

Article

The Effectiveness of Using H5P for Undergraduate Students in the Asynchronous Distance Learning Environment

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Abstract: As the COVID-19 pandemic caused many schools to go online, asynchronous distant learning has become popular. One of the main challenges of asynchronous distance learning is keeping students engaged and motivated, as they do not have the same engagement with their peers and teachers as in traditional face-to-face learning environments. HTML 5 package (H5P) is an interactive learning tool that has the potential to fill this need due to its numerous immediate interactive features, such as interactive videos, pop quizzes, and games during media playback. This study investigates the effectiveness of using H5P and Moodle in asynchronous distance learning environments for undergraduate students. The data collection methods included pre-and post-surveys for Moodle and H5P and the questions related to the student perspectives towards H5P features. The technology acceptance model (TAM) is employed to find student satisfaction. The results of this study suggest that both the H5P and Moodle could be valuable tools for making E-learning more effective. The interactive and engaging nature of H5P can provide students with a more enjoyable and effective learning experience, helping to keep them motivated and engaged throughout their studies.

Keywords: advanced technologies; E-learning; H5P; interactive learning; learning analytics



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1. Introduction

Due to the decline in coronavirus infections in many regions, online teaching and learning have reverted to face-to-face education [1]. Even though the transformation in education has happened, many instructors continue to utilize these blended learning technologies to teach their students [2,3]. During the pandemic, educational technology tools increased and enhanced student learning results [4,5]. Consequently, some instructors continue to use synchronous, asynchronous, and blended methods of instruction. Due to the rise of technology, learning is considered adaptable, and teachers must be digitally proficient in supporting their students throughout their education [6,7]. Moreover, educators must design the course properly and engage their students in learning [8,9].

The H5P is a free, interactive toolkit that can interface with an open-source learning management system such as Moodle [10,11]. To make students involved, teachers may construct multiple-choice questions, quizzes, essays, fill-in-the-blank questions, and more [12,13]. H5P covers 52 content categories. When the tool boosted course comprehension, students' motivation to study increased. H5P's plug-in integration with open-source LMSs such as Moodle and browser-based content development are advantages [14]. By incorporating interactive parts, the video content may be reused [15].

The pandemic's quick shift to online learning may affect students' attendance. All instructor-led events are now web-based. Consequently, course instructors focused on curriculum reform. According to teachers, students are less interested in the class than in face-to-face instruction [16]. Because students are physically away from the classroom

in distance learning, ensuring their involvement in classwork is challenging. The quality of online courses might cause students to feel detached from the subject matter. Online learning with H5P incorporates students' engagement in specific courses more than conventional learning [17,18]. The instructors can visualize the students' performance and provide interactive material that assists students in enhancing their course knowledge. H5P has interactive video as one of its significant features. This feature enables the addition of several evaluation types, such as quizzes, fill-in-the-blank, and multiple-choice questions [19]. It also improves students' practical learning experience and helps them attain high course grades [20].

Few studies have examined how H5P is used and how students interact and learn when using it. This research aims to find the impact of integrating H5P on students' attention and interaction in an asynchronous distance learning environment and to evaluate the acceptance of H5P and the built-in lesson module in Moodle. Moreover, the study analyzed the students' satisfaction using H5P and its features. A questionnaire covering TAM components for Moodle and H5P is created and distributed to students at the beginning and end of the course.

The remaining sections of the paper are divided into five sections, each focusing on a distinct aspect of the subject matter. The literature review is explained in Section 2 with a detailed background of the related works. The study's methodology is in Section 3, followed by result analysis in Section 4, and discussion in Section 5. Finally, the study is concluded in Section 6.

2. Literature Review

Interactive learning can also increase engagement levels [21,22]. With Moodle, the students lacked customization in the learning process [23], and with the H5P, students can be more involved in their learning process [24,25]. The study by [26] supports using digital platforms in education and offers valuable insights into how active learning tactics may improve student learning outcomes. Students with specific learning styles may struggle with online education. Parents' support, a reliable internet connection, and a comfortable home environment during online learning improve students' education attitudes. Students are eager to utilize online learning if the platform is user-friendly [27], provided they have sufficient internet access [28]. As they go through their education, students encounter various technological challenges that need institutions' provision of training and digital assistance. When remote learning is used, it is difficult for teachers to maintain their students' engagement and motivation.

Wicaksono et al. [29] used H5P in the English course for efficient learning, favorably influencing students' English learning abilities. The benefits of H5P for learning include interactive learning, inspiring students, catching their attention, enhancing learning quality, and assisting students in retaining the material [30]. Integrating H5P into the Moodle learning system has benefited both students and instructors. This tool is essential because it promotes more significant self-directed learning [31–33]. It also facilitates the simple conversion of current video to suitable digital material [34]. Integrating questions in the video lecture makes the students more interactive in learning [35].

The sudden swiftness of online instruction during the COVID-19 pandemic had an adverse effect on student participation. Knowing the expectations of online students can help institutions increase student satisfaction while enhancing their long-term success [36,37]. It is challenging to measure how focused and engaged students are during asynchronous online learning [38]. Students felt that their level of engagement towards learning increases during self-paced learning than in collaborative learning [39]. It has been suggested by Izquierdo and Galindo [40] that evaluating students in programming classes with the help of H5P services can provide a method that is both more interesting and more accurate. Additionally, H5P can be utilized to give a more comprehensive review process by supplementing conventional assessment techniques.

