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Development of H5P Course Presentation to Improve Student Mathematics Learning Outcomes

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ABSTRACT

Educators are the people who are responsible for all educational processes, so it would be better if learning plans were designed before the implementation took place so that student learning outcomes could be optimized. One of the things that needs to be prepared is learning media. The selected learning media must be able to convey the content of the learning material, either in the form of videos, slides, images, or graphics. Course Presentation is an interactive media in the form of slides that can be filled with videos and interactive quizzes equipped with adaptive feedback. This type of research is in the form of R&D with the ADDIE model, which aims to develop Course Presentation as a learning medium that improves students' mathematics learning outcomes. This research took place in class 9F SMPN 2 Sumber, totaling 32 students. The study results showed that Course Presentation was suitable for learning mathematics through an expert validity test analyzed using the V-Aiken formula. The validity of the material was 0.86 with a valid category, and the media validity result was 0.76 with a valid category. In addition to the feasibility of the media, this study also tested Course Presentation to improve students' mathematics learning outcomes; through the Normalized Gain test, students' mathematics learning outcomes increased by 0.5 with the medium category. From this data, it can be concluded that Course Presentation can be used as a learning medium to improve students' mathematics learning outcomes.

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1. INTRODUCTION

The rapid development of technology has many influences on the world of education. Therefore, education must be able to utilize technology to help the learning process [1]. Agustini Buchari explained that educators are responsible for all educational processes; it would be better if learning plans regarding materials, methods, and learning media were designed before the implementation [2]. It is familiar to students if they consider

mathematics challenging and tedious to understand [3]. One of the aspects that affects this is the presentation of still conventional material [4]. The decline in mathematics learning outcomes is due to many factors, one of which is that teachers still use monotonous methods and rarely use learning media [5].

Learning media has various features, so teaching and learning activities can create a different learning atmosphere. Lestari explained that interactive multimedia can improve student learning outcomes [6]. One of the innovations that the researcher suggests is Course Presentation H5P, interactive content in the form of slides containing interactive videos and quizzes with output in the form of links, making it easier for students to use it with one tap to observe the learning content provided, besides that the material content can be designed according to the teacher's wishes so that the information provided will be right on target [7].

The learning process needs to be upgraded in the digital era so it does not lag [8]. According to the researcher's observation results by distributing a questionnaire on using gadgets at SMPN 2 Sumber to 116 students, 99% of students have a mobile phone. The most extended duration of gadget use is 5 to 10 hours, with a percentage of 56%. They use it for online games 19%, learning 5%, information 20%, and other activities 56%. Meanwhile, the applications often used are Google and Webtoon 1%, Wattpad 2%, YouTube 3%, Instagram 9%, WhatsApp 23%, and TikTok 54%. This data means that 99% of SMPN 2 Sumber students have gadgets not used for learning. According to the results of the researcher's interview with SMPN 2 Sumber teachers, the policy of using gadgets in the school cannot be implemented because there is a risk of losing students' focus on learning.

Students ' loss of focus can be caused by a monotonous learning atmosphere [9]. Course Presentation has segmentation features and interactive quizzes that can distract students so that they remain engaged in the learning process. Previous researchers said using videos in learning will be meaningful if the video lasts approximately 6 minutes [10]. Meanwhile, the teaching and learning process takes more than 6 minutes, so it requires media that can combine content with different dimensional features so that students can interact with media from one dimension to another [11]. In addition, Course Presentation also has an interactive quiz feature that can restore students' focus on learning. The existence of interactive quizzes forces students to work on questions that appear to continue with the following content [12].

