Delta

1.8.1. The situation of training Bachelor of Geography Pedagogy

Currently, the Mekong Delta has three majors in Geography Pedagogy: Can Tho University, Dong Thap University and An Giang University. Only Can Tho University is able to maintain its regular number of students. The other universities have suspended admission since 2014.

1.8.2. The situation of teaching and learning the modules in the Bachelor of Geography Curriculum in the universities of the Mekong Delta

Result of survey show that teacher is still teaching heavy on theory, enumerating knowledge and students are very passive in the teaching hours; ICT application is limited to the use of PowerPoint presentations. For students, most students do not know how to plan the learning to meet the requirements of the module. Students think that they need visual elements such as pictures, 3d models, video clips, etc. for the course. Students need e-learning resources to help them learn anytime, anywhere.

1.8.3. Status of teaching facilities for students of Geography Pedagogy at Can Tho University

The technical infrastructure and facilities of Can Tho University can apdat to the needs of teaching, learning and scientific research of the training disciplines as well as the develoment of disciplines, including Geography Eduaction.

Chapter 2. CONSTRUCTION AND USING THE EARTH SCIENCES E-TEXTBOOK IN TEACHING FOR GEOGRAPHICAL PEDAGOGY STUDENTS

2.1. Objectives, principles and requirements in the compilation of Earth Science electronic textbooks

2.1.1. Objectives for the construction and use of Earth Science e-textbooks

- Improve the teaching effectiveness of Earth Sciences module for students of geography education at universities of the Mekong Delta.

- Satisfying the objectives of innovating teaching and assessment methods towards the development of learner competencies.

- Develop the necessary competencies for Geography Pedagogy students.

- Apply ICT in geography teaching.

2.1.2. Principles for the construction and use of Earth Science e-textbook

The Earth Science electronic curriculum is designed to ensure science, pedagogy, interoperability, and aesthetics of inheritance.

2.1.3. Requirements in the construction and use of Earth Science e-textbook

Earth Science must meet the requirements of time, amount of knowledge, fit for purpose, form and reference material.

2.1.4. Criteria for building Earth Science e-learning curriculum for Geography teacher training

Earth Science e-textbook is built to meet the criteria of form and content synthesized and proposed in the thesis.

2.2. Contruct Earth Science e-textbook

2.2.1. E-textbook contruction process

The process of constructing electronic textbooks is conducted in 5 steps: Planning; Documentary collection; Selecting tools and presenting e-textbook content; Assess and update the e-textbook.

2.2.2. Contruct Earth Science e-textbook

2.2.2.1. Identifying the audience and learning needs

The author identifies some of the basic characteristics of the student serving the curriculum development, such as the amount and duration of course registration, the level of knowledge gained, the level of proficiency of the skill, attitudes, needs and expectations of the learner..

2.2.2.2. Contruct Planning

Based on the goals and syllabus of the Bachelor of Geography Curriculum, the author divides the Earth Science e-textbook into 15 sections, each with one or two topics. Students study 2 hours in class or LMS and 4 hours self study. During the scripting process, the author identifies new points for additional knowledge, images, maps, videos, multiple choice questions, study guides and self study, glossary search, search term,...

2.2.2.3. Collect Document

After planning, the author collects the necessary materials for the construction of the Earth Science e-textbook. The information, data, charts, maps, movies,... must be selected from the source of high reliability.

2.*2.2.4. Choose the tool to contruct and present e-textbook*

a. Choose the tool

The tool to contruct e-textbook consists of two groups: content design (mainly web design software) and content construction support (image processing, video processing, video ...).

b. Present e-textbook

** Design and layout interface for e-textbook*

- Process and present the top banner, banner and index

To create the banner as shown in Figure 2.1, the steps are as follows:

+ Step 1: Create a textbox in MS. PowerPoint 2007,

+ Step 2: Process by Edit / Paste and paste textboxes in Photoshop.

+ Step 3: Copy and Paste the image and delete unnecessary parts.

+ Step 4: Save the image file by File / Save as.

Figure 2.1. The main banner of the Earth Science e-textbook

Other banners are similarly processed, just resizing images, deleting and inserting matching objects.

- Design and layout of the pages

+ Open new page in Antenna, use File / site.theme command;

+ Insert the processed banner into site.theme.

+ Create borderline limits for content.

+ Create text for banner content.

+ Create links to chapters content.