Asynchronous learning helps students develop a self-learning culture [41]. Li and Reis [42] found that H5P helped to enhance student engagement and participation in the course. It is a valuable tool for educators to engage and make online learning experiences interactive for students. Another study has made H5P in chemistry to help students understand chemical bonds [43]. They achieved an assessment result of 84.66% in quality of interactive media testing with 31 students. The study by [44] also used digital learning to understand students' concepts of raw materials in chemistry. Another work by Godlewska et al. [45] used H5P in-field training. They conclude that digital fieldwork cannot replace actual fieldwork. However, it can still supplement it, give access to remote areas, assist multidisciplinary teaching initiatives, and provide a different option for diverse learners.

Davis created the TAM model, commonly used today, in 1985 [46]. It is used to determine whether users accept using computers or other technologies. The TAM was broadened to include more variables that affect behavior intention as criticism of the TAM arose [47,48]. Many studies used the TAM model and the extended TAM to determine whether or not a specific technology should be accepted or rejected for a given application [49]. The TAM model can analyze Moodle's acceptability and use from a scientific perspective [50]. It is also used to evaluate the acceptance of e-learning, massive open online courses (MOOCs), online reservation systems, and virtual reality in learning [51–54].

3. Materials and Methods

In this study, the TAM model was employed to determine the acceptance level of students in Moodle and H5P, as shown in Figure 1. We included external variables such as perceived performance expectancy (PPE), information quality (IQ), system quality (SQ), and self-efficacy (SE). PPE assesses the student's performance and belief in achieving their expected academic performance. The materials uploaded in the digital learning are consistent, understandable, and related to the course, indicated in IQ, while the privacy and system access are assessed in SQ. How well the students can learn on their own is shown in SE.

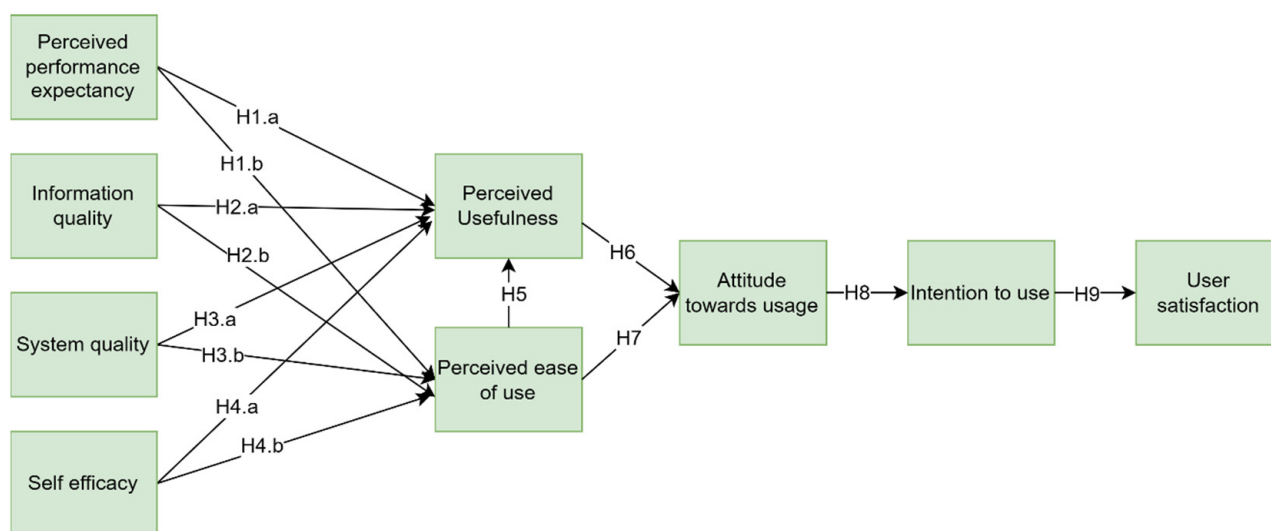


Figure 1. The acceptance model for interactive learning.

Perceived usefulness (PU) and perceived ease of use (PEU) are the primary characteristics demonstrating a willingness to utilize the technology. The degree to which an individual believes that employing the system would increase their capacity to accomplish their job duties is represented by their perceived utility (PU). PEU assesses the difficulty of using the technology physically or psychologically. Students' perspective and attitude towards using the H5P and Moodle is shown by the construct attitude towards usage (ATU).

The research hypotheses based on the TAM model (Figure 1) [46,48,51] in the context of H5P and Moodle learning are:

Hypothesis 1a (H1a). *Perceived performance expectancy (PPE) is significantly associated with the learning tool's perceived usefulness (PU).*

Hypothesis 1b (H1b). *Perceived performance expectancy (PPE) is significantly associated with the learning tool's perceived ease of use (PEU).*

Hypothesis 2a (H2a). *Information quality (IQ) is significantly associated with the learning tool's perceived usefulness (PU).*

Hypothesis 2b (H2b). *Information quality (IQ) is significantly associated with the learning tool's perceived ease of use (PEU).*

Hypothesis 3a (H3a). *System quality (SQ) is significantly associated with the learning tool's perceived usefulness (PU).*

Hypothesis 3b (H3b). *System quality (SQ) is significantly associated with the learning tool's perceived ease of use (PEU).*

