

DESIGNING AND USING DIGITAL MUSEUMS TO ORGANIZE EXPERIENTIAL ACTIVITIES FOR STUDENTS IN TEACHING HISTORY AT HIGH SCHOOLS IN VIETNAM

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Abstract: *In the digital revolution 4.0, the designing and using of digital museums in teaching in general and teaching History in particular in high schools is a necessary requirement, contributing to the realization of educational functions of the museum for the younger generation. The new feature of the General Education Curriculum for History in 2018 was the formation and development of students' qualities and capacities, and focused on practical content and historical experience. Therefore, using a digital museum to organize experiential activities for students is of vital importance in realizing the objectives of the subject program. This article aims to clarify the concept, role, and meaning of a digital museum, then propose a design process and measures to effectively use a digital museum in organizing experiential activities for students. The experimental pedagogical results confirm the advantages and effectiveness of the proposed measures, contributing to the quality improvement of History education at high schools.*

Keywords: *design, digital museum, experiential activities, teaching History, high Schools*

1. INTRODUCTION

In modern times, digitalization and automation technologies have impacted almost every field, profoundly changing our country's socio-economic development. Along with this development, the issue of applying information technology (here after *IT*) in designing and using digital museums for social life in general and educational activities, in particular, is increasingly being paid much attention.

The construction of digital museums is slower in Vietnam than in other neighbouring countries and in the world. The first digitalized museums in the UK, Brazil, China, Turkey, and more were built in the middle of the 19th and early 20th centuries. Meanwhile, in Vietnam, the first one had just been built by the National Historical Museum in 2013. Many museums in Vietnam, such as the National Museum of History and the Vietnam Fine Arts Museum, have already built 3D museums to promote cultural heritage to the public in the home country and overseas. Originally, however, museums were digitized mainly for exhibitions, storing, preserving, promoting, and attracting

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visitors. Meanwhile, the orientation of using digital museums to support teachers and students in History teaching and learning at high schools is considerably limited. Therefore, applying IT in designing and using digital museums to help teachers and students at high schools learn about their national history in a more intuitive, scientific, and attractive way is a new direction in Vietnam.

One of the new features of the General Education Curriculum (GEC, 2018) in History is that the knowledge content was built systematically on topics and is highlighted the importance of historical practice, connecting history with real life. Therefore, using a digital museum to organize experiential activities in teaching History is one of the practical and effective measures to develop students' competencies and qualities and meet the objectives of the subject program.

2. RESEARCH CONTENTS

2.1. Digital museum in teaching History

Building digital museums has become an inevitable development trend of modern museums. In the digital era of 4.0, digitalized museums are being researched and applied more and more. Therefore, scholarship has presented many different views on the concept of digital museums.

In China, a country with many museums and historical relics, the studies on digital museums have witnessed many achievements very early. According to Yang Xiangming (2006, p. 93), *“A digital museum is the collection, management, display, and processing of all aspects of the museum's cultural relics in digital form, and can provide study information through the Internet”*.

In Vietnam, studies on clarifying the concept of digital museums appeared when many museums started to apply IT in their professional activities. According to Vu Tien Dung (2008, P. 44), *“The artifacts in the museum, according to the traditional concept, are original copies, so when being digitized, a simulated information copy will be stored in the computer's memory, thus bringing numerous benefits to the information storage”*.

Based on the above analysis, to ensure the suitability with the characteristics of teaching in high schools, in general, and teaching History, in particular, the author defines a digital museum as a system of documents and artifacts of the real museum converted into digitized data in various formats, such as text, image, audio, and video depending on specific pedagogical ideas to serve the teaching and learning of History with IT support. Thus, a digital museum does not merely perform the function of displaying and introducing artifacts. With pedagogical ideas associated with specific historical

knowledge, it offers teachers suggestions on how to teach and helps students learn History effectively.

