Interactive H5P Framework-Based E-Learning Content in Artificial Intelligence Lectures of Indonesian Language and Literature

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Article Info

ABSTRACT

Purpose of the study: This study aims to develop interactive e-learning content based on the H5P framework in Indonesian Language and Literature Artificial Intelligence lectures at the Indonesian Literature Study Program, Faculty of Languages and Arts, Universitas Negeri Medan with the formulation of the problem of how the content development takes place and how the content is feasible.

Methodology: This study uses the Research and Development method with the ADDIE model research procedure (Analysis, Design, Development, Implementation, and Evaluation).

Main Findings: E-learning based on the H5P framework in Indonesian Language and Literature Artificial Intelligence lectures is very effective. Validation by media experts showed a very good assessment (89.58% for episode 1 and 97.91% for episode 2). Validation by material experts also showed similar results (93.18% for episode 1 and 97.72% for episode 2). The interactive content developed in the form of video podcasts was able to improve student understanding and engagement through interactive quizzes and simulations.

Novelty/Originality of this study: This study develops interactive learning content based on H5P in a new context, namely the Artificial Intelligence course for Indonesian Language and Literature.

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1. INTRODUCTION

In this era, the use of creative and innovative technology has begun to be developed in the preparation of media and learning content in lecture rooms [1], [2]. Therefore, many IT-based companies have begun to publish various applications and programs that can be accessed by university residents, both lecturers, educators, and students in supporting the lecture process on campus, related to various interactive e-learning content [3], [4]. Interactive comes from the word interaction, namely things that take action and influence each other. Interactive multimedia-based learning content is a good way to stimulate student knowledge, because it is definitely fun [5]-[7]. In line with that, Dwi Surjono stated that one way to increase motivation in using multimedia is to provide activities [8]. Therefore, learning multimedia must be interactive, so that it provides opportunities for students to be active [9], [10]. This article discusses the development of interactive-based e-learning content using the H5P framework in the Indonesian Language and Literature Artificial Intelligence course.

H5P is a framework or web work tool based on HTML 5 that facilitates its users with various interactive learning content, such as presentations, interactive videos, podcasts, quizzes, drag and drop, memory games, and so on [11]. Furthermore, H5P can be accessed for free by loading an open source and responsive system and can be integrated into a moodle-based e-learning platform [12]. In June 2018, the company's management announced that H5P had been financially supported by the Mozilla Foundation in the MOSS program [13]. In addition, there are currently four platforms that can be integrated with the H5P framework, namely Drupal, WordPress, Tiki, and Moodle [14].

So that its application is very easy, interesting, and also fun. In principle, this research is expected to bridge students' knowledge and competence in the four 21st century skills, namely creativity, critical thinking, communication, and collaboration in the Society 5.0 era [15]-[18]. The Artificial Intelligence Course in Indonesian Language and Literature is a new course in the current Merdeka Curriculum presented by the Indonesian Literature Study Program, Department of Indonesian Language and Literature, Faculty of Languages and Arts, Universitas Negeri Medan. As a new course that has good expectations for student competence in the field of developing digital products of Indonesian language and literature, it is deemed necessary to develop interactive-based e-learning content that can increase students' knowledge and scientific knowledge so that lectures in this course are more interesting and enjoyable. The Artificial Intelligence Indonesian Language and Literature course instills competence in students regarding knowledge about various multimedia applications or digital computing that can be used in the field of Indonesian language and literature.

Analysis of the need for interesting and enjoyable e-learning content in the Indonesian Language and Literature Artificial Intelligence course was conducted through a comprehensive interview with the head of the Indonesian Literature study program, Department of Indonesian Language and Literature, Faculty of Languages and Arts, Universitas Negeri Medan. As a content creator, the researcher is considered capable of developing interactive learning content that is expected to bridge students' knowledge and competence. Based on this rationale, this study developed interactive-based e-learning content in the form of video podcasts. The interactivity of the content is adjusted to the tools that are available in the H5P framework. The formulation of the problem formulation is how is the form of developing interactive-based e-learning content in the Indonesian Language and Literature Artificial Intelligence course using the H5P framework? and how is the feasibility of interactive-based e-learning content in the Indonesian Language and Literature Artificial Intelligence course using the H5P framework in the media and material expert validation test.

