

RESEARCH H5P APPLICATION TO BUILD INTERACTIVE LEARNINGS

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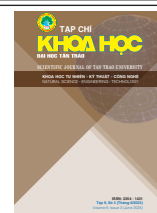
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Abstract:

The application of information technology in developing interactive lectures is an issue that has been studied extensively. Especially in online teaching, interactive lectures play an important role to encourage the activeness of learners and enhance student verification. In this paper, the author researches H5P tools, builds a process to design interactive lectures, and realizes them with 3 interactive lecture applications: Interactive video, interactive lectures and interactive simulation

Keywords:

H5P, Interactive,
Interactive video,
interactive lectures
interactive simulation



NGHIÊN CỨU ỨNG DỤNG H5P ĐỂ XÂY DỰNG BÀI GIẢNG TƯƠNG TÁC

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Thông tin bài viết	Tóm tắt
<p>Ngày nhận bài: 02/12/2022</p> <p>Ngày sửa bài: 20/02/2023</p> <p>Ngày duyệt đăng: 16/5/2023</p>	<p>Ứng dụng công nghệ thông tin trong xây dựng bài giảng tương tác đang là vấn đề đã và đang được nghiên cứu một cách sâu rộng. Đặc biệt trong dạy học trực tuyến bài giảng tương tác có vai trò quan trọng để khích lệ tính tích cực của người học và tăng cường kiểm chứng người học. Trong bài báo này tác giả nghiên cứu công cụ H5P, xây dựng quy trình thiết kế các bài giảng tương tác, hiện thực hóa bằng 3 ứng dụng bài giảng tương tác: Video tương tác, bài giảng tương tác và mô hình mô phỏng tương tác.</p>
<p>Từ khóa:</p> <p>H5P, tương tác, Video tương tác, Bài giảng tương tác, Mô phỏng tương tác.</p>	

1. Asking the problem

Interactive teaching [1,2,3] is being used by many teachers in their teaching process to improve teaching quality. Many information technology tools have been applied to build lectures to serve interactive teaching such as: video tutorials, electronic lectures, simulation models. One of the problems that always arises is how to make the lecture attract learners, increase the learners' self-discipline and active participation, and control learners when participating in learning.

From the actual teaching, especially online teaching, there are some problems that exist after using electronic lectures in teaching.

+ Learners when using self-study lectures (tutorial videos, electronic lectures, simulations) only turn on to see how many times they have participated in the class, but actually do not absorb the knowledge of the

lesson. The reason these lectures do not have the ability to interact backwards is to require learners to have knowledge to complete the lessons.

+ Because the lecture does not create interactive questions during the learning process, the learners feel bored and do not have to think much in the process of one-way passive acquisition.

To fix the above problems still exist. In this article, on the basis of researching the application of H5P tool, the author gives a process to design 3 types of interactive lectures that are widely applied in teaching today. Interactive videos, interactive electronic lectures, interactive simulation models. Apply to build interactive lectures.

2. Research content

2.1. H5P Tool

2.1.1. H5P is what

H5P is an acronym for HTML5 Bundle (HTML5 bundle). H5P is an open source toolkit that helps users compile a variety of interactive content for online courses, websites or personal blogs. Each interactive content is an HTML5 bundle that includes HTML, CSS, and Javascript [4]

Interactive applications created on the H5P platform can run on computers, phones, tablets. Currently, H5P technology has been integrated on online teaching systems (LMS) built on Drupal, WordPress and Moodle platforms.

2.1.2. A number of application of H5P

Virtual Tour (Virtual Tour 360) - allows users to add questions, texts and interactions (video, audio, text, image) to multiple 360 environments using just a web browser. Users can explore models in a virtual environment (on computers or the internet).

Hot spot graphics – content type that allows the user to attach annotations to the graphic, when the learner moves to these hot spots, the screen displays accompanying instructions and key elements. Other interactive elements are available when clicking or hovering over the graphic.

Interactive videos – Instructors can easily embed quizzes and other elements in videos that make interactive learning content on H5P more enjoyable.

Course presentations – Similar to the above, users can use HTML5 to make presentations more interactive and engaging for the audience.

Learning games – Educators can use H5P to create learning games that are simple enough to engage learners.

Flashcards and interactive study guides – Flashcards are a popular choice to help learners prepare for exams and can also be useful in online learning. Interactive flashcards can help learners learn terminology and remember key pieces of information.

E-Textbooks – Instructors can create interactive e-textbooks, giving learners not only cost-effective but also quick access to core content.

2.1.3. Interactive question types included in H5P

- Type 1: True - False: Each question usually has two choices and in which one is determined to be TRUE, the other is determined to be FALSE.