Previous research developed interactive PowerPoint as a learning medium; the study explained that interactive PowerPoint succeeded in improving student learning outcomes. However, PowerPoint could not accommodate large-capable videos, so the quality became less clear [13]. Research by Setiyana & Kusuma explains that YouTube can be a learning medium to improve students' mathematics learning outcomes. Still, it results in students becoming passive because there is no reciprocal relationship between students and the media [14]. Furthermore, research by Biassari et al. uses interactive videos that make students active in learning because of the interchange between media and users; his study also explains that interactive videos can improve students' mathematics learning outcomes [15]. However, using videos as a learning medium can be optimal if it lasts approximately 6 minutes [16].

From some of the studies above, the researcher proposed the Course Presentation solution as a complement to the previous learning media because Course Presentation can accommodate large-capacity videos with clear video quality and has interactive features so that there is reciprocity between users and media. There is a segmentation feature to separate several interactive videos so that students have a break to rest and move on to the next video in one link [17]. Given the advantages of Course Presentation, researchers are interested in developing It as a learning medium to improve students' mathematics learning outcomes.

2. THE THEORETICAL BASIS

HTML Five Package (H5P) is a hypermedia-based online learning media (Hypertext and Multimedia) because there are images, sounds, videos, or multimedia along with hyperlinks to make it easier for users to get other information; H5P can be used through a mobile phone, computer, or similar tool to create, share, and reuse interactive content that can be linked to an LMS (Canva, Blackboard, Moodle, WordPress, and drupal) [18], [19]. Interactive video is an interactive media that can be used for learning by combining audio, motion, images, text, or graphics; in video, there is a reciprocal relationship between the media and the user [20]. Course Presentation is one of H5P's interactive content with a slide display that can be filled with multimedia, text, and various types of interactive such as material summaries and multiple choices, and interactive videos, where quizzes conducted by users can display adaptive feedback [7]. The advantage of a Course Presentation is that the slides can be filled with several interactive videos, do not require memory capacity, and are practical because they can be shared with students via a link [17].

3. METHOD

The type of research used is R&D (Research and Development) because it can be used to develop specific products [21]. The product developed in this study is the H5P Course Presentation. The development model used, namely the ADDIE development model, includes five stages: Analysis, Design, Development, Implementation, and Evaluation [22]. The researcher conducted a material and media validity test on three expert judgments to determine the product's feasibility [23]. This study's subject is class 9F SMPN 2 Sumber, which has 32 students. The expert validation questionnaire was used to test the feasibility of the media. The researcher used a test sheet to measure the improvement of students' mathematics learning outcomes.

The validity test of media and materials was analyzed using the V-Aiken formula with Excel software [24].

$$V = \frac{\sum S}{n(c-1)} \quad (1)$$

Description:

V = Aiken index
S = R – LO = The score given by the expert is minus the lowest category score
R = Score given by experts
LO = Lowest category score

c = Highest category score
n = Total validity

After the researcher analyzed it according to the formula above, it was categorized in the V-Aiken category table [25].

Table 1. V-Aiken Category

Index Validity	Category
0,71 – 1,00	Valid
0,31 – 0,70	Medium
0,00 – 0,30	Low

Pretest and posttest data were analyzed using the N-Gain formula to measure the improvement of students' mathematics learning outcomes [26].

$$g = \frac{score\ posttest - score\ pretest}{score\ ideal - score\ pretest} \quad (2)$$

After obtaining the gain value, the researcher adjusts it to the Normalized Gain category table [26].

Table 2. Normalized Gain Category

Normalized Gain Score	Category
$g > 0{,}7$	High
$0{,}3 \leq g \leq 0{,}7$	Medium
$g < 0{,}3$	Low

4. RESULTS AND DISCUSSION

The stages of ADDIE research (Analysis, Design, Development, Implementation, and Evaluation) are carried out by the definition described in Cahyadi [27].

4.1. Analysis

Course Presentation was developed as a learning medium because researchers made observations by distributing a questionnaire on using gadgets at SMPN 2 Sumber. It was obtained that 99% of SMPN 2 Sumber students have gadgets. This is by Course Presentation, which can be used for various types of gadgets, from gadgets to computers. The researcher also interviewed a mathematics teacher at SMPN 2 Source, obtaining information that they still use conventional methods when carrying out teaching and learning activities. So, Course Presentation can be used as a breakthrough mathematics learning media at SMPN 2 Sumber, especially class 9F SMPN 2 Sumber.