2.2. The role and meaning of using digital museums in organizing experiential activities for students

Socrates, a Greek philosopher, once said that “*Education is not like filling a vessel, but it’s more like kindling a fire*” (Thomas Gordon, 2019, p. 9). This means the goal of education is not to focus on “filling in knowledge” but to build an education aiming at awakening the desire to learn and the potential of students. Designing and using a digital museum has an important role and meaning in organizing experiential activities in teaching History at high schools. Specifically:

Knowledge

First of all, digital museums play an important role in providing and supplementing historical knowledge for students. Usually, students mainly observe the artifacts and read the annotation information for each artifact when visiting a real museum. This amount of general knowledge is often too much and is difficult to memorize. However, with a digitized museum, teachers can select featured images and typical information about artifacts. Thanks to this, students can memorize the basic historical knowledge (time, character, place, end so on) more easily and conveniently. Besides, teachers can base the purpose of use to design a digital museum according to pedagogical ideas that are suitable for the content of each lesson or each subject topic. This can provide students an overview of the historical development process of history, thus knowing how to compare and relate knowledge in books with practical knowledge.

Competencies

An advantage of digital museums is the support of Information Technology. Teachers can exploit it to design a digital museum that integrates questions, exercises, games, etc., and even connects the content of exhibits of many different museums, helping students see and absorb historical knowledge from many aspects. The integration of knowledge and learning tasks in the digital museums contributes to the formation and development of students' general and specific competencies in the subject of History.

Qualities

Educating the young generation is always the primary concern of every country. Studying History with the help of a museum helps students get real historical feelings, foster passion, promote positivity and be active in their learning. The learning enjoyment contributes to educating students about *patriotic* qualities and pride in the nation's historical tradition; the spirit of *compassion*, gratitude and respect for differences between

different cultures. It also strengthens a sense of *responsibility* to preserve, protect and promote the historical and cultural values of the nation. Moreover, it trains students to be *hardworking* and eager to learn, actively apply information technology to serve academic study, have an *honest* attitude and look at history objectively and scientifically.

All in all, digital museums provide knowledge about not only historical traditions but also science, environment, cultural lifestyle, ethical behavior, personality qualities, ideology, political, emotional, and aesthetics for high school students.

2.3. The process of designing a digital museum to organize experiential activities for students in teaching History at high schools

To design a digital museum for effective History teaching, teachers can follow the design process as below.

Step 1: Defining the lesson objective(s)

This is the first and most important step of any process of designing. Based on the objectives of the lesson or the topic identified, the teacher can select the content of historical knowledge and artifacts of the museum, develop design ideas and use the appropriate digital museum.

Example: Based on the requirements to be met in the General Education Curriculum of History, the author determines the objectives of the topic *Vietnamese Traditional Art History* as follows:

About knowledge: Students are able to name typical achievements and analyze new points of art in the Ly, Tran, Later Le, Mac, Revival Le, and Nguyen dynasties.

About competencies:

- *Common competencies:* *Problem-solving skills and creativity* are shown when students perform practical tasks by creating learning products after visiting a digital museum. Students' *communication and cooperation skills* are developed through group activities to solve learning tasks. Finally, their *autonomy and self-learning abilities* are formed through actively exploring the digital museum to perform learning tasks.

- *Special abilities:* Students' *ability to learn history* is formed through exploiting documents and artifacts of the digital museum to describe the characteristics of traditional Vietnamese art from the 10th to the 19th centuries. Their *historical cognitive capacity and thinking* are shown by comparing new points in art through feudal dynasties. Finally, students' *ability to apply knowledge and skills* is through artistic knowledge to solve current real-life problems.

About qualities: The first quality is *patriotism* referring to raising students' awareness of preserving and promoting the traditional cultural and artistic values of the nation. The second quality is *hard-working* which means students' love, active exploration, and creativity in History lessons.

Step 2: Selecting materials and artifacts from the museum

Each museum stores a vast amount of documents and artifacts, but not all artifacts are suitable for the content of historical knowledge of the lesson. Therefore, teachers need to choose appropriate artifacts according to the goal of each topic.

