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USING MIND MAPS IN TEACHING GEOGRAPHY IN LOWER SECONDARY SCHOOLS

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Abstract

The current trend of innovation in Vietnamese education is to change from content-oriented teaching to capacity-oriented teaching for students. This requires teachers to use visual teaching methods to help learners get interested in learning, helping them form subject-specific knowledge and competencies. Mind maps have a combination of graphic information such as images, colours, and symbols that are used as a visual teaching tool. Using mixed research methods including literature analysis, pedagogical observations, and empirical surveys, this article first focuses on the definition and role of mind maps in teaching. Next, the author introduces popular software and steps to design a mind map. Finally, we propose measures to use mind maps in teaching 6th grade Geography.

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SỬ DỤNG SƠ ĐỒ TƯ DUY TRONG DẠY HỌC ĐỊA LÍ Ở TRƯỜNG TRUNG HỌC CƠ SỞ

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Từ khóa

Sơ đồ tư duy, dạy học Địa lí, lớp 6

Tóm tắt

Xu hướng đổi mới trong giáo dục Việt Nam hiện nay là chuyển từ dạy học định hướng nội dung sang dạy học định hướng phát triển năng lực và phẩm chất cho học sinh. Điều này đòi hỏi giáo viên phải sử dụng các phương pháp giảng dạy trực quan để giúp người học có hứng thú với việc học, giúp họ hình thành các kiến thức, năng lực đặc thù của môn học. Sơ đồ tư duy có sự kết hợp của các thông tin đồ họa như hình ảnh, màu sắc và biểu tượng được sử dụng như một công cụ giảng dạy trực quan. Bằng việc sử dụng các phương pháp nghiên cứu hỗn hợp bao gồm phân tích tài liệu, quan sát sư phạm và khảo sát thực nghiệm, bài báo này trước hết tập trung vào định nghĩa và vai trò của bản đồ tư duy trong giảng dạy. Tiếp theo, tác giả giới thiệu một số phần mềm phổ biến và các bước thiết kế sơ đồ tư duy. Cuối cùng, bài viết đề xuất các biện pháp sử dụng sơ đồ tư duy trong dạy học Địa lý lớp 6.

1. Introduction

The General Education Program (2018) focuses on developing the qualities and competencies of students from primary to upper secondary level [1]. This requires the selection and use of appropriate teaching methods and techniques to develop students' qualities and competencies in each subject. Therefore, the use of modern teaching technologies in education is an inevitable trend and determines the effectiveness of education [2]–[4]. Teaching Geography based on technology has had positive effects and has been studied by many authors [5]–[7]. In the practice of teaching Geography in high schools today, it is shown that the inclusion in the lecture of symbols, images, diagrams, charts, and graphic elements ... will help students remember knowledge longer, and more firmly. Teaching Geography at the lower secondary level plays an important role in the formation and development of key qualities, general competencies, and specific competencies for students [4]. The application of information technology, especially the use of mind maps in teaching Geography, demonstrates the innovation of teaching methods and contributes to improving the efficiency of educational activities.

There are many studies in the world on the use of mind maps in teaching. In the early 1970s, mind mapping was developed by Tony Buzan as a tool to help people remember effectively [5]. Yeong (2013)

argues that mind maps are a useful learning tool, students must learn how to use them and then build their mind maps [6]. Yu (2017) applied mind maps to teacher teaching and student learning, helping students build knowledge systems, practice rigorous logical thinking abilities, and improve learning efficiency [7]. In addition to traditional mind maps, digital mind maps are becoming increasingly popular as pedagogical visual aids that make lessons fun and easy to use [8], [9]. This topic has also been studied by the following authors: Hidayati (2020); Syahputri & Murdiono (2022); Rosba (2023); and Riska et al. (2023). Through research results around the world, it has been confirmed that using mind maps in teaching is the right direction and brings many benefits.

In Vietnam, there are many research results on the use of mind maps in teaching activities. For example, authors Trinh Thi Huong and Lu Hung Minh (2019) argue that mind mapping is an effective tool that helps transmit information into the human brain and bring it out [10]. Kieu Thanh Thao (2022) identified the use of mind maps that can visualize knowledge, make a strong impression, and build a coherent thinking circuit between parts and ideas in the lesson [11]. Related to the use of mind maps in teaching geography, we can mention the research results of Nguyen Thi Thu Anh (2012); Nguyen Phuong Lien and Pham Huong Giang (2018); Nguyen Thi Hue and Hoang Thi Thanh Giang (2021). The above studies have concretized the research problem at different levels.

Based on the results of international and domestic research on mind mapping, in this article, we address the use of mind maps in teaching in lower secondary schools with the following research experiences: 1/ Learn the concept and role of mind mapping; 2/ Introduce some mind map design software; 3/ Suggest measures to use mind maps in teaching 6th grade Geography.