As a reference in this study, there are several previous studies that discuss the development of interactive content, namely the research of Siregar, Alfina Gustiany and Sembiring, Friscilla in 2022, entitled Interactive Learning Content Using H5P in Pronunciation Course, published in the Journal of Education, Humanities, and Social Sciences (JEHSS) volume 5 number 2, pages 1219-1225 [19]. Furthermore, the research of Utari, Dian Asa, Miftachudin et al in 2022 entitled *Pemanfaatan H5P dalam Pengembangan Media Pembelajaran Bahasa Online Interaktif* (Utilization of H5P in the Development of Interactive Online Language Learning Media), published in Metalingua Journal of Indonesian Language and Literature Education, volume 7 number 1, pages 63-69 [20]. Interactive content supported by H5P allows students to actively participate through quizzes, interactive videos, educational games, and simulations. This increases student motivation and engagement, especially in understanding complex topics such as AI in the context of language. H5P allows flexible and adaptive presentation of materials. With interactive content, students can learn according to their own pace and level of understanding. This is especially relevant for AI materials that require a layered approach. H5P provides assessment features such as interactive quizzes, so students can directly measure their understanding of the material [21], [22]. This is in line with the competency-based learning approach that requires students to master practical skills, not just theory. In online or hybrid learning conditions, frameworks such as H5P provide a practical solution to create a rich, dynamic, and interactive learning experience, compared to passive learning methods (such as PDF files or regular videos) [23]-[26].

Indonesian Language and Literature students can develop technological skills through the introduction of platforms such as H5P, which will later be relevant in various industrial applications, such as digital content creation or language-based application development. In the era of industry 4.0 and towards 5.0, AI and other technologies have an important role in various fields, including linguistics and literature [27], [28]. H5P-based content not only helps students understand AI, but also prepares them to face future challenges [29]-[31]. With these benefits, interactive e-learning based on H5P is the right medium to support AI learning in Indonesian Language and Literature, both in mastering the material, improving technological skills, and preparing students for the world of work that increasingly integrates AI. Therefore, this study aims to develop interactive e-learning content based on the H5P framework in Indonesian Language and Literature Artificial Intelligence lectures at the Indonesian Literature Study Program, Faculty of Languages and Arts, Universitas Negeri Medan.

In the context of learning the Artificial Intelligence course in Indonesian Language and Literature, technology-based interactive learning still faces challenges in terms of student engagement and the effectiveness of delivering complex materials. The H5P framework, which offers interactive features such as quizzes, interactive videos, and simulations, has great potential to improve the quality of learning. However, the

utilization of this framework in the context of this course has not been optimally implemented. Most of the available e-learning content is still linear and less interactive, so it does not fully support the development of student competencies in understanding the concept of artificial intelligence in the field of Indonesian Language and Literature. This GAP is the main reason for the need for research to develop more relevant and interesting interactive learning solutions. The urgency of this research is driven by the urgent need for innovation in learning that is able to adapt to the development of digital technology. Interactive learning based on the H5P framework offers a new approach to creating a more interesting, motivating, and effective learning experience. By providing content specifically designed for the Artificial Intelligence course in Indonesian Language and Literature, students can more easily understand abstract materials through simulations, interactive exercises, and technology-based evaluations. This study aims to answer these challenges by developing innovative and integrated e-learning content. The purpose of this study is to develop interactive e-learning content based on the H5P framework that can increase student engagement, support understanding of artificial intelligence concepts, and optimize learning in the Indonesian Language and Literature Artificial Intelligence course. In addition, this study also aims to evaluate the effectiveness of the content in improving student learning outcomes and obtain input for product improvement.

2.   RESEARCH METHOD

This research uses the R&D (Research and Development) development method with the ADDIE model of analysis, design, development, implementation, and evaluation developed by Dick and Carry in 1996 [32]-[35].

The sample of this study was selected using purposive sampling technique, considering certain criteria to ensure the relevance and accuracy of the research results. The sample consists of: Students of Artificial Intelligence Course of Indonesian Language and Literature, The main sample in this study were students who were taking the Artificial Intelligence course in the Indonesian Language and Literature study program. Number: 30–40 students as the main users. Criteria: Registered in the course during the research semester, Have access to a digital device (laptop or smartphone) to access e-learning content, Willing to participate in all stages of the research, from trials to data collection.

Analysis

At this stage, a needs analysis is conducted to understand the context, characteristics, and needs of users. Activities at this stage include: 1) Learning needs analysis: Identifying learning objectives, relevant materials, and competencies that must be achieved in the course; 2) Student characteristics analysis: Knowing the initial level of understanding, learning preferences, and accessibility to technology; 3) Technology analysis: Assessing the ability of the H5P framework to support the development of interactive content that is appropriate for the course; 4) Final result: Needs analysis document that is the basis for development.