Hypothesis 4a (H4a). *Self-efficacy (SE) is positively associated with the learning tool's perceived usefulness (PU).*

Hypothesis 4b (H4b). *Self-efficacy (SE) is positively associated with the learning tool's perceived ease of use (PEU).*

Hypothesis 5 (H5). *Perceived ease of use (PEU) is positively associated with the learning tool's perceived usefulness (PU).*

Hypothesis 6 (H6). *Perceived usefulness (PU) is positively associated with the attitude toward using (ATU) a learning tool.*

Hypothesis 7 (H7). *Perceived ease of use (PEU) is positively associated with the attitude toward the learning tool's usage (ATU).*

Understanding a student's goal and motivations for utilizing a tool is known as an intention to use (IU). The user satisfaction (US) construct determines the student's satisfaction with the tool. The research hypotheses based on the constructs in the context of H5P and Moodle learning are:

Hypothesis 8 (H8). *Attitude towards usage (ATU) is positively associated with the intention to use (IU) the learning tool.*

Hypothesis 9 (H9). *Intention to use (IU) the learning tool is positively associated with user satisfaction (US).*

As illustrated in Figure 2, the research approach consists of five steps. In the first step, hypotheses were created. We chose the H5P tool to be used among all other kinds to better explain the content material based on instructional design and narrative scenario as the second step. Numerous studies have shown the positive effect of combining questions with video information on students' understanding [19]. Therefore, we used the interactive video tool in H5P, which allows us to pause the video at any point and add pop-up questions of various varieties. It includes multiple-choice, fill-in-the-blank, true/false, short answer, drag-and-drop, matching, word sorting, and more. The interactive video also prevents

students from skipping portions of the film and may include a control for redirection depending on the students' responses.

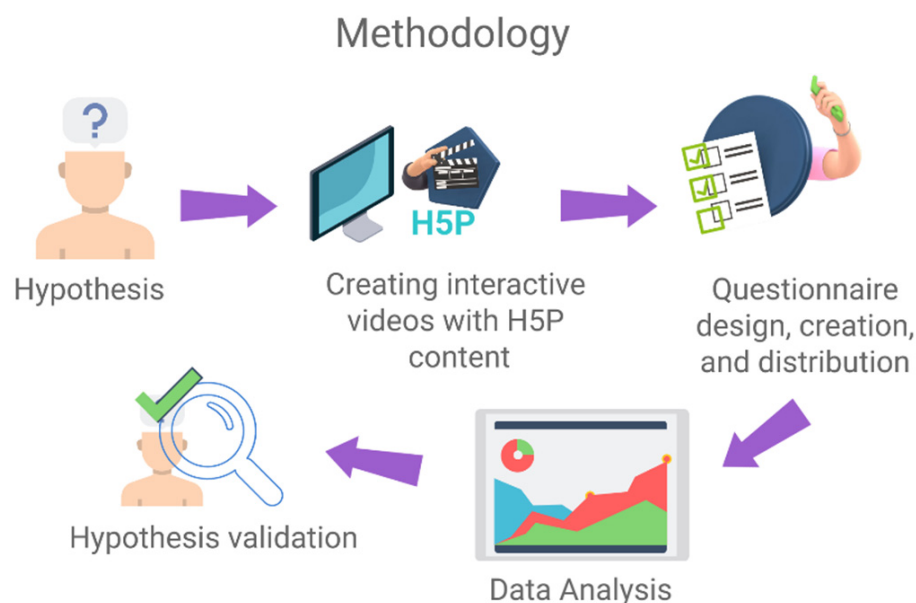


Figure 2. Methodology flow of the study.

Before administering the questionnaire, each student was exposed to a complete chapter delivered through Moodle Lessons, followed by an entire chapter delivered via H5P. Moodle Lessons is an embedded learning module available with every Moodle installation. It allows the teacher to provide content followed by questions with the ability to manipulate the student's learning flow depending on their responses. Text or multimedia might be used for instructions.

The questionnaire includes a Likert scale and free-form questions (third step). When using the Likert scale, the lowest possible score is a 0 (strongly disagree), and the highest is a 5 (strongly agree). Before disseminating the final version, a pilot sample was tested, and questions were adjusted based on the results. The subsequent step involves collecting survey answers and analyzing the learning efficiency of pupils.

The questionnaire comprises 9 constructs: PPE, IQ, SQ, SE, PU, PEU, ATU, IU, and US. Each of these constructs has specific loadings called items (Table A1). Other than these items, some open questions were also asked. It includes the advantages and disadvantages the students undergo while learning with the tool, their name, age, gender, and education department. The pre-survey was circulated to students based on Moodle, and the post-survey after the students were exposed to H5P lessons.

The data were examined in the fourth phase based on pre-and post-survey findings. Knowing how students' opinions of the digital learning tool alter over time and what variables may affect their acceptability and utilization of the technology helps determine the areas needing development and create plans to boost it. Finally, the hypotheses were analyzed based on the significant value ($p = 0.05$). Regression analysis was used to evaluate the model. In the process of regression analysis, the assumption known as the null hypothesis is that the dependent and independent variables do not have a significant association. It is rejected if the p-value is less than 0.05, and thus the model can be used to find the user behavior in accepting the technology.

A quantitative methodology was used for the research. This is performed by compiling the numerical data of the students and applying statistical analysis to test the hypotheses indicated earlier.