2. Research approach and methods

2.1. Approach

- Access domestic and foreign documents to clarify theoretical issues, and research directions using mind maps in education.

- Practical approach to see the current state of teaching and using mind maps in teaching Geography today. Thereby, there is a basis for analyzing and evaluating the role of mind maps in teaching results.

2.2. Research methods

In this article, we apply mixed research methods including literature analysis; pedagogical observation; empirical surveys, and then evaluation of educational effectiveness.

3. Research results and discussion

3.1. Overview of Mind map

According to Budd (2004), a mind map is a sketch in which major categories radiate from a central image and smaller categories are depicted as branches of larger branches [12]. Mind mapping, developed by Tony Buzan as an app capable of exploring the brain's thoughts on a topic from different perspectives and activating the right and left brain lobes together as an alternative to linear thinking. [13]. According to Liu et al. (2018), mind mapping is an effective mapping tool, that can be used to create, visualize, structure, categorize ideas, solve problems, etc. [14]. Mind mapping is a brainstorming technique that allows users to decipher complex topics by creating a graphical representation of constituent subtopics and related topics [15].

In Vietnam, there are also several studies presenting views on mind maps, specifically: Nguyen Thi Nhi (2016) said that mind maps are a form of non-linear recording in the form of extended charts; Use colors, lines, and images to express, develop, or deepen an idea. Mind maps reflect the thinking processes that take place inside the human mind, and have the effect of systematizing knowledge contents, promoting memorization, and promoting creative potential [16]. A mind map is a form of note-taking that uses keywords, digits, colours, and images to expand and deepen ideas [17]. According to Le Thi Thu Huong and Vongphet Onsyma (2019), a mind map is a form of recording to explore, deepen, expand an idea, and systematize a topic or a knowledge circuit,... by combining the simultaneous use of images, lines, colours, and writing with positive thinking [18]. In our opinion, mind mapping is a method of recording, storing, and arranging information in a graphical pattern following the structure, activity, and function of the human brain. Mind maps contain keywords, images, colours, and symbols to represent ideas, tasks, and goals related to a word or main idea.

The use of mind maps in education has an important role to play in improving teaching and learning, the use of visual tools for learning is becoming increasingly popular [19]. Erdem (2017) suggests that mind maps have benefits such as memorization, enhanced creativity, problem solving, focusing on a

topic, and organizing thoughts. Mind maps today have an important place as a tool for lifelong learning as constructivist methods are used as a foundation in the teaching process [13]. According to Nguyen Thi Thu Anh (2012), using mind maps helps students easily systematize the knowledge of a lesson, a chapter, or the entire curriculum [20]. The construction and use of mind maps will support students to learn on their own and know how to systematize knowledge easily. At the same time, the use of colors and images, combined with some mind mapping software will help students remember more easily and create more interest in learning [21]. According to Trinh Quynh Dong Nghi (2023), combining mind maps with other active teaching methods will contribute to improving the quality of education, helping students actively and have better thinking. The technique of using mind mapping is an activity method that helps teachers implement and control the entire teaching process effectively, stimulating the multi-senses of learners to participate in the acquisition and production of communicative language [22]. Thus, it can be affirmed that mind maps play an important role in teaching. Mind maps help teachers focus on what needs to be discussed for students and encourage students to discuss and think independently. Mind maps are ideal tools for teaching and presenting concepts in education.

3.2. Guide to building a mind map

3.2.1. Draw a mind map by hand

- Prepare tools: Use a blank sheet of paper and a brush. You can also prepare crayons if you want a richer and more vivid mind map.

Identify the topic: Write the name of the main topic in the centre of the paper, such as "Motion of the Earth". Draw a small circle around the main keyword.

- Draw big ideas: Look for important ideas from the main topic. Draw a branching line that comes from the theme in the centre connected to each idea, such as "Self-rotation around the axis" and "Rotation around the Sun".

- Diagram Development: From each major idea, draw further branch lines to sub-ideas that complement that idea. Continue to expand the detailed ramifications for sub-ideas.

- Complete the diagram: After completing the content and images expressing the idea of the main topic, it is necessary to add colours and illustrations to easily understand and remember knowledge.

3.2.2. Design mind maps with software

- Blumind: Simple mind mapping software with an easy-to-use interface.

- Canva: Easy-to-use mind mapping software, completely online and free.

- Concept Draw Mindmap: The software can design and build mind maps quickly, scientifically, and effectively.

- Edraw Mind Map: Free, easy-to-use mind mapping software and support for large, multi-page diagrams.