- Type 2: Multiple Choice: Each question usually has multiple choices and some of them are determined to be the correct answer.

- Type3: Fill in the Blank: Each question has a box for test takers to enter the value of the answer.

- Type 4: Drag and Drop: Each question is usually divided into two parts. Test takers need to drag and drop objects into appropriate corresponding positions.

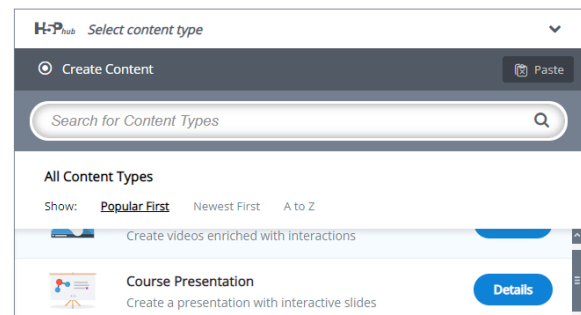
- Type 5: Hot Spot: Each question is usually represented by a certain photo and the test-taker needs to choose an appropriate location on that picture.

- Type 6. Hot Object: Each question usually has many objects and test takers need to select by clicking on one of those objects.

2.2. Building an interactive lesson design process with H5P

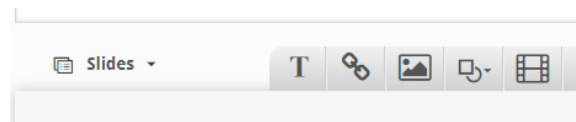
2.2.1. The process of building interactive e-lectures

Step 1. Select Course Presentation



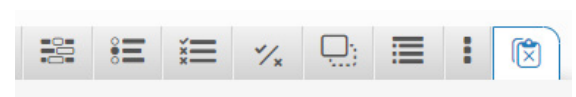
Step 2. Prepare lecture content

Lectures are presented in slide format. Lecture content can be composed in the form of Text, images, videos.



Step 3. Add interactive questions

Interactive questions are used in the following forms: Multiple choice questions, true and false questions, fill-in-the-blank questions, drag-and-drop questions, and picture-match questions.



Step 4. Package the lecture

Lectures are packaged as: HTML and SCORM that can be run on web browsers and online teaching systems.

Export settings

Format

All-in-one HTML file

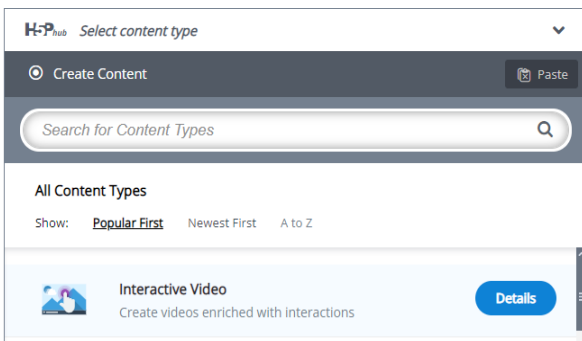
The file can grow too big for some computers if you include lots of media files.

One HTML file and several media files

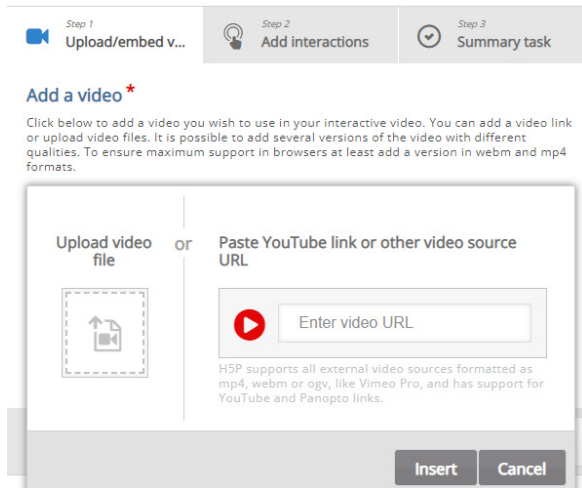
SCORM package

2.2.2. The process of building Interactive Video

Step 1. Select Interactive Video



Step 2. Upload the Video to create an interactive question



Step 3. Create interactive questions for the video

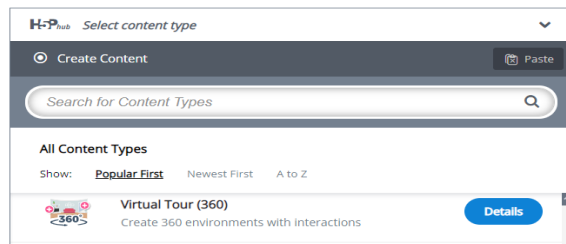
Interactive questions are used in the following forms: Multiple choice questions, true and false questions, fill-in-the-blank questions, drag-and-drop questions, and picture-match questions.