Measures

Cronbach's alpha measures internal consistency to evaluate scale or questionnaire reliability [55]. It assesses if scale or questionnaire items measure the same construct. Calculating the average inter-item correlation across all scales or questionnaire items yields Cronbach's alpha. Alpha values vary from 0 to 1, with higher values (greater than 0.7) suggesting greater internal consistency [56]. The pre-and post-survey reliability values are analyzed, as shown in Table 1. The items were removed for some constructs with a Cronbach's alpha value of less than 0.65. For Moodle, IQ4 was removed from the construct IQ and SQ2 from SQ to make the reliability score higher. Similarly, in H5P, PPE2, PU3, and PEU4 were removed.

Table 1. The reliability of the items.

Constructs	Cronbach's Alpha (Moodle)	Cronbach's Alpha (H5P)
PPE	0.920	0.786
IQ	0.706	0.938
SQ	0.723	0.782
SE	0.824	0.855
PU	0.873	0.955
PEU	0.883	0.697
ATU	0.816	0.892
IU	0.934	0.853
US	0.846	0.900

4. Results

4.1. Content Creation

All videos were produced using the Camtasia screencasting application. Depending on the chapter, it was then uploaded to the Moodle LMS as Lessons or H5P. The questions were added to the videos depending on the instructional design of the material after it was published. Different questions and responses were chosen depending on the subject matter and integrated with the H5P plug-in within the University's Moodle LMS. Students may attempt the answer again if they do not comprehend the topic. In the instance of H5P, the student must watch the complete video since the option to advance has been restricted. Figure 3 displays the lessons prepared using the Moodle Lesson tool and the H5P. Both chapters feature the same number of videos. However, some Moodle lessons contain more than one video.

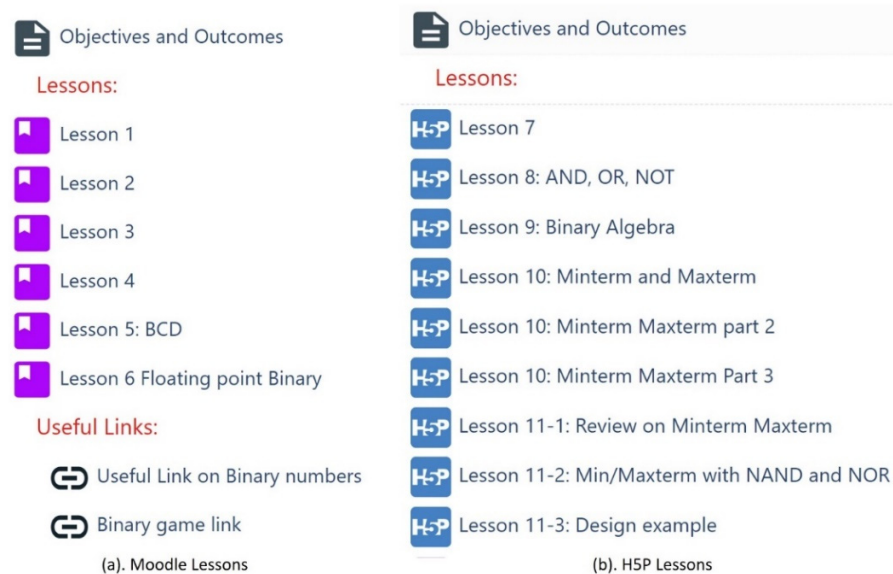


Figure 3. Screenshot of the (a) Moodle lessons and (b) H5P lessons created for students.

The H5P content included multiple-choice, drag-and-drop, true or false, fill-in-the-blank, and single-choice questions. Figures 4 and 5 are illustrations of these patterns. Figure 4a provides examples of the single-choice question for which only one response is applicable. Figure 4b displays the true or false pattern. When students answer a question wrong, they are offered three choices. They may either retry the query or see the answer; otherwise, they can proceed without retrying. The teacher can evaluate the statistics of each student’s question attempts.

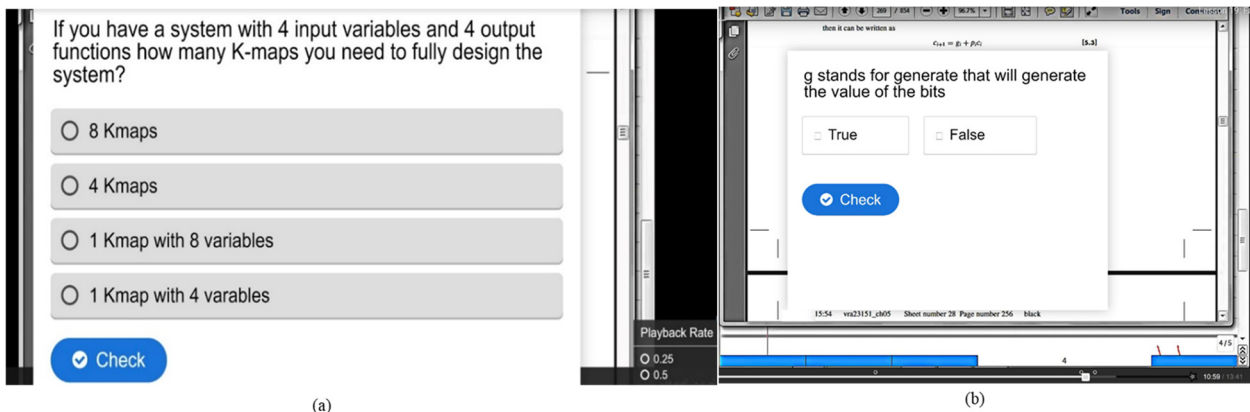


Figure 4. (a) Screenshot of a single-choice question in the video. (b) Screenshot of a true-or-false question in the video.