Example: Through surveying the display content of the Vietnam Fine Arts Museum, we selected many typical and suitable artifacts to design a digital museum to organize experiential activities for students to learn about the topic *The History of the Vietnamese traditional art* as follows:

- Ly Dynasty: Bodhi tree leaf with dragon carving, round cutting board, column footing platform (Phat Tich Temple, Tien Son, Bac Ninh).
- Tran Dynasty: Relief “*Dragon carved door*”, wood carving “*Dragon looking at lotus*” (Thai Lac Temple, Vinh Phuc).
- Later Le and Mac Dynasties: Dragon sculpture drawing at the gate of Le Loi mausoleum (Thanh Hoa province), Kinh Thien Palace Steps (Imperial Citadel of Thang Long, Ha Noi); wood carving *Fairy riding a dragon* (Loc Du communal hall, Thuong Tin, Ha Noi).

These typical artifacts help students compare the dragon images through dynasties. Therefore, students can assess the impact of historical context on the development of national art.

Step 3: Digitizing documents and artifacts of the museum

With the current strong development of IT, teachers have many opportunities to utilize modern tools and software to support the teaching process in general and digitize museum materials and artifacts in particular. Each tool has its advantage in digitization and the choice of tool depends on the teacher's intention. Within the scope of the research topic, we choose to exploit the advantages of some simple but effective tools as follows: Canva, Padlet, Google Forms, Proprefs, Powtoon or Proshow Gold... In addition, teachers can refer to many applications that support free video and image editing, such as *Pixlr*, an online photo editing and design tool, *Video2edit*, a user-friendly tool to edit and convert video files, or *Canva*, a simple tool to edit photos and videos for handling photos or videos taken by themselves or found on museum websites.

Step 4: Building a digital museum

Digital museums with good design ideas will bring high efficiency. Therefore, ideas for designing, including the layout, arrangement of digitized artifacts and interactive activities with artifacts of the museum, are very important. Within the scope of the research topic, we choose to exploit the advantages of the ThingLink tool to design a digital museum because it is a simple but highly effective tool in design. For example, Image 2.1 below is the main interface of the digitized Vietnam Fine Arts Museum to teach the topic *The History of Vietnamese Traditional Art* (General Education Curriculum of History, 2018, History Grade 11).

The author has attached red interactive tags, so students only need to click on the tags to perform interactions with the artifacts, such as observing images, reading detailed descriptions of artifacts, watching documentaries, listening to narrations, accessing links to other museums, playing history games, answering multiple-choice questions, discussing on museum forums, enjoying relaxing music during the tour, and sending questions to the museum's "Suggestion Box", end so on. (Image 2.2)



Image 2.1: The main interface of the Vietnam Fine Arts Museum digitized by ThingLink

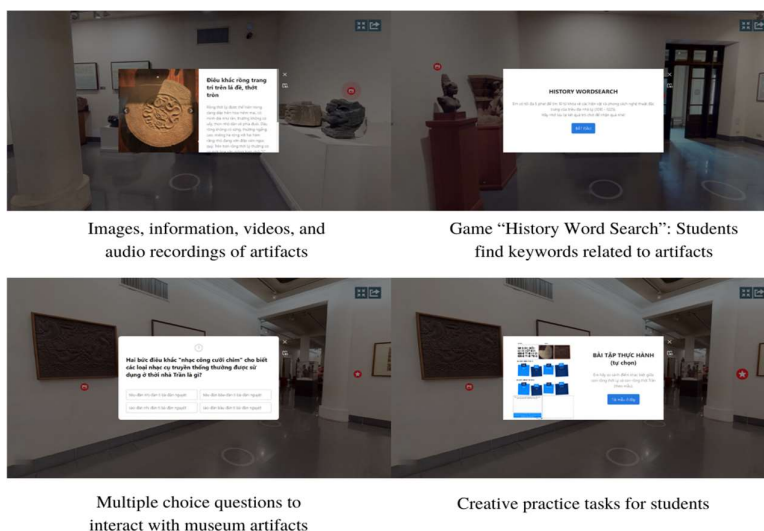


Image 2.2: Interactive activities for students on the digital museum

Teachers complete and share with students in the form of website links, QR codes or being embed in other browsers such as Google Classroom, Microsoft Teams, Facebook, Email, etc.