4.2. Design

At the design stage, researchers design media and research instruments. The material in the media is adapted to the ongoing material and the curriculum that applies at SMPN 2 Sumber. The applicable curriculum is the 2013 Curriculum, and the material used is "Reflection on Geometric Transformations". Next, the researcher collected the required elements from the theme and background and created a storyboard Course Presentation.

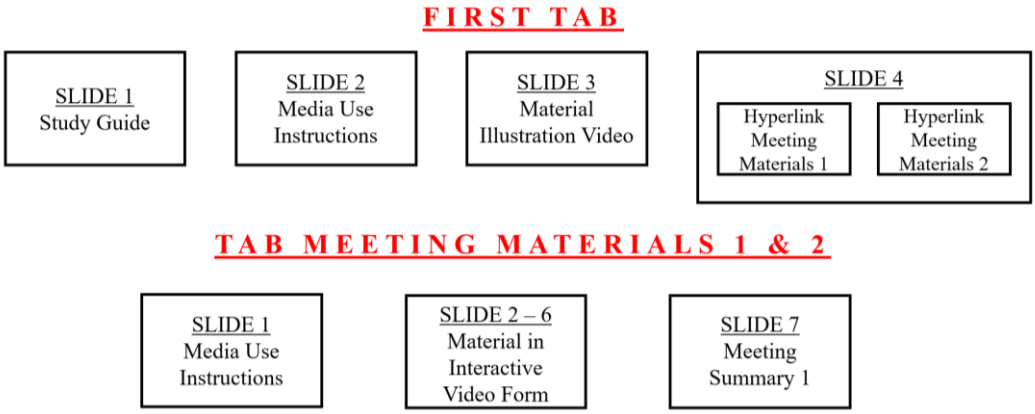

Figure 1. Story Board Course Presentation

4.3. Development

At this stage, the researcher makes a Course Presentation, starting by creating material using Microsoft PowerPoint.

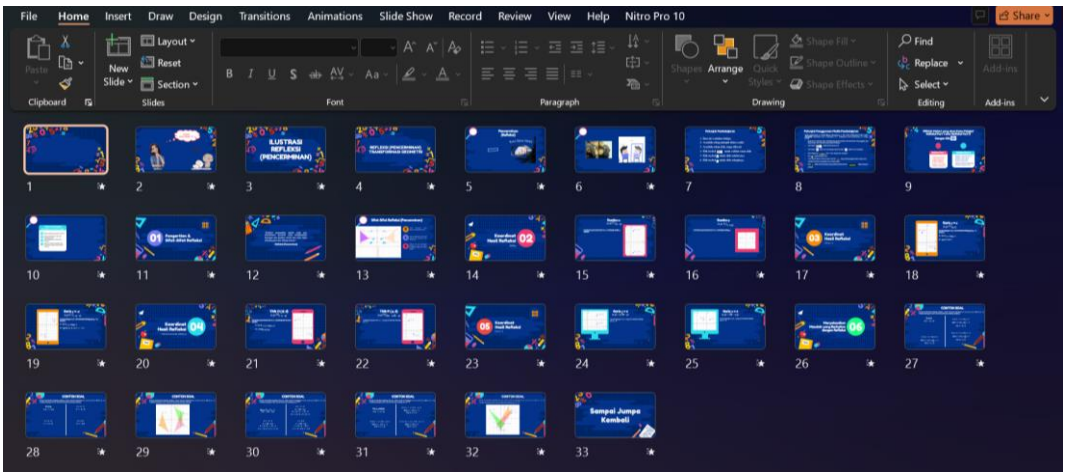

Figure 2. Material Design

The next step is to create a video with a screen recorder and voiceover using the Movavi Screen Recorder 9 application. Then, the researchers edited the footage using YouCut and uploaded it to YouTube. After successfully uploading the video to YouTube, the researcher copied the link. The next step is for the researcher to log in to the H5P account (http://h5p.com/) and select the Course Presentation content. Then, make a Course Presentation according to the storyboard. Once you've finished saving the content, the Course Presentation can be shared directly with students. However, H5P content is limited

