

# H5P in the Educational Context – Methodological Applicability in the Classroom

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**Abstract.** Although H5P has been established as a widely used tool in teaching and learning for a few years now, there is almost no academic research available in this field. After briefly looking at the educational and technical aspects of H5P, we present a short pre-study in order to identify possible constraints but also didactic challenges. The findings link H5P activities to elements of Bloom’s taxonomy for identifying appropriate elements of teaching and learning competency-based curricula. After discussing the results, this paper concludes with considerations that need to be researched in the future.

**Keywords:** Education · H5P · teaching scenarios · Bloom levels.

## 1 Introduction

As MOOCs (Massive Open Online Courses) and other online learning formats become more prevalent, so does the use and adoption of H5P (HTML5 Package). At our department, we also rely on this technology in the context of open workshops, in the training of students and in projects. The feedback is very positive, but we also hear that the use of interaction can also be perceived as disruptive. So from a didactic point of view it makes sense to take a closer look at the right use of H5P in teaching scenarios.

With this contribution we aim to analyse which competencies (according to Bloom) can be covered well with it. Since we were only able to conduct a preliminary study, it is not the goal of this paper to make didactic recommendations, but the first results clearly show that H5P is not a “silver bullet” and that the technology is not equally well suited for all learning scenarios.

## 2 Background

Teaching and teaching scenarios have rapidly changed in the past decades of education. Digital technologies and media literacy have increased in significance. Using such digital technologies and media in the educational context is also described as e-learning. [2] In combination with digitisation, new teaching methods and techniques were developed, like blended learning, inverted and flipped classroom or MOOCs. H5P elements are applied in such teaching disciplines.

The terms *flipped* or *inverted classroom* describe a teaching method where students acquire their knowledge at home and have discussions about the topic in class. [6] In addition, the significance of MOOCs has been increased (not only) by the push towards online teaching in recent years. *edX.org*, one of the leading online courses platforms, defines the term as follows: MOOCs “are free online courses available for anyone to enrol.” [3] At least since the pandemic, where education and further training had to be transitioned to online settings, MOOCs kept not only growing but it seems they were needed more than ever.

E-learning, therefore, is a generic term for learning or teaching which includes or consists of digital technologies. Such digital tools can also be an H5P element supporting the learning process. To understand the usage of H5P in the educational context and its possible applications in teaching or learning methods, the H5P framework is described briefly.

H5P is an open-source framework for interactive learning content that was first released in 2013. [4] The H5P plugin needs to be integrated into a learning or content management system such as Moodle, Drupal or WordPress. Once it is installed and activated, H5P activities can be created or uploaded from other sources. The activities are stored on the server of the platform and can be embedded on other websites (if enabled). The H5P core framework is written in PHP and JavaScript, while the content types are developed in JavaScript and CSS. As H5P is an open-source project, contributing is possible in several ways, even by creating new content types that can be integrated into the framework.

H5P currently offers 46 content types which can be downloaded through the core system. [4] For each content type, a guideline that describes how to use it is available on the H5P website. As an example, *Interactive Video* is a popular content type that allows adding various interactions such as images, questions (single or multiple choice, free text, etc.), or drag and drop. The *Branching Scenario* allows the creation of content that is displayed according to the user’s selections. Activities created with H5P can be re-used, embedded on other websites or shared on the H5P Hub which supports the idea of OER (Open Educational Resources).

In the literature, there are many papers, articles and internet sites about creating, using and providing H5P in tutorial or higher educational settings. Some examples are the *Enhancing Digital Teaching & Learning Project* [5]; the paper of Wicaksono et al., which presents a case study of using H5P in teaching English [7]; the open library of eCampusOntario<sup>1</sup> with over 600 OER in 15 subjects; or the website of H5P itself.

Furthermore, the study shown in this paper focuses on the taxonomy levels developed by Bloom. [1] This taxonomy provides the opportunity to categorise competencies into cognitive levels, based on keywords they contain. The six taxonomy levels are (lowest to highest): *remembering*, *understanding*, *applying*, *analysing*, *evaluating*, and *creating*.

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<sup>1</sup> <https://www.ecampusontario.ca/>

### 3 Applicability Considerations

In our pre-study, we asked five teachers and students with teaching experience who have used H5P before to assign the H5P content types to levels of Bloom’s taxonomy to identify whether H5P addresses all levels equally or not. The participants had to decide – based on their subjective opinion – which level(s) of Bloom’s taxonomy can be supported by one specific H5P element.

It was possible to tick more than one level and also to skip a level. The column “others” could be chosen if the element fits nowhere, i.e. if it is for layout purposes only. Our assessors, three student teachers with teaching experience, one long term teacher and one researcher in the field of informatics didactics, performed the categorisation. Table 1 shows an abstract of the results of the study.<sup>2</sup> Horizontally, the levels according to Bloom and vertically, the different H5P content types are applied. The relevant combinations are ticked if the reviewers saw an application of H5P to acquire the associated Bloom’s taxonomy level. The darker the colour, the more assessors identified the corresponding combination as applicable.

It is important to note that due to the limited space only a few selected content types out of all 46 existing ones (those providing a high applicability in our eyes) are shown. While Table 1 might indicate that all taxonomy levels are covered, please refer to the full results for a complete overview.

	Remembering	Understanding	Applying	Analysing	Evaluating	Creating	Other
Arithmetic Quiz	Dark	Light	Dark				
Audio Recorder	Dark	Light	Light	Light			Light
Branching Scenario	Dark	Dark	Dark	Dark	Light	Light	
Chart	Dark	Light	Light	Dark	Light		Light
Documentation Tool	Light	Light	Light	Dark	Dark	Dark	Light
Drag and Drop	Dark	Light	Light				
Fill in the Blanks	Dark	Light	Light				
Find the Hotspot	Dark	Light					
Guess the Answer	Dark						
Interactive Book	Dark	Dark	Dark	Dark	Dark	Dark	Light
Interactive Video	Dark	Light	Light				
Multiple Choice	Dark	Light	Light				

Table 1: Mapping of selected H5P types to Bloom’s taxonomy

<sup>2</sup> Full results: <https://web-iid.aau.at/~sci/ISSEP21-Appendix-BruggerEtAl.pdf>

It is discernible that the reviewers have categorised many of the H5P elements to the first and second levels of Bloom's taxonomy. Most elements can be applied and assessed for competencies that cover cognition levels of remembering and understanding. However, just a few can cover higher cognition levels, such as analysing or evaluating. More than two assessors share the opinion that the elements *Interactive Book*, *Documentation Tool* and *Branching Scenario* are applicable at every level.

## 4 Conclusion and Outlook

In this paper, we briefly motivated the use of H5P in the context of e-learning settings and showed that although there are quite a few articles and projects on the use of H5P, there is no literature that systematically explores the didactic possibilities. We, therefore, enriched this lack of scientific work by a preliminary study. It analyses the potential of H5P to promote competency-based instruction. A mapping of the individual H5P elements to the different Bloom's levels shows that not all levels are covered equally well and that especially the lower levels are supported. This should therefore be considered and taken into account in the context of material design.

In summary, H5P seems to be useful in the classroom nevertheless due to the motivation and variety factor alone. Now that the COVID-19-related limitations have largely been reduced, it is easier to motivate students to participate in follow-up studies and, in addition to repeating the studies on a larger scale, we plan to take a closer look at the following issues: the dependence on learning types and age, the connection with brain-friendly teachers, and the expansion of H5P to better support additional Bloom levels as well. Additionally, we plan to discuss the impact of H5P on the learning process in more depth, as well as to conduct a master thesis which covers a larger audience, based on this pre-study.

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