Design

At this stage, interactive e-learning content based on H5P is designed according to the analysis results. Activities at this stage include: 1) Designing learning structures: Developing learning modules that include introductions, core materials, interactive exercises, and evaluations; 2) Designing interactive learning media: Designing quizzes, simulations, interactive videos, and H5P-based exercises; 3) Developing learning scenarios: Creating learning flows that support student interactivity; 4) Final results: Storyboards, content designs, and technical designs for interactive media.

Development

This stage focuses on developing content based on the design that has been created. Activities include: 1) Creating e-learning content: Developing content using the H5P framework, such as interactive video, course presentation, drag-and-drop, and quizzes; 2) Involving material and media experts: Validating content by experts in the field of Indonesian Language and Literature Artificial Intelligence and learning media experts; 3) Internal testing: Conducting initial testing (alpha testing) to ensure the content functions according to the design; 4) Final result: Interactive e-learning content based on H5P in the form of a prototype.

Implementation

At this stage, the developed content is tested on students. Activities include: 1) Beta testing: Implementing the content to a group of students in a course. Data collection: Using instruments such as questionnaires, interviews, and observations to evaluate user experience; 2) Final results: Implementation report and user feedback.

Evaluation

This stage aims to assess the success and effectiveness of e-learning content. Evaluation is carried out formatively and summatively: 1) Formative evaluation: Carried out during the development process (at the design, development, and implementation stages); 2) Summative evaluation: Carried out after implementation to assess student learning outcomes and the effectiveness of interactive content; 3) Final result: Evaluation report containing recommendations for content improvement.
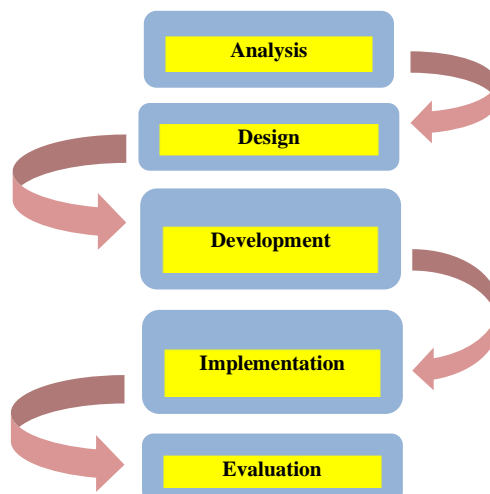

Figure 1. ADDIE Development Model

Table 1. Media Validation Indicators

Aspect	Indicator
Audio and Visual	Video display quality
	Audio quality in video
	Suitability of language selection to content
	Accuracy of voice usage
	The attractiveness of video content
Media	Suitability of duration to learning
	The interestingness of the video flow
	Ease of media access
Benefit	Facilitate the learning understanding process
	Can be used anytime and anywhere
	Independence in media use
	Clarity of material

3.　RESULTS AND DICUSSION

The results of the research in the form of interactive e-learning content development are two podcast videos. The following are the stages of development.

Analysis Stage

The target users in the development of this research product are sixth semester students of the Indonesian Literature study program, Department of Indonesian Language and Literature, Faculty of Indonesian Language and Literature, Universitas Negeri Medan. Based on the results of the interviews conducted, it was shown that they needed interesting and fun interactive learning content, considering that the Indonesian Language and Literature Artificial Intelligence course is a new course.