to 30 days; if the content does not want to be lost, we must copy the H5P content link to the LMS. In this study, the researcher used WordPress so that the content could be used many times without being limited by time. The following are the results of the Course Presentation made by the researcher: https://info.etunas.com/2024/02/05/refleksi-transformasi-geometri-matematika-kelas-9-kurikulum-2013/.

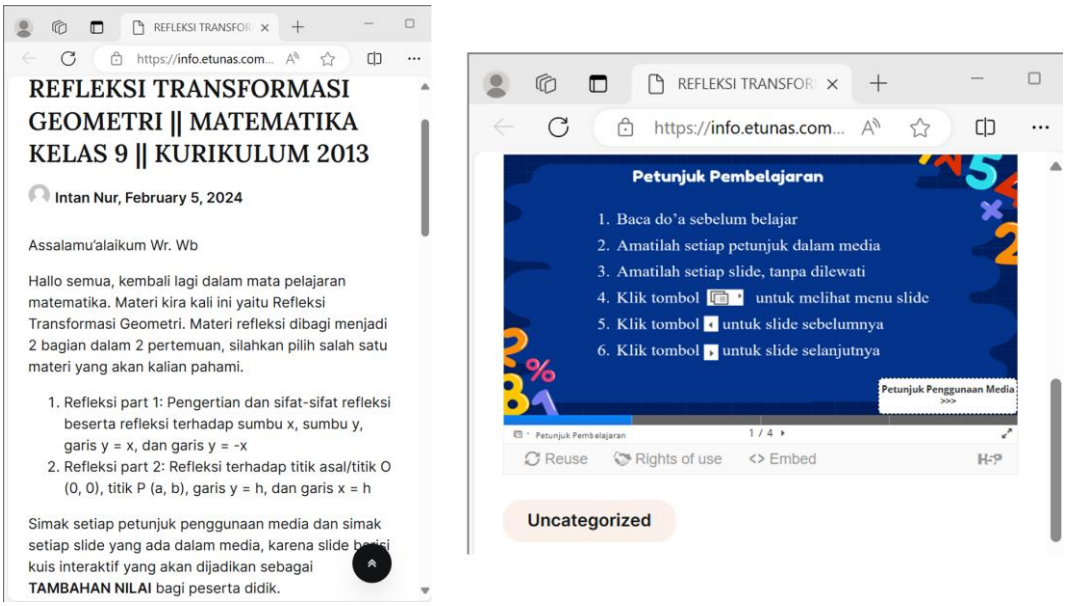

Figure 3. First Tab

4.4. Implementation

At the implementation stage, researchers collected data by validating the media and material with three judgment experts. The researcher also conducted research in class 9F of SMPN 2 Sumber, totaling 32 students. The first meeting conducted a pretest and explained what and how teaching and learning activities use Course Presentations to students. The next meeting carried out teaching and learning activities using Course Presentations. The researcher shared the Course Presentation link via the WhatsApp group during the learning process. The researcher gave students time to watch the video and answer the interactive quiz that appeared. At the end of the video, researchers always ask students questions regarding the videos they have watched. Researchers did this to ensure that students directly listened to the learning content provided. At the last meeting, a posttest was carried out.

4.5. Evaluation

The evaluation stage was carried out to assess whether Course Presentation is suitable as a learning medium for improving students' mathematics learning outcomes. The researcher analyzed the data collection results, starting from the expert validity test to assess the feasibility of the media and analyzing the pretest and post-test to find out the difference in students' mathematics learning outcomes before and after using the Course Presentation.