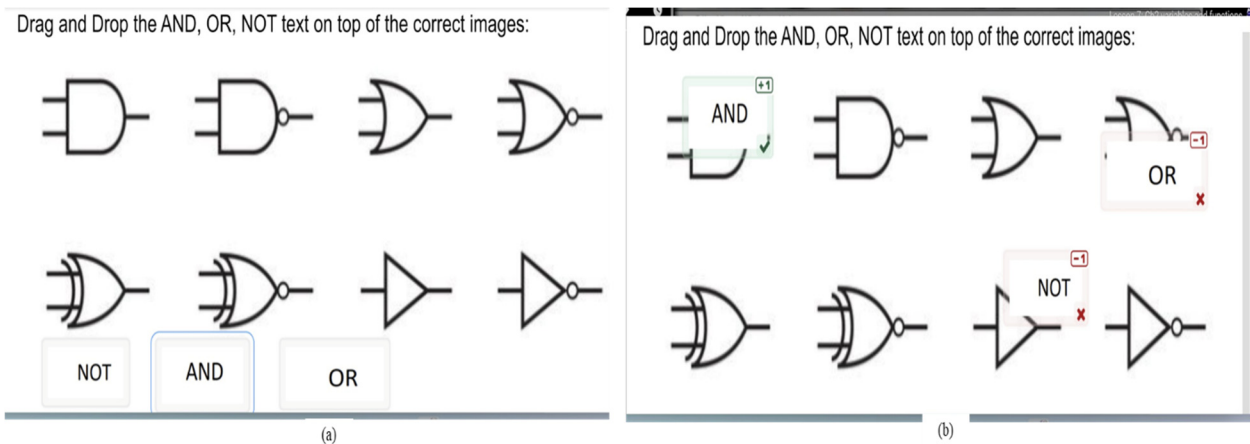


Figure 5. (a) Screenshot of drag and drop option in the video. (b) Screenshot of instant feedback option with grade points.

The students receive immediate feedback after the submission of each answer. Additionally, instant grading points can be seen with feedback. Figure 5a shows the drag-and-drop option screenshot used in the video, and Figure 5b depicts the instant feedback results. The instructor can visualize the attempts made by each student from the report generated by the H5P content (Figure 6).

4.2. Data Analysis

The study population is two sections registered in a Fundamental of Logic course at Kuwait University, with 69 students participating in this survey. All the students were in the age group between 17 and 25 years. Around 83% of the participants were female, and 17% were male. The survey was opened to all enrolled students at the end of the course. The sampling technique employed in this study is convenience sampling. Although it is a helpful method for collecting data, in this case, it was only students who were enrolled in the same classes surveyed; hence, the sample does not represent all the students who attend

the university. As a result, gathering more data after including H5P in other coursework may be considered a potential advancement in the future.

Overview
See all course grades

Name	ID number	Email address	<input type="checkbox"/> Select all attempts	High score
MA	210000000	210000000@u.kw	<input type="checkbox"/> 55.56% Thursday, 5 August 2021, 12:30 AM (1 hour 37 mins)	55.56%
SA	210000000	210000000@u.kw	<input type="checkbox"/> 22.22% Wednesday, 4 August 2021, 4:37 PM (now) <input type="checkbox"/> Wednesday, 4 August 2021, 11:23 PM (1 hour 4 mins)	22.22%
HA	210000000	210000000@u.kw	<input type="checkbox"/> 66.67% Thursday, 5 August 2021, 2:48 AM (1 hour 49 mins)	66.67%
AA	210000000	210000000@u.kw	<input type="checkbox"/> 55.56% Tuesday, 3 August 2021, 1:07 PM (now) <input type="checkbox"/> Thursday, 5 August 2021, 1:50 AM (3 secs)	55.56%
AmA	210000000	210000000@u.kw	<input type="checkbox"/> 66.67% Wednesday, 4 August 2021, 1:00 PM (now) <input type="checkbox"/> Thursday, 5 August 2021, 6:58 AM (52 mins 11 secs)	66.67%

Figure 6. Screenshot of the attempt report of students. The student’s IDs and mail addresses are not disclosed to protect their privacy.

The features of H5P within the video content were analyzed from the student’s data. It consists of nine Likert-scale questions (Table A2). The features of H5P, like the retry option and restriction to skip the video, make students a little bored and time-consuming. As shown in Figure 7, around 80% of the students mentioned that limiting the video’s timeline made them forcibly hear the whole lecture every time (Q1), and 60% felt bored (Q2). Moreover, the students thought that the preferred method increased their attention, and instant feedback on results increased their knowledge about the subject. The students have a favorable view of integrated learning. The majority anticipate an improvement in their academic performance. Approximately 68% of students said the video’s instructional quality was satisfactory.