Design Stage

The next stage is the design of interactive e-learning content using the H5P framework. H5P is an open source framework based on JavaScript, making it easy for users to create/develop learning content and share it. Here is the design display.
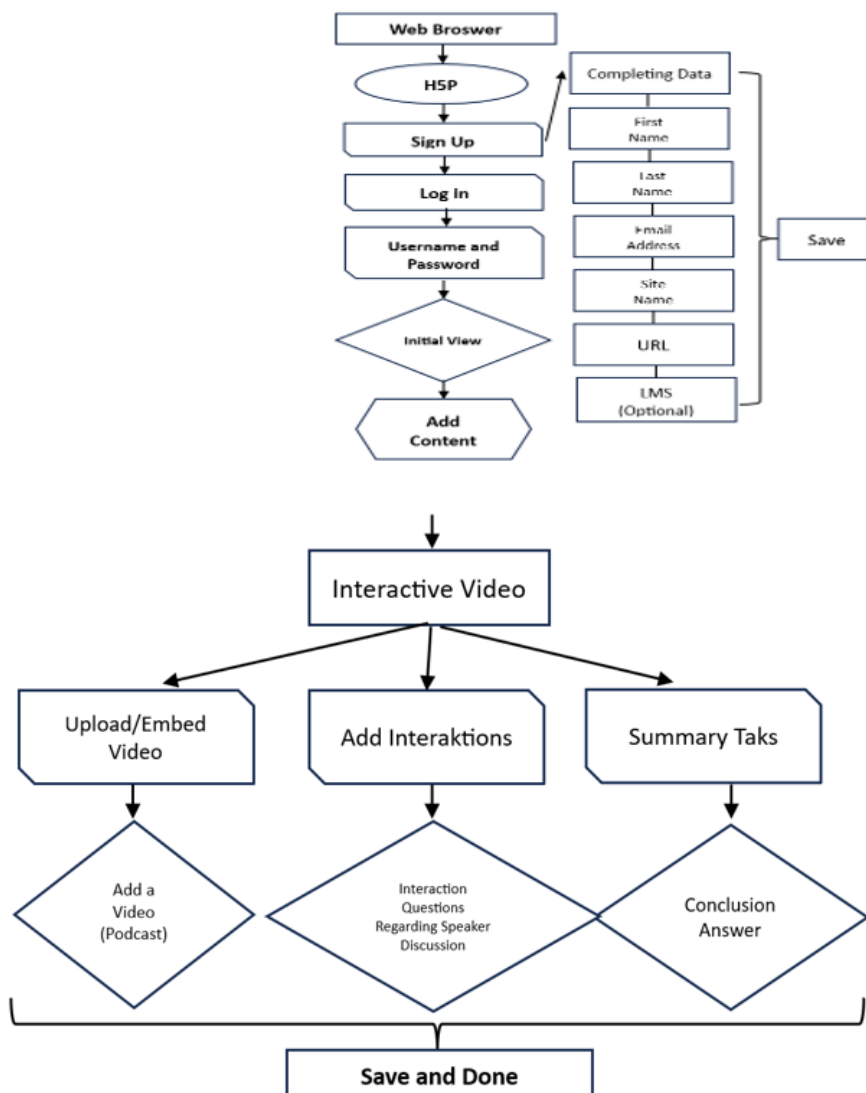
Figure 2. E-Learning Content Development Design

Development Stage

This stage is carried out by developing interactive e-learning content using the H5P framework through the web base plug-in. Its creation is of course adjusted to the design of the plan. First, the researcher collected material taken from discussions with lecturers in charge of the course and digital literature studies, namely, Google and YouTube.

The first episode brought in and interviewed a resource person in the IT field as well as a lecturer at the Informatics and Computer Technology Education Study Program, Faculty of Engineering, State University of Medan, namely Bagoes Maulana, S.Kom., M.Kom. Then in the second episode, the same resource person discussed the Application of Artificial Intelligence programs that are correlated in the fields of Language and Literature, namely Chat GPT and Copy.AI. The form of the video podcast display that has been published on the PapaBiyya Production YouTube channel. PapaBiyya Production is a YouTube channel account owned by researcher Muhammad Anggie Januarsyah Daulay. which currently has around 2000 subscribers. The form of the video podcast display episodes 1 and 2 on the PapaBiyya Production YouTube channel.
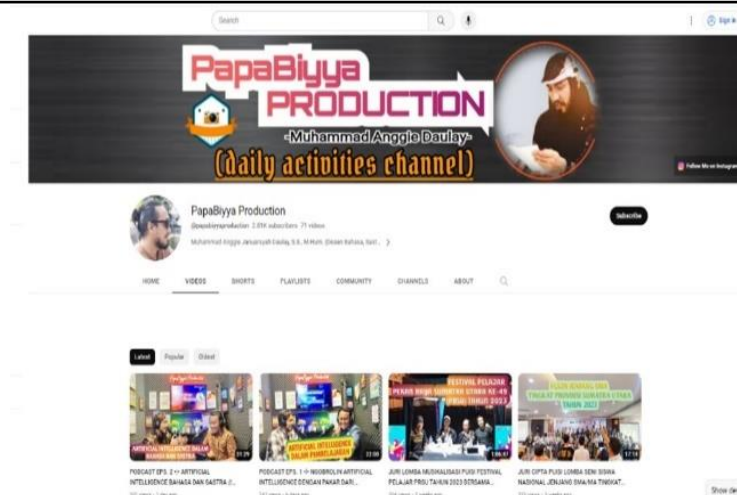
Figure 3. PapaBiyya Production Youtube Channel Account

Next, we will describe the interactive e-learning content development display based on the H5P framework below.

a. Interactive Video Display (Podcast)

1) Upload/Embed Video

Before developing the content, the researcher filmed a podcast with a resource person with an IT education background from Medan State University, namely Bagoes Maulana, S.Kom., M.Kom. The reason for determining the resource person was based on his expertise in the field of computer technology information, plus the resource person completed strata 1 and 2 in the computer field. The filming location was at PapaBiyya Studio, Jalan Menteng Indah Blok C2 Number 9 Medan Denai. After the filming was completed, the footage was edited until it became a complete video. Episode 1 is 22 minutes long and episode 2 is 31 minutes long.