- Freeplane: Mind mapping software offers a simple and intuitive interface. The software provides many function buttons to help users create a variety of mind maps to suit their needs. In addition, users can change the background colour of the diagram or the way links are represented on the map.

- iMindMap: The smartest mind mapping software, helping to organize scientific work.

- MindArchitect: MindArchitect mind mapping software helps users create an impressive mind map with images, create hyperlinks...

- Mindjet MindManager: Mind mapping software specializing in arranging work content flexibly and creatively.

- Novamind: Mind mapping software that allows users to organize ideas as well as build plans systematically and effectively. NovaMind has a simple and intuitive interface with tools arranged so that it is easy to access. At the same time, this software also supports the use of theme themes, templates, and many styles to help create creative and unique mind maps.

- PowerPoint: Free online Mindmap drawing software.

- SimpleMind Desktop: The software helps you manage and organize the mind maps in a folder, and search maps by keyword or by paragraph. Data files after being created will be synchronized on devices using this software. Users can share mind maps in different file formats.

- TheBrain: The software has a library with rich images that meet all note requirements easily.

- Xmind: is a free mind mapping software with open source, users can easily share mind maps.

3.2.3. Steps to build a mind map

To improve the effectiveness of applying mind maps in teaching Geography in lower Secondary School, it should be based on the following five basic steps:

Step 1. Determine the gist of the mind map. First, it is necessary to identify the main idea or topic on which the mind map will focus.

Step 2. Add the appropriate branches. From the main idea, add the appropriate branches. Each branch will represent a related idea or concept.

Step 3. Use keywords for branches. On each branch, use keywords to describe the idea or concept that the branch represents.

Step 4. Choose the right colour. Use colour to distinguish between branches and make diagrams more vivid.

Step 5. Incorporate the use of illustrations. Illustrations can make it easier to understand and remember information.

3.3. Using Mind maps in teaching 6th grade Geography

3.3.1. Features of the 6th grade Geography Curriculum

At the lower secondary level, based on the psychology of students' ages and subject characteristics, Geography is developed logically: from general natural geography (grade 6) to continental geography (grade 7), then to natural geography of Vietnam (grade 8) and socio-economic geography of Vietnam (grade 9). In teaching geography, the process of formulating a basic concept is usually going from a symbol of geography to a concept of geography. The formation of geographical symbols is even more important for 6th graders; Ensure that students can easily memorize symbols and concepts, connecting concepts with real life. The system of channels, text channels, and questions is very rich, creating conditions for students to exploit, deepen knowledge, self-study, and practice subject skills. Geography in grade 6 aims to form and develop students' geographical ability based on basic, selective knowledge of General Natural Geography; the relationship between humans and the natural environment; help students know how to use the tools of Geography science to learn and apply practice; At the same time, contributing to other subjects and educational activities to form and develop in students the main qualities, especially the love of the motherland, the country, the pride of national traditions. From the above characteristics, it can be affirmed that the Geography program at the lower secondary level is very favourable for the use of mind maps in teaching.

3.3.2. Guide teachers and students to use mind maps

** For teachers*

- Use of mind maps in teaching new knowledge: The content of the Geography section of the 6th grade Geography textbook program includes knowledge of general natural geography; basic knowledge of cartography, Earth science and man's relationship with nature [8], [27]. Use mind maps in the teaching process to train students in learning skills and memorize knowledge effectively. Based on the content of each lesson, teachers develop teaching activities using mind maps, organizing individual or group activities, detecting and solving problems... Using mind maps helps students acquire skills in reading and understanding documents, processing, analyzing, and synthesizing information. In addition, the exploitation of mind maps contributes to the formation of listening skills, taking outline notes and presenting lessons simply and fully. In "Chapter 2. Earth - Planet of the Solar System" the teacher builds a mind map of the Earth's motions. The correct keyword selection, colour design, attractive fonts and visual images help students quickly memorize and clearly distinguish the characteristics and consequences of 2 movements of the Earth: Self-rotation around the axis and rotation around the Sun (see **Figure 1**).

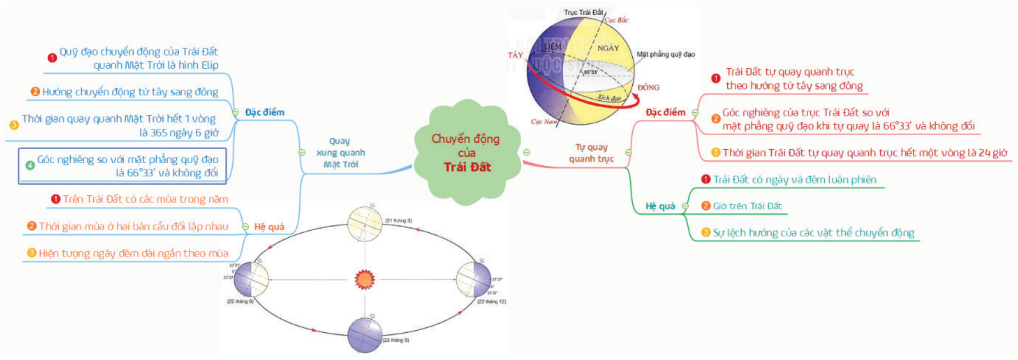

Figure 1. Mind maps illustrating lesson 7-8 in "Chapter 2. Earth - Planet of the Solar System"