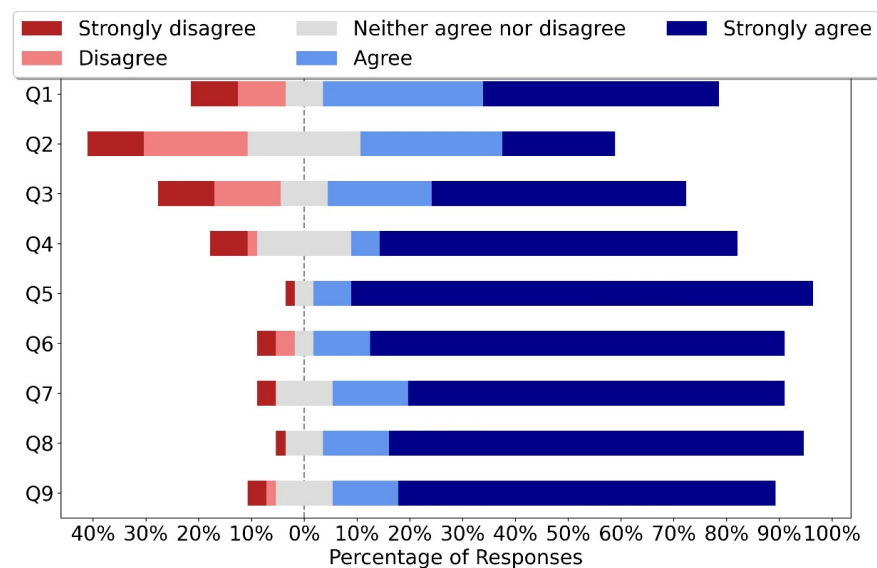


Figure 7. Likert-scale question analysis of H5P features.

The regression results are depicted in Table 2 for Moodle (pre-survey). The regression analysis helps to determine the elements that influence students' acceptance of technology as a learning tool. The construct PPE and IQ are significant predictors of PU and PEU. At the same time, it does not support the prediction of PU and PEU when the quality of the material (SQ) and self-efficacy (SE) of the students are concerned. The PEU is not associated with PU, and thus it does not enhance the use of Moodle in learning. PEU and PU are significant predictors for building a positive attitude (ATU) while using technology. The student's attitude positively impacts the intention to use (IU) the tool, and they accept the use of Moodle and are satisfied (US) with using the tool for learning.

Table 2. Regression analysis result of Moodle survey.

Hypothesis	Constructs	t-Test	Confidence Interval		sig *	Status
			Lower 95%	Upper 95%		
H1a	PPE->PU	3.219	0.101	0.535	0.008	Supported
H1b	PPE->PEU	3.517	0.272	1.181	0.005	Supported
H2a	IQ->PU	3.028	0.102	0.647	0.011	Supported
H2b	IQ->PEU	2.379	0.053	1.362	0.037	Supported
H3a	SQ->PU	1.797	-0.063	0.624	0.099	Not supported
H3b	SQ->PEU	2.036	-0.055	1.402	0.067	Not supported
H4a	SE->PU	1.425	-0.131	0.613	0.182	Not supported
H4b	SE->PEU	1.386	-0.303	1.332	0.193	Not supported
H5	PEU->PU	1.852	-0.042	0.488	0.091	Not supported
H6	PU->ATU	6.950	1.131	2.179	<0.001	Supported
H7	PEU->ATU	3.009	0.151	0.976	0.012	Supported
H8	ATU->IU	5.856	0.634	1.398	<0.001	Supported
H9	IU->US	4.169	0.302	0.977	0.002	Supported

* sig: the *p*-value from the regression analysis.

Table 3 explains the regression analysis results of H5P technology in learning (post-survey). The PPE has a positive impact on PU and PEU. The quality of the content (IQ) (to PEU) and SQ are not supported and must be improved to obtain more student attention. Similarly, the SE is also not supported. The PEU is associated with PU, thus enhancing the use of H5P in learning. PU is a significant predictor for building a positive attitude (ATU), while PEU does not support the ATU's use of technology. The students' attitude positively impacts IU, and they accept the use of the H5P and are satisfied (US) with using the tool for learning.

Table 3. Regression analysis result of the H5P survey.

Hypothesis	Constructs	t-Test	Confidence Interval		sig *	Status
			Lower 95%	Upper 95%		
H1a	PPE->PU	6.666	0.981	1.949	<0.001	Supported
H1b	PPE->PEU	3.027	0.207	1.309	0.012	Supported
H2a	IQ->PU	3.847	0.159	0.583	0.003	Supported
H2b	IQ->PEU	1.005	-0.116	0.311	0.336	Not supported
H3a	SQ->PU	1.658	-0.074	0.528	0.126	Not supported
H3b	SQ->PEU	0.586	-0.167	0.289	0.570	Not supported
H4a	SE->PU	1.613	-0.096	0.621	0.135	Not supported
H4b	SE->PEU	-0.015	-0.275	0.272	0.988	Not supported
H5	PEU->PU	2.909	0.234	1.686	0.014	Supported
H6	PU->ATU	3.498	0.296	1.300	0.005	Supported
H7	PEU->ATU	0.654	-0.732	1.352	0.526	Not supported
H8	ATU->IU	5.953	0.504	1.096	<0.001	Supported
H9	IU->US	7.121	0.611	1.158	<0.001	Supported

* sig: the *p*-value from the regression analysis.