The media and materials validity test was conducted by three expert judgments: two mathematics lecturers from IAIN Syekh Nurjati and one mathematics teacher from SMPN 2 Source. The following are the results of the analysis of media feasibility test data:

Table 3. Media Feasibility

No	Aspect	Score			V-Aiken	Category
		Expert I	Expert II	Expert III		
1	Display Quality	27	26	27	0,78	Valid
2	Technical Quality	30	30	29	0,76	Valid
Sum			169		0,76	Valid

The results of the data recapitulation in Table 3 Were analyzed using the V-Aiken formula and Excel software. The data explains that Course Presentations can be used as a mathematics learning medium, with an overall V-Aiken score of 0,76.

In addition to the feasibility of the media, the researcher also tested the feasibility of the material used in the Course Presentation. The following are the results of the analysis of material feasibility test data:

Table 4. Material Feasibility

No	Aspect	Score			V-Aiken	Category
		Expert I	Expert II	Expert III		
1	Content	28	26	24	0,90	Valid
2	Presentation	13	12	12	0,88	Valid
3	Language	33	28	28	0,87	Valid
Sum			204		0,86	Valid

The data in Table 4 Explains that the material used by the researcher as the content in the Course Presentation is appropriate in terms of content, presentation, and language used to explain the learning material. The suitability of the material used was proven valid with a V-Aiken value of 0.86.

In addition to testing the feasibility of materials and media, this research was also conducted to analyze Course Presentations in improving students' mathematics learning outcomes. Data to measure students' mathematics learning outcomes used test sheets distributed to 32 students. The test before the Course Presentation treatment is called the Pretest, while the test after the Course Presentation treatment is called the Posttest. The following is a recapitulation of student mathematics learning outcome data:

Table 5. Recapitulation of Students' Mathematics Learning Results

	N	Minimum	Maximum	Mean
N-Gain Score	32	0,3	1	0,5
Pretest	32	9	42	23,4
Posttest	32	21	55	39,2

The data in Table 5 show that the average student mathematics learning outcome before the Course Presentation was 23.4. After researchers used Course Presentation as a

learning medium, the average student mathematics learning outcome increased by 39.2. Through normalized gain analysis with the help of SPSS, an average N-Gain value for students' mathematics learning outcomes was obtained at 0.5. This data means that students' mathematics learning outcomes increased after using Course Presentation as a learning medium.

The data of this study proves Arsyad's statement regarding the maximum use of learning media as media that can convey the content of learning materials in the form of videos, slides, images, graphics, etc [28]. This is by Course Presentation, which has a slide feature and can add videos, photos, and graphics. Research by Putri et al. explains that interactive learning media such as PowerPoint, videos, online quizzes, and the like can improve student learning outcomes [29]. The features of Course Presentation include a combination of PowerPoint, video, and interactive quizzes, with the data in Table 5 This proves that Course Presentation is an interactive learning medium that can improve students' mathematics learning outcomes. Research by Nopriansyah & Ismanuar explains that quizzes or interactive quizzes can improve students' mathematics learning outcomes [30]. This is by the Course Presentation feature, which allows interactive quizzes to be added to videos or slides. Course Presentation also has an adaptive feedback feature that can increase student understanding and participation in learning to improve student learning outcomes [31].

5. CONCLUSION

This research develops Course Presentation as a learning medium to improve student mathematics learning outcomes. Course Presentation is an interactive media in the form of slides that can be filled with videos and interactive quizzes equipped with adaptive feedback. After going through the ADDIE stage, research results were obtained, which stated that Course Presentation was worthy of being used as a learning medium with a material V-Aiken value of 0.86 and a media V-Aiken value of 0.76. This research also produces data that shows that Course Presentation can be used as a learning medium to increase student mathematics learning outcomes by 0.5 in the medium category.

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