Step 4. Package the Interactive Video

Interactive video is packaged as: HTML and SCORM that can be run on web browsers and online teaching systems.

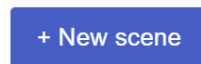
2.2.3. Interactive simulation building process

Step 1. Select 360 virtual tour





Step 2. Add scenes (simulations)

To add a picture, click the “New Scene” button



The images here can be still images, or 360o. images

Step 3. Create navigation between scenes

Icons above the image	This icon indicates whether the image is still  or  360°.
Green outline and green background	Highlight currently selected scene (current working scene)
“Set as Start Image” button	Icon to set the scene as the starting image for the simulation.
“Go to Image” button	Icon used to open the next image
“Edit” button	Click here to edit the image (Background, title, description, etc.)
“Delete” button	Click here to delete the model

Step 4. Connect the shapes in the simulation

Use the Go to Scene icon to connect the shapes in the simulation.



Step 5. Add Interactions

Select the point to create interactions and add interactions in the form of Text, images, audio, video



Step 6. Packaging the interactive simulation

The interactive simulation is packaged as: HTML and SCORM that can be run on web browsers and online teaching systems.

2.3. Product achieved

Applying the built process, the author has successfully built 3 products: Interactive videos, interactive lectures and interactive simulations, specifically:

* Interactive lecture on “Computer Architecture”.

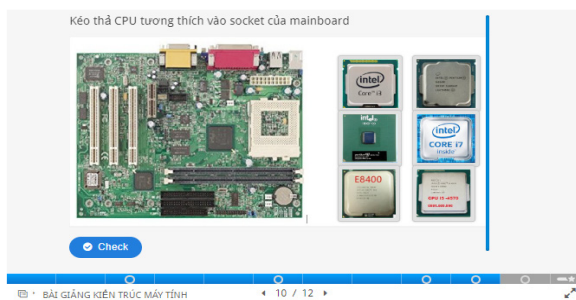


Figure 1. Interactive lecture

In the process of learning the lecture, at the end of each part, the learners will have to answer interactive questions, the learners can only study the next part when they have answered all the questions correctly. Learners will be recognized for completing the lesson when they have completed all the content.

* Interactive video “Instructions on the process of assembling CPU and RAM into MAINBOARD”

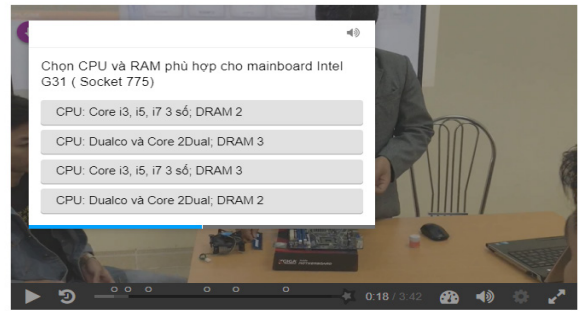


Figure 2. Interactive video

While watching the instructional video, learners must pause to answer interactive questions. Only when the correct answer is correct, the learner can see the next content. Learners will be recognized for completing the video tutorial when all questions are answered.

* Interactive simulation “Basic components of a computer”



Figure 3. Interactive simulation

Learners will learn the content through simulation models. Learners will actively learn through selecting simulation content corresponding to the annotations on the model.

3. Conclusion

On the basis of research on the application of H5P tools, the author has proposed 3 processes for designing interactive lectures. Realized by 3 corresponding

interactive lecture products. Currently, these products are being applied at the Information Technology Department - Viet Tri Industrial University to teach the Computer Architecture module. Because this module is not finished yet, the author has not yet evaluated the quantitative effectiveness of the learning outcomes. The quantitative evaluation of the effectiveness of the research product of the author's team will be published in another paper.

However, through observations and interviews with students, the authors found that students were more active when participating in learning, students felt more interested and understood the lecture knowledge more easily.

References

- [1] Nguyen Xuan Lac (2015), *Introduction to theory and modern teaching technology*, Vietnam Education Publishing House
- [2] Nguyen Xuan Lac (2015), *Virtual interactive teaching technology*, Educational Equipment Magazine, No. 122 (October 2015).
- [3] Nguyen Cam Thanh (2015), *Teaching technical practice by interactive approach in training technology teachers*, Doctoral thesis in education, Hanoi National University of Education
- [4] <https://h5p.org>, accessed October 25, 2022