5. Discussion

This study's findings show that a few hypotheses of Moodle and H5P are supported, while some of them are not. In the perception of students' performance, the Moodle and H5P tools are positively associated with usage. While the IQ needs to be improved for

H5P learning, it is accepted by the students in Moodle learning. The SQ and SE in Moodle and H5P have no role in predicting the student’s perceived usefulness and ease of using the tool. Figure 8 shows the final model with the positive predictor’s association in the TAM model for H5P and Moodle. It shows which factors influence student satisfaction and usage of the learning tools. The ATU is associated with IU, and the students are satisfied with using both models in their learning. However, the PEU is only related to PU in H5P, enhancing the utilization of H5P in learning.

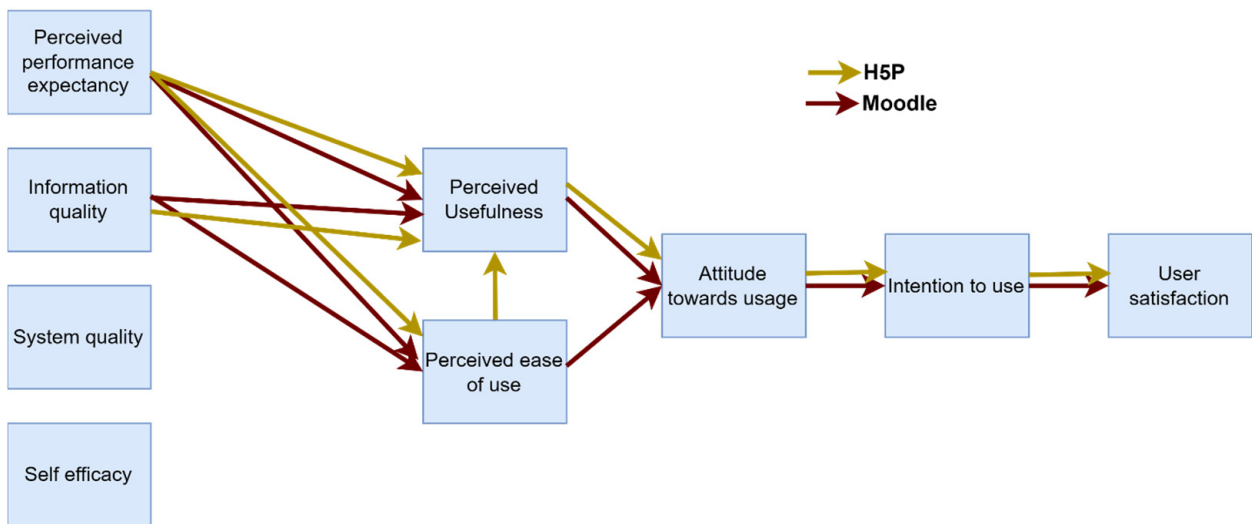


Figure 8. The factors influencing students’ satisfaction and use of the tool (Moodle and H5P).

Figure 9 illustrates the advantages of employing H5P in the course. Eighty-two percent of the students said they could retain their focus on learning. The video contains several questions that assess their comprehension of the presented subjects. Consequently, the learners are motivated throughout the learning process. Other advantages include time savings, enhanced cognitive abilities, and idea reinforcement.

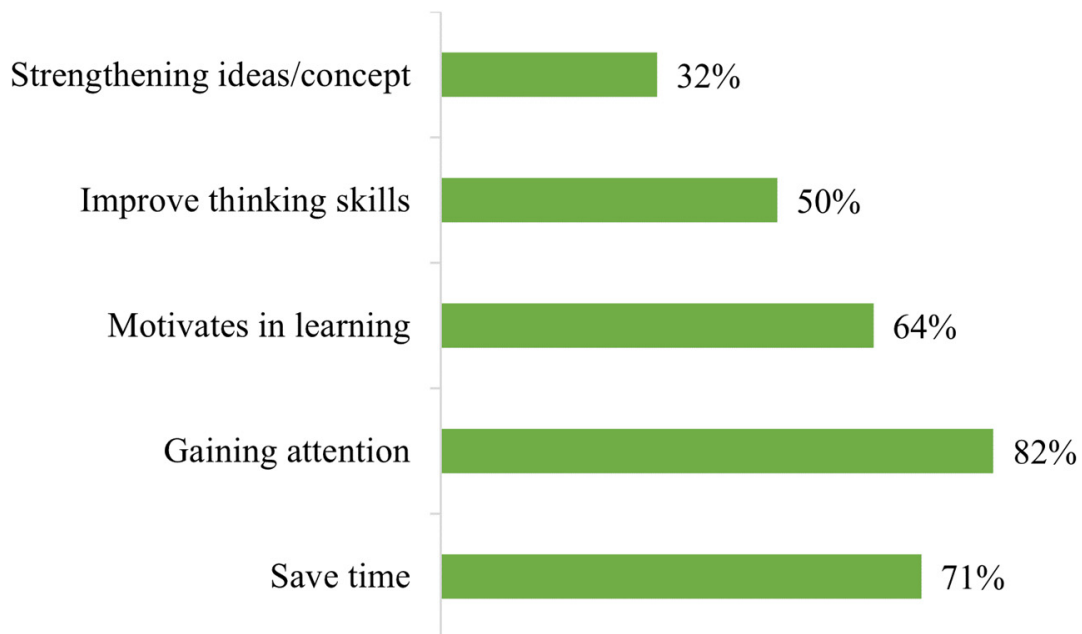


Figure 9. Benefits of using the H5P tool according to students.