Step 5: Testing and evaluating

Completing the design is not the final stage. To have the most complete and effective design, teachers need to conduct experiments to test the effectiveness. The testing aims to help teachers assess the suitability of the content as well as the interactions of the digital museum with the student's ability to learn and practice. Teachers can design a survey questionnaire using Google Form, then tag the link right on the digital museum (Add tag) so that they can always receive the feedback of students during the process of exploring the museum. Besides, on ThingLink, teachers can click on the *Statistics* section to view the data of the students' interaction with the design (number of views, number of clicks, mouseover, time spent on each tag...). From the data received, teachers can analyze, evaluate, modify the design and deploy the application.

2.4. Some measures to use digital museums for organizing experiential activities for students in teaching History at high schools

In the General Education Curriculum in 2018, experiential activities are compulsory educational activities to help students approach reality, experience positive emotions, exploit their previous experiences and apply their knowledge and skills to solve real-life problems. In all subjects and in History at high schools, in particular, experiential activities are considered one of the teaching methods to help students gain historical experiences from real life, thus implementing the motto "*Learning with Practice*" effectively. Within the scope of the article, the author would like to introduce and propose some measures for teachers to use digital museums for effectively organizing experiential activities for students as below.

Firstly, teachers can organize a virtual tour. Example: Below are some activities teachers can organize for students to visit the Digital Museum of Vietnam Fine Arts in the classroom.

- Warm-up activities: Students can access the museum website and enjoy the song "*Vietnamese land hopes for a thousand years*". The purpose of this activity is to catch students' attention, get them ready for a virtual tour of the museum; especially, to arouse students' excitement and national pride through the song's heroic melody and message.

- Museum tour activities: Students take turns observing the digitized artifacts and they can actively select the options to learn about the artifacts that they find most

impressive. During the tour, each student can participate in interactive games and send at least one question to the mailbox of the Digital Vietnam Museum of Fine Arts.

- Museum Post-Visit activities: Teachers and students discuss together to answer the questions that the students have sent to the mailbox of the digital museum. Students work in groups with the topic: *"My feelings when visiting the Vietnam Fine Arts Museum (Hanoi)"*. In this case, students can choose to do the post-tour assignment in one of the forms such as poetry writing, article composing, rap composing, model making with recycled materials, picture drawing, and picture printing, end so on.

Secondly, teachers can organize a history contest. For example, the digitized Vietnam Fine Arts Museum, which was designed by the author, has many outstanding features that help increase students' ability to interact with artifacts. Specifically, in each displayed-artworks space of each period, there are multiple-choice questions and engaging online games, such as crosswords and keyword searches, related to the exhibits of that period. These practical tasks require students to use the historical information provided by the museum to complete creative products with their marks. For example, teachers can organize a contest titled "Talented Painters". Further details are described as follows.

- One round can be "Brilliant Art Ideas". For any work of art, artists must go through a period of searching for ideas and inspiration. Therefore, the teams can choose the marked artifacts and complete the challenge (games) on the digital museum. Each keyword in the game is a suggestion for the teams to form ideas for the drawing in the next round. The team to complete the challenge the fastest and with the best result wins.

- The other round can be "Be Creative". In this round, each team chooses one of three main materials provided by the Contest Organizing Committee to perform the task. Materials are selected from various options like leaves (the fallen leaves that remain intact), sand, gravel and plastic bags, tape, glue, scissor, etc. The tasks can be *"Suppose you were invited to design for the national costume contest of the Miss World pageant, what costume would you design for the representative of Vietnam to promote the traditional art of Dai Viet civilization to international friends?"* After that, a team member from each team presents their work on behalf of their team. The team with the most creative work that matches the requirements of the mission and delivers the most meaningful and humane message wins.