** Design and present lesson contents (week)*

Within the content of the thesis, the author only shows the design steps and the contents of the lesson "The shape and size of the Earth" (chapter 2).

*** Step 1:** Designing the "Study Guide at Week 4":

The steps are as follows:

- Use common interface has designed and inserted text, images to complete the content.

- Insert text: Use the Objects / Textbox command.

- Insert images: use the Objects / Picture command.

Contents of the "Study Guide at Week 4" contain with folder tree of chapter 2:

Figure 2.3. Presentation of Self-Study Guide at Week 4

Step 2: Design and layout of content pages:

- Page "2.1.1.1. "Ellipsoid Form," "Geoid Form," "Size," "Meaning of Earth Shape and Size": Follow the same steps as the "Guide at Week 4" page.

** Content Design and Content Page "Review Chapter 2":* This page contains 10 self-learning suggestions (made using word processing commands) and 20 interactive questions created by HotPotatoes software.

- Step 1: Open HotPotatoes 6.0 software, select "Jquiz".

- Step 2: Enter the subject, the content of the question, the answer and Feedback

- Step 3: Save the multiple-choice questions as web forms.

- Step 4: Link the multiple choice questions page to the corresponding section of chapter 3, execute the command/Properties.

** Use DOKEOS to supply information and design online teaching activities for Earth Science e-textbook.*

- Develope content of "Course Description": Briefly present information

such as curriculum name, credit amount, duration, summary of contents, name of lecturer, reference materials, PPDH And evaluation test.

- Integrate Earth Science e-textbook with DOKEOS: After completing the content, Earth Science e-textbook will be packaged in *zip format with Winrar software and uploaded to DOKEOS "Documentation".

- Online Student Management: Students will be managed in two forms as individuals (by class list) using the "Users" tool and grouping with the "Group" tool on DOKEOS.

- Develop discussion topics, discussion on "Forum" tools: The author uses the "Forum" tool to build discussion topics, students will post ideas or questions that need to exchange.

- Build online quiz exercises using the "Exercises" tool: DOKEOS allows the creation of multiple types of direct multiple choice questions on the system and self-reflection questions using the "Exercises" tool.

- Manage students' assignments, assignments using the "student essay" tool. For ease of management, we created for each group a space on DOKEOS to load their products up.

2.2.2.5. Review and update e-textbook

Review and update information, images,... for e-textbook after use.

2.3. Use Earth Science e-textbook in Blended learning

2.3.1. Sign up for an account and access ebooks on DOKEOS

To use "Earth Sciences" e-textbook via LMS system, users should proceed to register under the following process:

- Step 1 - Register account: on http://lms.ctu.edu.vn or visit www.ctu.edu.vn/.

- Step 2 - Register for the course: After registering for the course, students enter the course "Course Management" / "Register for courses".

- Step 3 - Access Earth Sciences ebooks on DOKEOS

After enrolling in the Earth Science course, students will access the "personal sciences" section / select "Earth Sciences" / access the "Documentation" tool to view the content of e-mail. DOKEOS system.

- Step 4 - Use e-textbook on the DOKES:

+ Editing Toolkit: Allows the teacher to compile necessary content for teaching, including content of e-textbook.

+ Interactive toolkit: Allows teachers and students to engage in interactive activities in the online learning process.

+ Management tools: Use the blogs management of students, provide course information, course statistics and course preservation.

2.3.2. Organized blended learning Earth science e-textbook

2.3.2.1. Problem-Based Learning

a. The process of teaching Earth Science e-textbook by Problem-Based Learning. This method is done in 5 steps.

b. Using Problem-Based Learning method in teaching the topic *International Time and Change day Line*

*** Step 1:** Choosen the problem. The teacher analyzes the reasons for choosing the problem for the students in the class.

*** Step 2:** Name the problem and transfer the student to a problematic situation

- The teacher raised the issue: One day during the journey of Ferdinand Magellan.

- Guide students to online activities

*** Step 3:** Find solutions to the problem.

*** Step 4:** Conclusion.

After the members have come up with their solution, the teacher will conclude How to calculate the time, the change of time when passing the international date in the journey of the Magellan.

*** Step 5:** Apply new knowledge to solve the next task. Students will use their knowledge to do some timed exercises.

c. Using Problem-Based Learning method in teaching the topic *Plate tectonics* by visual aids *(include 5 steps like topic International Time and Change day Line but using visual aids to support organizing learning activities)*

2.3.2.2. Group working methods

a. The process of teaching Earth science e-textbooks by the methodology of group work. The process of organizing group work is done in 5 steps.

b. Using the group work in teaching the topic *Solar System Origins*

*** Step 1:** Choose the discussion topic and design the assessment tool

- Select the topic of discussion: Give reasons for choosing this topic

- Design of assessment tools: Use of observation sheets 3 and 4.