In the first episode, the topics discussed were around Artificial Intelligence including the concept of Artificial Intelligence, the history of the development of Artificial Intelligence in the world and in universities, the inventor of Artificial Intelligence and the impact of the use of Artificial Intelligence on the world of work and students. Next, in the second episode, the substance of the discussion is focused on two Artificial Intelligence programs that are directly correlated to the field of Indonesian Language and Literature, namely Chat GPT and Copy.AI. The following is a display of video uploads on the H5P framework episodes 1 and 2.
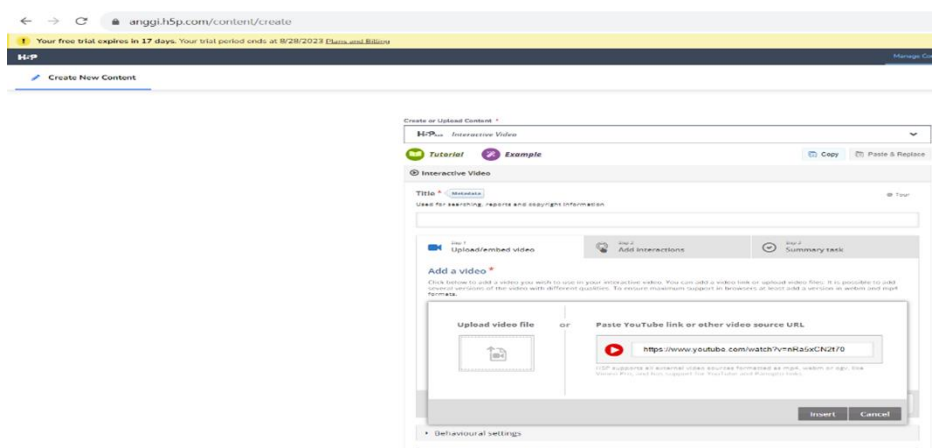

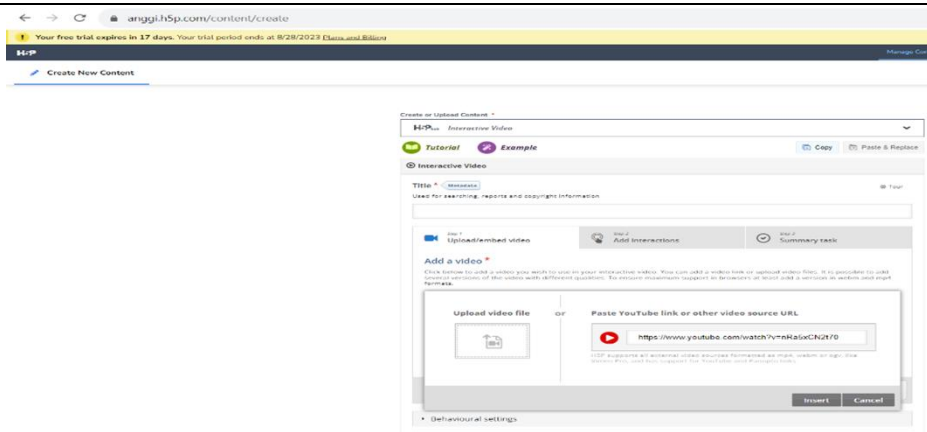Figure 4. Video Upload Episode 1 View

Figure 5. Video Upload Episode 2 View

2) Add Interactions

This stage is to create questions and set the duration of the questions that will appear on the H5P framework display. The interactivity of the content lies in the listening process carried out by students to the discussion between the researcher and the resource person from the beginning to the end of the video [36]. The finger symbol that will appear contains direct questions for students to answer by clicking on it. There are two answer choices, if the question is correct, the system will show a green line, while if the answer is wrong, a red line will appear. The questions given in this video podcast episode 1 are six questions. While the questions given in the video podcast episode 2 are 17 questions. This is done so that student competence is maximized by watching from the beginning to the end of the video.