- *Use mind maps in knowledge consolidation and review*: With practice and review lessons, teachers use lectures with graphic elements such as colours, and images, combined with mind maps to help students know how to systematize knowledge, know how to self-study effectively and have more interest in learning.

- *Use mind maps in testing*: Teachers check students' old lessons during the opening of lessons, so teachers can ask students to recreate part of the lesson content that has been learned by drawing simple mind maps on the board. Example: Before moving on to teaching the content of chapter 6 "Soil and organisms on Earth", to check the old paper of chapter 5 "Water on Earth" (Geography 6), the teacher asks a student to draw and fill in information for the main branch which is the main components of the hydrosphere and the secondary branch which is information about the characteristics of the river, lakes, groundwater, glaciers, seas and oceans on a blank mind map. Completing the information for the above mind map is not too difficult a requirement, but if students do not study, they will not be able to draw and fill in or will fill in incorrectly.

* *For students*

Based on observational practice, the article outlines four benefits of mind mapping for students:

1/ Increase learning efficiency: Mind maps help students recognize and understand the structure of a topic. It helps students absorb information in the most general and accurate way.

2/ Stimulating creativity: Mind maps create conditions for students to brainstorm and create, thereby stimulating knowledge discovery.

3/ Improve memory ability: Mind maps are considered the "optimal memory tool", helping students system a large amount of information simply and remember knowledge longer.

4/ Technology application ability: With online mind mapping software, students can easily create a beautiful and accurate mind map design.

Here are four common ways teachers guide students to use mind maps.

- *Study teacher-provided mind maps:* Students use pre-drawn mind maps in the process of teaching new knowledge or to summarize lessons. Students are asked by the teacher to restate the entire content of the lesson. Students present the mind map presentation sequence as follows: Present the important content of the lesson located in the centre of the mind map then present the ideas developed based on images and keywords according to the branching diagram in the direction originating from the centre moving outward clockwise. In the process of students presenting, teachers lead, suggest, and encourage students to complete the presentation of the entire mind map.

- *Fill in the missing mind map:* The teacher provides students with frame mind maps (with branches) but has not filled in the information (keywords, images...). The teacher builds suggestive questions, orients students to answer, and finds the right information to fill out the mind map. Students work from home or in class, do individual activities, or have group discussions. Students complete the missing mind map by using short phrases to fill in the missing information and insert associations for the mind map, then present to the whole class the content of the mind map.

- *Build some branches of mind maps on their own:* Students are tasked by teachers to discuss to identify the main branches of the topic in groups, and groups are tasked with designing the content of the main branches. Groups work for a certain period, after which the teacher asks the groups to present their products, groups with the same content comment, and add. After the discussion groups, the teacher comments on each group and then gives a complete mind map of the topic to be reviewed.

- *Build an entire mind map on the topic of practice and revision:* This is the highest level teachers ask students to do. Students are tasked by the teacher to draw a complete mind map to summarize the lesson by drawing on paper or using software installed on a computer. For competent students, teachers encourage students to use online mind mapping tools such as Coggle.it, auth.ayoa.com, meister.co, text2mindmap...

The solutions listed above will help students gradually improve the level of use of mind maps in the self-learning process. Students acquire long-term learning and self-study methods and form a positive, creative learning attitude. In addition, mind maps help students practice teamwork, presentation and problem-solving skills. In "Chapter 3. The structure of the Earth. Earth's crust" students build their mind maps on "Volcanoes and earthquakes using Edraw Mind Map software (see **Figure 2**).

Figure 2. Mind map illustrating the content of "Volcanoes and earthquakes"

We compared the results of the tests and observed the learning attitudes of students in classes that used mind maps with those of students who did not use mind maps in practice. The results show that the quality and attitude of learning of experimental class students is better.

4. Conclusion

In education, mind maps can be used to support teaching new knowledge, consolidating knowledge after each lesson, reviewing and systematizing knowledge and testing and evaluation. In practice, mind maps are used as a visual teaching tool to help teachers improve one-way teaching to switch to active, creative teaching. Combining mind maps with other modern teaching methods will be a new direction, bringing great effects to teaching in general and teaching Geography in particular in schools.

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