*** Step 2:** Divide group and assign tasks to groups.

- Divide the class: In the classroom, teachers divide the class into 4 groups.

- Task assignment: Students need to log into the DOKOES system, find "Group", to join the group activity space.

*** Step 3:** Follow up and support online discussion. Teachers monitor the activities of the groups to answer questions or provide necessary support.

*** Step 4:** Present the results of the discussion. The product of the groups is a PowerPoint presentation and this report is presented directly in the classroom.

*** Step 5:** Review and assessment. Students use the scorecards: 4, 4.1-HMT, 4.2-HTM and 4.3-HTM.

c. Using the group work in teaching the topic The Planets in the Solar System by visual aids *(include 5 steps like topic Solar System Origins but using visual aids to support organizing learning activities)*

2.3.2.3. Project-Based Learning

a. Process of implementing the project in teaching Science of Earth e-textbook. The process of organizing this method is done in 4 steps.

b. Implementing the project "Assessing impacts of tides on production and living of people in Can Tho City"

*** Step 1:** Select a topic

- Define topic: In class, teacher analyzes the reason for choosing this topic.

- Objectives of the project: Knowledge, skills, attitudes and competencies.

*** Step 2:** Design a project plan.

- Design a Project: The teacher carries out the project design and integrates it into Earth Science e-textbook.

- Divide and Assign: Students are divided into 4 groups (4 to 5 members each) with specific tasks for each group.

*** Step 3:** Carry out the project.

- Collect information: The groups will have 2 weeks to collect information including the content of the argument and the performance of the questionnaires.

- Process Information: The groups will discuss directly for classification, analysis, selection and sorting in accordance with the content of the report.

- Complete the product: Student products to be achieved through the project include: Word report, PowerPoint presentation and presentations.

*** Step 4:** Introduce the product. Student presents their products on DOKEOS and in class.

*** Step 5**: Conclusion. Teachers will give each group a self-assessment and peer evaluation through evaluation form.

2.3.3. Self-study method with Earth Science e-textbook

2.2.3.1. The process of organizing students' self-study with Earth Science e-textbook. The self-study process of students is conducted through 4 steps as the application.

2.3.3.2. Using the self-study method in studying the topic *Earth Shape*

*** Step 1:** Define tasks and design assessment tools.

- Define the task: Individual students self read Earth Science and Technology and summarize the content of the lesson by thinking diagram or by their creativity, and conduct online exchanges.

- Assessment tool design: Teacher uses the number 1 to evaluate the self-study process and the number 2 to evaluate students self-study.

*** Step 2:** Self-study and complete the product. SV will read section 2.1.1. The shape of the Earth Sciences e-textbook and the contents in references, self-design plans to complete the product within the allowed time frame.

*** Step 3:** Presentation. In addition to the product that is a summary in the class shared through the "Share a document", students must present their product in class.

*** Step 4:** Review and evaluation. Students self-knowledge to learn through lessons. The results of the assessment are published in DOKEOS Forum.

CHAPTER 3. PEDAGOGY EXPERIMENT

3.1. The purpose and tasks pedagogical experiment

3.1.1. Pedagogical experiment purposes

Organization of pedagogical experiments to test the hypothesis of the thesis: If constructing the Earth Science E-Textbook based on the proposed requirements, and using this e-textbook in accordance with the proposed teaching methods will enhance the cognitive competency and specific competency in the Earth Sciences subject leanrning for students of Geography Pedagogy, Can Tho University.

3.1.2. Pedagogical experiment tasks

Experimental tasks are defined as: Identification of experimental objects; Select the appropriate experimental content; Compilation an experimental

plan; Implement experimental activities; collection statictis and assessment; Analyze the results of the experiment, conclusion.

3.2. Principles of experimental pedagogy

Experimental process must ensure the following principles: objectivity, scientific and practicality.

3.3. Experimental pedagogy objects

- The surveyed objects on quality of E-Textbook is 209 students and 30 teachers in 3 universities includes Can Tho, Dong Thap and An Giang.