The questions that have been compiled are then set for duration by setting the minutes in which the questions come out. Of course, this must be adjusted to the substance of the discussion between the researcher and the resource person. In episode 1, the interactive questions from the discussion were about the concept of Artificial Intelligence, what is the history of the development of Artificial Intelligence, what year Artificial Intelligence entered Indonesia and how has it developed in higher education, who invented Artificial Intelligence according to the book read by the resource person, what are the positive and negative impacts of Artificial Intelligence on the world of work and students.

In episode 2, 17 questions were compiled covering what the Chat GPT application is like, what year the Chat GPT application was launched to the public, how the Chat GPT application has developed, how to run the Chat GPT application, how to subscribe to the Chat GPT application, what are the payment time options for the Chat GPT application subscription, how to run the Chat GPT application, what are the benefits of the Chat GPT application for students, can the Chat GPT application be used in the field of writing such as poetry, can the Chat GPT application also create short stories and novels, are there other programs on AI related to Language and Literature, what is the Copy.AI application like, how does the Copy.AI application work, what are the stages of using the Copy.AI application, how is the Copy.AI application related to the field of language and literature, can the Copy.AI application help with writing poetry, The seventeen questions compiled were of course based on discussions conducted by researchers with sources in the podcast. The reason for choosing two types of Artificial Intelligence programs, namely Chat GPT and Copy.AI, is based on their connection to the fields of language and literature, which are very concretely correlated to the competencies of the courses that have been prepared in the Semester Learning Plan (RPS) [37] [38]. Here is the display.
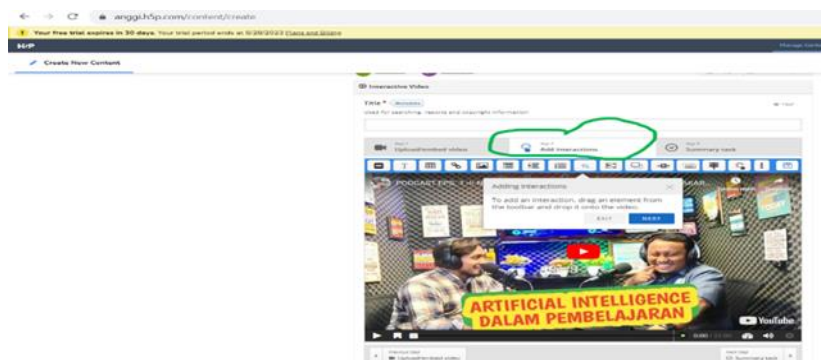

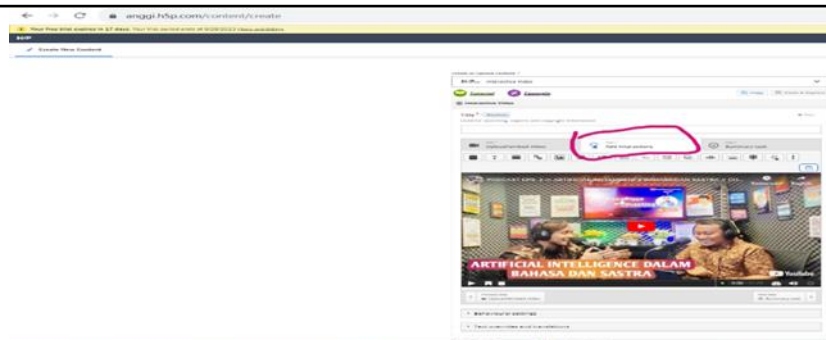Figure 6. Add Interactions Video Podcast Episode 1