Thirdly, teachers can guide students to design their digital museum with an overview of the history content included in the General Program. At the end of each digital museum discovery activity, teachers should guide students to summarize the knowledge gained in the process. Thanks to this, historical knowledge is engraved in learner memory in a

logical and systematic way. When students have the opportunity to summarize the content of knowledge acquired, it is also an interesting and necessary way to experience learning.

Example: Specifically, below are some images extracted from the video of a student called D.H. Anh (class 11A15, Quoc Oai High School, Hanoi) who designed his miniature digital museum using the Canva tool.

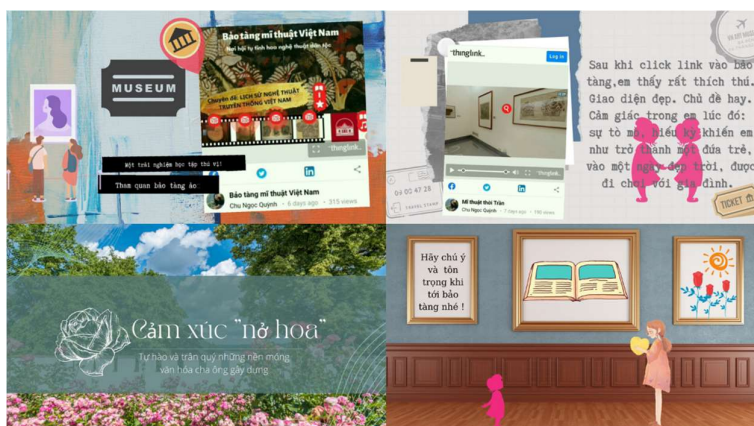


Image 2.3: A student used Canva to design his digital museum

To form a scientific basis for evaluating the feasibility, effectiveness as well as the impact of the design and use of a digital museum to organize experiential activities for students in History Teaching at high schools, we have carried out pedagogical experiments according to the proposed method. Specifically, we used the Digitized Vietnam Fine Arts Museum to organize a contest on the topic *History of Vietnamese traditional art* at Van Lang High School (Lang Son), Quoc Oai High School (Hanoi), Que Vo 1 High School (Bac Ninh), Luong Tai 1 High School (Bac Ninh) and Hien Da High School (Phu Tho). After processing and analyzing the survey data of 6 teachers and 332 students participating in the experiment, the results obtained are as follows.

First, let's review the results by summarising the comments of the experimental teachers and the visiting teachers. 100% of teachers' comments indicate that the digitized museum used in the experimental hours is consistent with the objectives and content of the subject topic, the measures to organize teaching, implementation capacity of teachers, students' ability to learn and practise, their learning attitude and facilities of the school. Although in the experimental process, teachers and students still faced certain difficulties such as students' limited skills in using information technology (accounting for 50% of teacher opinions), and unstable network connection (accounting for 16.7% of teacher comments). However, in general, teachers comment that the digital museum is easy to use and interact with so they only need to guide students on visiting it more frequently. In addition, with a roadmap, a digital museum will achieve the desired effectiveness.

Secondly, let's look at the level of students' interest in the design content of digital museums. The majority of students are interested (and very interested) in the design of the digital museum, accounting for more than 90%. However, regarding the museum interface (colors, tags...), a small percentage of students are not interested (accounting for 0.9%). This is also something we need to take into consideration when modifying to make the interaction of students with the museum tags more convenient and effective.

There are many subjective and objective factors that influence the above results, but the digital museums, in particular, have a considerable impact, really bring excitement to students in the History lesson. A student called DTD Duong (class 11A15, Quoc Oai High School, Hanoi) shared her feelings: *"I am extremely interested in experiencing the digital museum, and extremely excited because I have the chance to acquire more knowledge. The museum interface is very beautiful and lively... I hope that digital museums will be used more and more widely in all subjects because it is very useful and convenient"*.

Thirdly, let's discuss the degree of completion of the student learning products after each lesson. The students in experiment classes all completed the product seriously and demonstrated their meticulousness, ingenuity and creativity. This reveals that they all understand the task to be done, and especially, they can apply the information provided by the digital museum to perform the learning tasks.