- Participants in experimental pedagogy use the Earth Scienes in the study are selected according to the following principles: number; Input capacity (through the results of the entrance exam and the results of the first semester); Learning conditions; teacher. Experimental objects are shown in the table below:

Table 3.1. Number of experimental object.

Experimental time	Control students		Experimental students	
	Group unit	number	Group unit	number
1st	SG317002 (year 2014-2015)	40	SG317001 (year 2014-2015)	39
2nd	SG317002 (year 2015-2016)	44	SG317001 (year 2015-2016)	46
Total		**84**		**85**

3.4. Content and methods of experimental pedagogy

3.4.1. Content of pedagogical experiment

The content of the pedagogical experiment is the entire content of the Earth Science e-textbook and paper lecture.

3.4.2. Method of pedagogical experiment

The subject of the exercise was two experimental methods includes:

* Survey by questionaire on the quality of the Earth Sciences E-textbook.

* Experimental using the Earth Sciences E-textbook:

- Experimental control to assess students' cognitive abilities.

- Experimental post-impact assessments aim at assessing common and specific capabilities that need to be developed for students in the Earth Science module.

3.4.3. Construction methods and evaluation criteria

* The method of assessing the opinion on the quality of the Earth Sciences E-textbook is based on the selection rate (k) in the criteria to be processed according to the survey questionnaire.

* Assessment of cognitive abilities is calculated by the formula: $Đ_{HP} = Đ_{QT} + Đ_{CK.}$ Among them:

$Đ_{H:}$ is the summation of the module; $Đ_{QT}$ is the process point (50% of the total); $Đ_C$ is the end point (50% of the total).

* Evaluation of competencies to be developed by the formula: $\overline{X} = \frac{1}{n}\sum_{i=1}^{n} n_i X_i$

Among them: *n is the total number of experimental samples,* n_i *is the i th sample,* X_i *is the score of the ith experimental sample.*

3.5. Organize pedagogical experiment

* Survey by questionaire on the quality of the Earth Sciences E-textbook is done in the first semester of years 2015 - 2016. The questionaire is sent by Google Drive link, CD and directly.

*** The 1st pedagogical experiment:** Teaching the experimental group and the control group at the same time from 30/12/2013 to 13/4/2014.

*** The 2nd pedagogical experiment:** Experimental and control groups were taught at the same time from 28/12/2015 to 11/4/2016. Simultaneously, during this time, the capacity assessment forms for post-impact monitoring activities were also implemented.

3.6. Analyze the experimental pedagogy results

3.6.1. Surveys of teachers and students about the Earth Science e-textbook

Results of the survey of 209 students and 30 lecturers at 3 Can Tho University, Dong Thap University and An Giang University showed that:

- On the form of the Earth Science e-textbook: all are rated at upwards, with an average of about 30% rated good and over 50% rated good.

- About the content of the Earth Science e-textbook: all evaluated at the upward level, in which the average is over 25% rated at good level and over 60% rated at good level.

- About the E-textbook learning support effectiveness Earth Science module: Mostly, e-textbook Earth Sciences support very well for improving self-learning skills, computer skills, Online, ... of the teacher of Geography.

3.6.2. Experimental using the Earth Sciences E-textbook

3.6.2.1. Control experimental pedagogy

a. First experimental pedagogy

Table 3.2. Course summary in the first control pedagogy experiment

Point	**Control students**		**Experimental students**	
	Nurber	**Ratio (%)**	**Nurber**	**Ratio (%)**
Under 4 (F)	0	0.0	0	0.0
4 – 4.9 (D)	8	20.5	0	0.0
5 – 5.4 (D+)	3	7.7	4	10.0
5.5 – 6.4 (C)	9	23.1	2	5.0
6.5 – 6.9 (C+)	4	10.3	11	27.5
7 – 7.9 (B)	7	17.9	15	37.5
8 – 8.9 (B+)	8	20.5	7	17.5
9 – 10 (A)	0	0.0	1	2.5
Total	39	100.0	40	100.0
Average	**6.249**		**7.148**	

Table 3.2 shows that the mean of the experimental group is greater than that of the control group, the mean and the coefficient of variation are small, indicating low dispersion. The Independent-Samples T Test results showed Sig. = 0.024 <0.05 and Sig (2-tailed) = 0.02 <0.05 should conclude (according to the original hypothesis) that the mean of the experimental and control groups was significantly different with a 95% confidence interval.

b. The 2nd experimental pedagogy

The comparison was similar to that of the first group, with the mean score of group (7,411) higher than that of control group (6,661), standard deviation and standard deviation is small. The results showed that Variance Sig. = 0.038 <0.05 and the significance level of two-sided observation was less than 0.05. Therefore, the mean scores of the control group and the control group were significantly different with the reliability of 95% .