Figure 7. Add Interactions Video Podcast Episode 2

3) Summary Task

Summary task is the final stage of interactive video development on the H5P framework before it is published and ready to use. Basically, this stage contains the conclusion of all questions [39] [40]. For example, questions that have been previously arranged based on their minutes will reappear as a reinforcement of memory for questions that have been answered. After all questions have been answered, the final score obtained will appear and a brief comment from the content developer. Then the word continue will appear, click and all processes are complete.
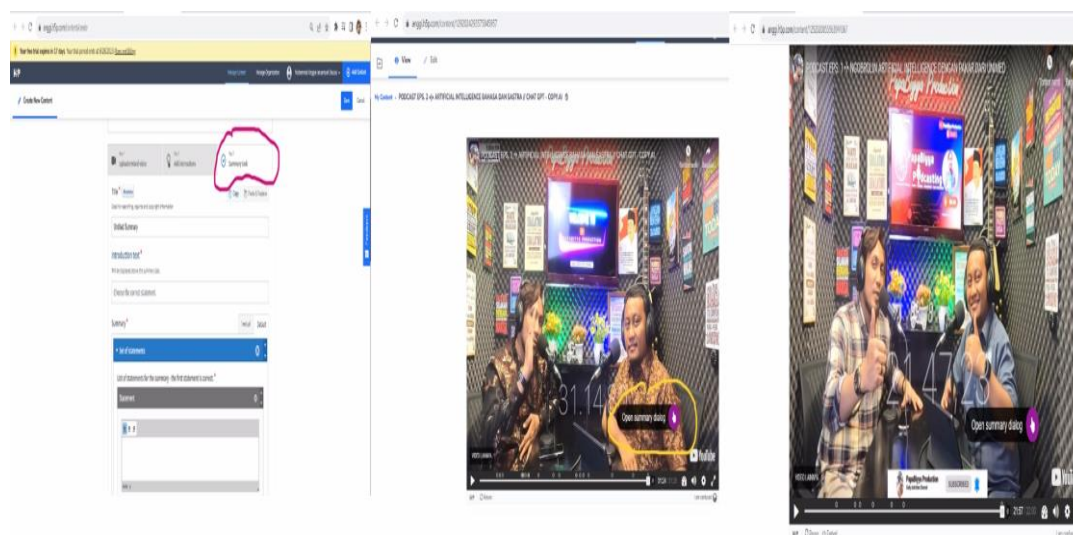

Figure 8. Summary Task Video Podcast Episode 1 and 2

Implementation Stage

The implementation stage is a trial of the e-learning content that has been developed to a number of respondents, namely sixth semester students of the Indonesian Literature study program who contract the Artificial Intelligence course in Indonesian Language and Literature. However, before the e-learning content was used, the researcher asked two experts, namely media experts and material experts to provide an assessment of the e-learning content product that had been developed.

Media Expert Assessment Results

Media experts are respondents who are tasked with validating a learning media. This e-learning content was tested by media experts who understand software systems, audio-visual communication, and media. The following are media validation indicators and media assessment results by experts. Based on the assessment questionnaire for the two media contents above, media experts gave a very good assessment for both, in episode 1 with a value of 89.58% and in episode 2 with a value of 97.91%. So it can be concluded that the e-learning content that has been developed is very suitable for use in supporting learning in the Artificial Intelligence course of Indonesian Language and Literature.

Results of Material Expert Assessment

Material experts are respondents who test the feasibility of the material perspective on learning content. The following are material validation indicators and material assessment results by experts. Based on the assessment questionnaire for the two content materials above, the material expert gave a very good assessment

for both, in episode 1 with a value of 93.18% and in episode 2 with a value of 97.72%. So it can be concluded that the e-learning content that has been developed is very suitable for use in supporting learning in the Artificial Intelligence course of Indonesian Language and Literature.

Table 2. Media Expert Assessment Results

Episode	Audio & Visual (%)	Media (%)	Benefits (%)	Average (%)	Category
1	89	92	88	89.58	Very Good
2	87	100	98	97.91	Very Good

Table 3. Material Expert Assessment Results

Episode	Self-Instruction (%)	Self-Contained (%)	Stand-Alone (%)	Adaptive (%)	User-Friendly (%)	Mean (%)	Category
1	83	100	87	100	100	93.18	Very Good
2	100	100	88	100	100	97.72	Very Good

The results in Table 1 summarize the evaluation of the e-learning videos by media experts for Episodes 1 and 2. The assessment focuses on three main aspects: Audio and Visual, Media, and Benefits. For Episode 1, the overall average score was 89.58%, categorized as Very Good. The video's audio and visual quality (e.g., video display quality and audio clarity) were rated highly, with some areas like language appropriateness and content attractiveness achieving slightly lower scores of Good. The media aspect, including the suitability of the video's duration and storyline flow, received strong ratings, showing its alignment with learning needs. The benefits aspect demonstrated the video's effectiveness in aiding comprehension and providing flexibility, although improvements in material clarity and independence were noted. For Episode 2, the overall average score was even higher at 97.91%, also categorized as Very Good. All aspects were rated higher compared to Episode 1, with most indicators receiving a Very Good rating. This indicates that Episode 2 has improved content structure and presentation, making it even more effective in supporting the learning process.