Image 2.5: Some students' works

After the research process and based on the experimental results, the author would like to raise some discussion ideas as below.

Firstly, in the context of teaching and learning History at modern high schools, designing and using a digital museum to organize experiential activities is necessary and effective, and this practice receives positive feedback from teachers and students. The methods of organizing the experiential activities proposed by the author in the research not only promote the advantages of digital museums, but also contribute to the achievement of the subject's objectives, the formation and development of key

competencies for students in the digital age. As Francesca Albrezzi (2019, p. 227) emphasized in her research, “*allowing learners to make choices and create their own learning experiences is a strength*” of using digital museums for learning and research.

Secondly, only the application of the most modern means and software for designing a digital museum is not enough. In teaching in general and teaching History in particular, the choice of which software and technology tools to use for designing a digital museum is influenced by various factors such as the subject's objectives, appropriateness with the organizational capacity of the teachers, the practical capacity of the students and suitability with the practical conditions of the specific high school. In short, no matter how important, technology is only a tool to support teaching, the decisive factor for the success of designing a digital museum is to have an effective pedagogical idea. This conclusion is consistent with the opinion of author Wu Ming (2015, p. 92): “*The design of a digital museum should not consider technology as a guiding factor, but focus on the good interaction of visitors with artifacts during the tour*”. Therefore, if we misuse technology, become too dependent on it or only use it for the purpose of gathering, storing and describing documents and artifacts of a traditional museum, the digital museum has not yet been brought into full play.

3. CONCLUSION

The design and use of a digital museum to organize experiential activities in teaching History at high schools depend on many factors. Among them, teachers and students are the most decisive factors. The liberal thinking of teachers in applying teaching methods affects the creativity and positivity of learners, and vice versa, students' attitudes and learning abilities help teachers adjust and build appropriate teaching plans. There is no best method, but only better methods when used for the right purpose and suitable for learners. Therefore, the proposed measures for organizing experiential activities for students in this research are just some suggestions for teachers to use the digital museum effectively with the subject, and at the same time promote the advantages of multimedia and initiative in the artifact interactions of the digital museum. What method teachers choose depends on the goals, performance capacity, student competencies and facilities of each school and each different local area. It is important that students can assert themselves, promote creativity and nurture a passion for learning History in the process of using a digital museum.

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**THIẾT KẾ VÀ SỬ DỤNG BẢO TÀNG SỐ HÓA TỔ CHỨC HOẠT ĐỘNG
TRẢI NGHIỆM CHO HỌC SINH TRONG DẠY HỌC LỊCH SỬ Ở TRƯỜNG TRUNG
HỌC PHỔ THÔNG**

Chu Ngọc Quỳnh

Tóm tắt: Trong cuộc cách mạng công nghệ số 4.0, việc thiết kế và sử dụng bảo tàng số hóa trong dạy học nói chung và dạy học môn Lịch sử nói riêng ở trường phổ thông là yêu cầu cần thiết, góp phần thực hiện chức năng giáo dục của bảo tàng đối với thế hệ trẻ. Điểm mới của Chương trình Giáo dục phổ thông môn Lịch sử năm 2018 là hình thành và phát triển phẩm chất, năng lực cho HS và chú trọng nội dung thực hành, trải nghiệm lịch sử. Do đó, sử dụng bảo tàng số hóa tổ chức hoạt động trải nghiệm cho HS có ý nghĩa quan trọng trong việc thực hiện mục tiêu chương trình môn học. Bài viết tập trung làm rõ khái niệm, vai trò, ý nghĩa của bảo tàng số hóa, đề xuất quy trình thiết kế và biện pháp sử dụng bảo tàng số hóa tổ chức hoạt động trải nghiệm cho HS. Kết quả thực nghiệm sư phạm khẳng định ưu thế và hiệu quả các biện pháp đề xuất, góp phần nâng cao chất lượng giáo dục Lịch sử ở trường THPT.

Từ khóa: bảo tàng số hóa, hoạt động trải nghiệm, dạy học Lịch sử

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