5.1. Implications

This study has a positive effect on E-learning for higher education. The COVID-19 pandemic provides a chance for educational institutions to assess and improve their online education and learning capabilities to prepare for any future pandemic. The research examined how well H5P and Moodle worked together in asynchronous online learning environments and how well the students accepted them. Utilizing interactive video H5P content might increase the student's desire to educate. Educators may consider integrating interactive videos in their courses to help the students be more attentive and interactive during their learning. Integrating questions between the concepts helps students identify their understanding of the subjects. It also provides flexibility to students and improves their critical thinking skills.

5.2. Limitations and Future Work

The TAM model was analyzed with one specific academic course in this study. While both platforms can be used to create a wide range of activities, they may not be suitable for more complex or specialized content. Including H5P in more courses in different colleges will be a future enhancement. Moreover, more student participants must be added from various colleges after integrating H5P into their learning. It is important to note that the gender composition of the sample was skewed towards females. In future work, efforts will be made to recruit a more balanced sample with equal representation of both genders.

6. Conclusions

Technology utilization and integration should be governed by educational requirements to enhance learning outcomes. H5P is a versatile and powerful tool that can help to strengthen the effectiveness of online learning and helps to keep students motivated and engaged. At the same time, its analytics and tracking tools can provide educators with valuable insights into how engaged students are and how well they learn. This research assessed the effects and efficacy of utilizing the H5P tool inside an LMS and compared it to Moodle for undergraduate asynchronous distance education. According to the result of this research, both the H5P and Moodle can potentially be valuable tools for improving the effectiveness of online education. However, H5P shows a positive in utilization. Students can increase their critical thinking and problem-solving skills and their understanding of the course contents using H5P.

Author Contributions: Conceptualization, methodology, supervision, data acquisition, and writing—review, A.M.M. and J.A.K.A.M.; methodology, experiment, and writing—original draft preparation, S.S. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The questionnaire and methodology for this study were approved by the office of the vice dean for academic affairs for research and graduate studies at the College of Engineering and Petroleum at Kuwait University.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data are unavailable due to privacy or ethical restrictions.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Likert-scale questions of the TAM model.

Construct	Question
PPE	PPE1: I believe my knowledge about each lesson’s concept is better with the learning tool. PPE2: I will meet my expected academic grade with the help of the learning tool. PPE3: With the help of the learning tool, I can improve my memory. PPE3: With the help of the learning tool, I can improve my memory.
IQ	IQ1: The course materials integrated with the learning tool are relevant to the course. IQ2: The course materials uploaded in the learning tool are consistent. IQ3: The course materials uploaded in the learning tool are easy to understand. IQ4: The course materials uploaded in the learning tool are updated frequently.
SQ	SQ1: I can access the learning tool on any device from anywhere without any problem. SQ2: The video quality in the learning tool has good resolution. SQ3: The privacy of my information is trustworthy in the learning tool. SQ4: The learning tool is convenient compared to face-to-face learning.
SE	SE1: I feel confident that I can use the learning tool efficiently. SE2: I can overcome technical issues on my own. SE3: Performing well in the course made me feel good about myself. SE4: I can manage my time efficiently using the learning tool. SE5: I can understand the lessons independently with the help of the learning tool.
PU	PU1: The learning tool used will improve my learning performance. PU2: The learning tool used will improve my academic productivity. PU3: The learning tool will make studying course lessons easier. PU4: The learning tool used will enhance the effectiveness of learning.
PEU	PEU1: The learning tool is easy to use. PEU2: The learning tool used for lessons makes me more skillful. PEU3: The learning tool used for each chapter is understandable. PEU4: The learning tool used is more flexible for my use.
ATU	ATU1: Studying using the learning tool is a good idea. ATU2: I feel optimistic about using the learning tool for learning. ATU3: I believe the learning tool helps me be more engaged in learning. ATU4: I generally favor using the learning tool in the learning process.
IU	IU1: I intend to use the learning tool to increase my attention during learning. IU2: I intend to use the learning tool since it motivates me during learning. IU3: I intend to use the learning tool throughout this and next semester. IU4: I intend to use the learning tool as often as possible.
US	US1: I am delighted with the learning tool used. US2: I feel very confident in using the learning tool for learning. US3: I believe the quality of the education system will increase using this method. US4: I am satisfied that the learning tool meets my educational needs.

Appendix B

Table A2. Likert-scale questions of H5P features.

Question
Q1: The feature of not being able to move the timeline of the video forced me to hear the full video.
Q2: The feature of not being able to jump and skip in the video location sometimes makes me bored.
Q3: I tried the video speed feature in H5P to speed up or slow down the video playback.
Q4: I find the feature to speed up or slow down the video playback instrumental.
Q5: Pop questions appearing during the interactive video in H5P increased my alert and helped keep my full attention on the video, especially since I could not control the playback path.
Q6: The appearance of questions during the video in H5P is more valuable than the Moodle lessons-type feature that shows the questions after the video ends.

Table A2. Cont.

Question
Q7: The Retry feature, when used in H5P, was helpful to me.
Q8: Displaying the proper response after each question directs my path of comprehension.
Q9: I prefer converting all Moodle Lessons into H5P interactive videos.

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