Table 2 highlights the evaluation by material experts, focusing on five key aspects: Self-Instruction, Self-Contained, Stand-Alone, Adaptive, and User-Friendly. For Episode 1, the overall average score was 93.18%, categorized as Very Good. The Self-Instruction aspect, which measures how easy the material is to understand and its ability to encourage independent learning, received a Good rating in some indicators, such as motivating students to seek additional resources. Meanwhile, Self-Contained and Adaptive aspects were rated Very Good, indicating the content is aligned with learning objectives, supports blended learning, and remains relevant to technological developments. Additionally, the material was rated as User-Friendly, with easy access and supporting features that enhance understanding. For Episode 2, the overall average score was 97.72%, also categorized as Very Good. Improvements were evident in all aspects, especially Self-Instruction, where all indicators achieved Very Good ratings. This reflects significant enhancements in motivating independent learning and ensuring the material is engaging. The high ratings across all categories highlight the strong alignment between the video content and the educational objectives, as well as the seamless integration of technology to support learning.

The study found that the development of H5P-based interactive e-learning content for the Artificial Intelligence course in Indonesian Language and Literature was highly effective. Media validation results showed excellent ratings, with 89.58% for episode 1 and 97.91% for episode 2, while material validation results were similarly outstanding, with 93.18% for episode 1 and 97.72% for episode 2. The content, consisting of interactive video podcasts, successfully enhanced student engagement and understanding through features such as interactive quizzes and simulations.

The novelty of this research lies in its focus on developing interactive e-learning content tailored specifically for a new Artificial Intelligence course in the field of language and literature. By incorporating AI tools like ChatGPT and Copy.AI, the study provided a concrete application of artificial intelligence in these disciplines. Furthermore, the integration of H5P features such as interactive questions and time-based evaluations introduced a dynamic and adaptive learning approach, surpassing traditional teaching methods. This research has significant implications for education in the era of Industry 5.0. The H5P-based content not only motivates and engages students but also equips them with technological and AI-related skills that are increasingly essential in the modern workforce. By bridging abstract AI concepts with practical applications, the content enhances students' readiness to tackle real-world challenges in language and literature fields.

However, the study has several limitations. It was conducted within a single institution, Universitas Negeri Medan, and involved students from only one academic program, limiting the generalizability of the findings. Additionally, the research focused exclusively on two AI tools, ChatGPT and Copy.AI, without exploring other potential AI applications. The study also did not compare H5P with other interactive learning platforms to assess its relative advantages.

Future research should expand the scope to include other institutions and programs to enhance the generalizability of the results. Comparative studies between different e-learning platforms are also recommended to measure the relative effectiveness of H5P. Moreover, the exploration of additional AI tools relevant to language and literature could provide broader insights into the integration of AI in education. In practical implementation, the development of more advanced H5P features, such as educational games or extended simulations, could further enrich the learning experience. Providing downloadable video content would improve accessibility for students, especially those with limited internet access. Lastly, training sessions for both instructors and students on utilizing the full potential of H5P could ensure the maximum benefit of this innovative learning platform.

Evaluation Stage

Evaluation is conducted in order to improve the e-learning content that has been developed using the H5P framework. The suggestions and criticisms from the two experts regarding the visual perspective are as follows.

Table 4. Expert Evaluation of E-Learning Content

Aspect	Suggestion	Improvements to the Application
Visual	The display design needs to be made into a layered photo so that students can understand it better.	Researchers have designed layer photos on the program display being discussed so that students can better understand the Artificial Intelligence program being discussed.
	It would be good if the videos contained in the content could be downloaded by students.	The researcher has included a video download link.

4. CONCLUSION

The conclusion of this study is described as follows. Media development using the ADDIE model begins with a needs analysis of e-learning content related to the Artificial Intelligence Indonesian Language and Literature course as a new course in responding to the Era Society 5.0 in the Indonesian Literature Study Program. In answering this, the next step is to develop e-learning content using the H5P framework which begins with creating a content design that contains steps, features/tools, and display forms. The interactive-based learning content developed is a two-episode video podcast, the first episode entitled Ngobrolin Artificial Intelligence dengan Pakar dari Unimed with a duration of 22 minutes, and the second episode entitled Artificial Intelligence Bahasa dan Sastra Chat GPT – Copy.AI with a duration of 31 minutes, Material and media experts gave very good assessments for both interactive video content (podcasts) that had been developed through the H5P device. In episode 1, the media expert gave an assessment of 89.58% and in episode 2 it was 97.91%. Furthermore, the material expert gave an assessment of 93.18% in episode 1 and 97.72% in episode 2. So it can be concluded that the e-learning content that has been developed is very suitable for use in supporting learning in the Artificial Intelligence course of Indonesian Language and Literature.

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