Through two experiments, the results showed that Blended Learning with Earth science e-textbook was more effective than traditional teaching through the printed lecture.

3.6.2.2. Experimental pedagogy assessment after impact

a. The results of 1st experimental pedagogy

The change of capacity indices is shown below:

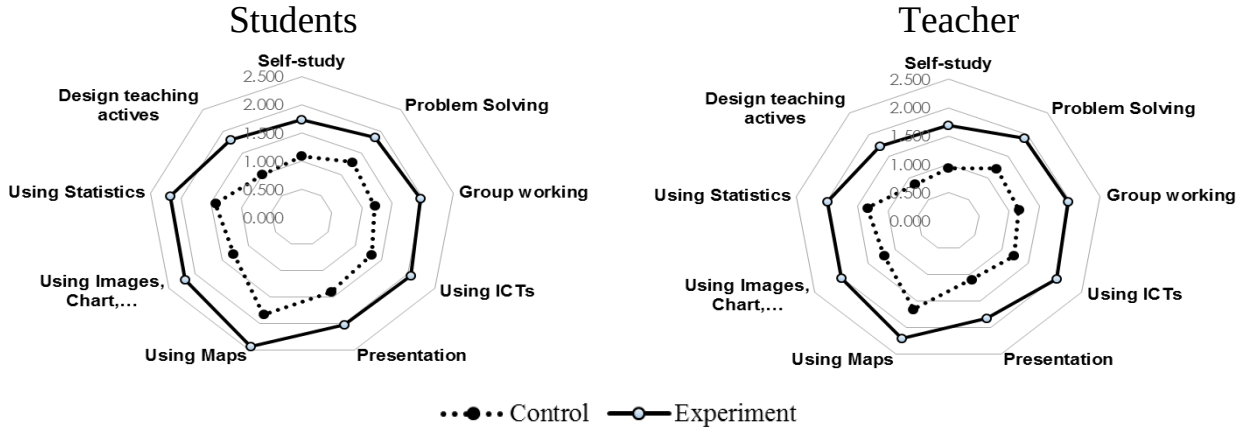

Figure 3.1. The chart shows the average change in the performance index in the post-impact assessment

The results show Sig. 2-tailed scores of all competencies in the results of teacher and teacher evaluations were less than 0.05, indicating that the difference in average level of the experimental and control groups was significant 95% confidence.

b. The results of 2nd experimental pedagogy

The change of capacity indices is shown below:

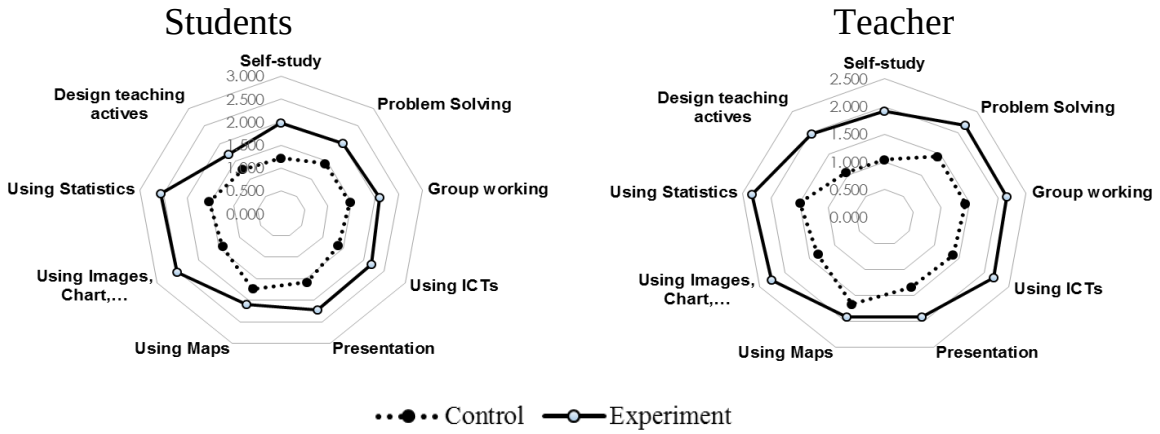

Figure 3.1. The chart shows the average change in the performance index in the post-impact assessment

The results show Sig. 2-tailed scores of all competencies in the results of teacher and teacher evaluations were less than 0.05, indicating that the difference in average level of the experimental and control groups was significant 95% confidence.

In addition to the quantitative assessments, we also survey the opinions of the experimental group students in both experiments on the effectiveness and desirability of them with the Earth Science e-textbook.

CONCLUSIONS AND RECOMMENDATIONS

1. CONCLUSIONS

Through the research process, we make some conclusions as follows:

- The topic has taken the view of teaching and learning technology according to the capacity as the main viewpoint, and applied the method of research in accordance with each stage such as collecting and processing information, experts, Experimental pedagogy, ...

- The thesis has overeview the current status of e-textbook and Earth Science e-textbook research in the world and in Vietnam.

- The thesis has developed the theory of e-textbooks, and analyzes the practical basis for proposing the process of compilation an e-textbook suitable for the goal of teaching oriented towards capacity development.

- The author has developed the Earth Science E-textbook adapt to the requirements on content, form and ability to support teaching organization.

- The thesis has used the Blended learning methods such as Self-study, Problem Based-Learning, group work, Project Based-Learning and Using visual aids in developing cognitive ability, self-study ability, ability to use information technology,...

- Through the experimental pedagogical process, it can be concluded that the Earth Science e-textbook is both a aid and a tool very suitable to organize blended learning, contributing to improve teaching quality for geography pedagogy students in the Mekong Delta.

2. RECOMMENDATIONS

2.1. For the management organiztion

MoET and universities should have incentive policies and concrete measures to enhance the construction and use e-textbook in teaching at the university level, especially in the modules requiring high visibility.

2.2. For teachers

- The first, teachers must be improving their competency to apply ICT in teaching so that they can better exploit the world's science and technology achievements in professional teaching and career development for students.

- Each subject should have the appropriate options and apply other teaching methods when using e-textbook.

- Each teacher needs to develop a set of tools for assessing the student's competency to suit the course objectives, psychological characteristics, cognitive characteristics of the students and the practical conditions at their places of work.

- In order to use e-textbooks effectively, the design process should focus on exploring the students' desire to learn new things before providing information sources; At the same time, in the process e-textbook, teachers need to pay attention to maximize the positive activities of students.

- Although the use e-textbook in teaching and learning has brought positive results, it is necessary to pay more attention to the training of students, especially the skills of presentations, analysis of maps, charts, ...

2.3. For students

It is necessary to maximize the positive, active, creative and self-learning ability to achieve high results in the process of learning with the common teaching methodology.

LIST OF RELATED SCIENCE PUBLICTIONS

SCIENTIFIC ARTICLE

1. Le Van Nhuong (2012), "*Construction and use of electronic records (E-Portfolio) for teaching Geography 11 - High School"*, Ho Chi Minh University Journal of Science. (ISSN 1859-3100), No. 36 (70) in 2012, pp121 - 130.

2. Le Van Nhuong, Pham Hong Mo (2014), *"Compilation and using geographic 10 - high school terminology lookup software"*, National Conference on Geography VIII (2014), Tr973 - 978.

3. Trinh Duy Oanh, Le Van Nhuong (2015), "*Building a set of tools for assessing students according to their abilities in teaching geography 10 - high school"*, Saigon University Journal of Science (ISSN: 1859 - 3208).), No. 3 (28) May 2015, pp59 - tr68.

4. Le Van Nhuong (2015), "*Current situation, solutions for building and using electronic textbooks towards capacity development for students of Geography Pedagogy - Can Tho University"*, Ho Chi Minh University Journal of Science, . (ISSN: 1859-3100), No. 9 (75) by 2015, tr131 - 140.

5. Le Van Nhuong (2016), "*Courseware Design Towards Self-Learning Capacity Development (Case Study in Can Tho University")*, National Conference on Geography IX (2016), pp. 1176-1183.

SCIENCE RESEARCH TOPIC

6. Trinh Duy Oanh, Le Van Nhuong (2015), *Renewal of pupils' assessments according to their capacity in teaching geography 10 - high school, university research subjects - University of Saigon*, code CS2014-67 (Acceptance in June 2015, Excellent).

7. Le Van Nhuong (2015) (Chair), *Copetency Development for Teachers' Students in Training Based on Credit System*, Scientific Research Projects at Can Tho University, code T2014-76 4/2015, Excellence).