

# Development of Interactive Video for the Basics of Educational Technology Course

Harfajri Nuari<sup>1\*</sup>, Zelhendri Zen<sup>1</sup>, Abna Hidayati<sup>1</sup>, Ridwan<sup>2</sup>

<sup>1</sup>Curriculum and Educational Technology Department, Universitas Negeri Padang, Padang, Indonesia.

<sup>2</sup>Electrical Engineering Department, Universitas Negeri Padang, Padang, Indonesia.

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Corresponding Author:

Harfajri Nuari

[harfajri.nuari08@gmail.com](mailto:harfajri.nuari08@gmail.com)

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**Abstract:** This study aims to evaluate the validity of the interactive video developed for the Basics of Education Technology course. This Research & Development (R&D) study adopts the ADDIE development model, commencing with the analysis and design phases. The subsequent step is the development phase, where data is collected through interviews and questionnaires. Data analysis is conducted to assess the validity of the interactive video across three aspects: content, media, and language. Validators provide both quantitative and qualitative feedback. The results of the validity test indicate a score of 93% from media experts, 85% from content experts, and 95% from language experts. This suggests that each aspect of the interactive video is deemed valid and falls within the highly valid category. Thus, it can be concluded that the interactive video is highly suitable for use as a learning medium for students in the Basics of Education Technology course.

**Keywords:** ADDIE development model; Basics of educational technology course; Development; Interactive video

## Introduction

The rapid development of the era demands human active participation in utilizing technology across various aspects of life (Sekiyama, 2020). Referred to as the Fourth Industrial Revolution, the changes occur so swiftly and massively, resembling a leap or breakthrough in the changing times in a relatively short period. Education, as a part of life, needs to keep up with the latest scientific developments to meet global needs (Parsons, 2021). The impact of the Fourth Industrial Revolution on education is transformative, with the education sector adapting to support and enhance technological progress (Saputra et al., 2023). Although integrating technology into education is important, it is necessary to remember that technology alone cannot solve all educational challenges (Akdemir et al., 2022). Modern education is not just about transferring knowledge but also shaping personalities and developing specific skills (Fahrozy et al., 2022).

21st-century learning requires technology integration to meet the demands of the millennial era. High-level thinking skills, collaborative skills, and mastery of information technology are the primary focuses (Anagün, 2018; Dilullo et al., 2011; Rahayu et al., 2022; Sugiyarti et al., 2018). Amid the pandemic, video-assisted learning has become popular for effectively conveying complex information and increasing student engagement (Marhami et al., 2020; Tayade et al., 2018).

The Indonesian government, through the Ministry of Education and Culture, encourages educational improvement by establishing interactive learning process standards. However, its implementation has not fully materialized in the field. Universitas Negeri Padang (UNP) as an educational institution must innovate to meet these standards and provide easy access for students. The Educational Technology Study Program at UNP aims to produce graduates who excel in curriculum analysis, educational program development, and learning multimedia.

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Based on the results of interviews with the lecturer, the Basics of Educational Technology course at UNP has theoretical content requiring various learning resources. Despite being equipped with instructional videos, their lengthy duration has caused some students to lose interest, influencing exam results. The proposed use of interactive videos can provide variation and enhance student engagement, especially in online or blended learning.

H5P (HTML 5 Package) emerges as a solution, allowing the creation of interactive content without the need for additional applications. Utilizing gamification and interactive activities, such as those provided by H5P, to increase student engagement in the classroom is essential (Govindarajan, 2021). H5P's advantages include easy creation, sharing, reuse, compatibility with mobile devices, and a free license (Scapin, 2018). The use of H5P in interactive videos can provide feedback from students, increase learning interest, and make learning more diverse (Mutawa et al., 2023). The process of creating interactive videos follows the ADDIE model, consisting of Analysis, Design, Development, Implementation, and Evaluation. This systematic model is designed to create learning resources that meet the needs of students (Priyadi, 2019).

Based on the existing phenomenon, researchers conducted a study with the aim of evaluating the validity of the interactive videos developed for the course Fundamentals of Educational Technology. In this study, researchers developed interactive video media that updates our perspective on educational videos. This media utilizes the latest technology in interactivity and visualization to create a deep and enjoyable learning experience for students. By providing responsive content tailored to individual needs, this media allows users to actively engage in their learning process, thereby helping students better understand difficult concepts. It is hoped that the presence of this interactive video media will change the paradigm in education, increase learning interest, and expand access to quality education.

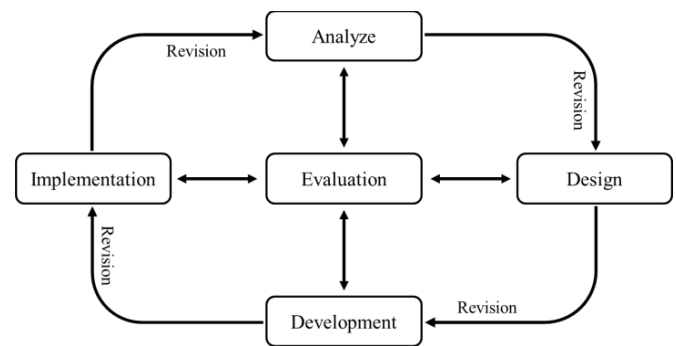
**Method**

This research is a research and development (R&D) study, utilizing the ADDIE model as the chosen development model. R&D (Research and Development) can be defined as a research method focused on creating or developing inventions in the form of products or services. The aim of this method is to provide solutions, solve problems, or generate useful new knowledge (Yolanda et al., 2020), this method is a systematic approach for researching, designing, producing, and validating the products that have been developed

(Kristanto, 2018). The ADDIE model remains highly relevant for several reasons. Firstly, it demonstrates excellent adaptability in various conditions. Secondly, it exhibits a high level of flexibility in addressing problems and proves to be effective. Thirdly, the ADDIE model offers a structured general framework with the provision for revisions at each stage (Angko et al., 2017).

The stages of this development model begin with the analyze and design phases, followed by the development and implementation stages. The final stage is the evaluation phase. The overall objective of this research is to assess the feasibility of the developed product. In this context, feasibility means that the developed product meets the established criteria. Feasibility also refers to the validity indicators with the aim of producing a product that is suitable for use based on the analysis of the research subject's needs conducted beforehand.

Feasibility testing is carried out through validity testing. Before conducting validity tests, the interactive video is developed through a needs analysis followed by a design phase that includes creating script and storyboards for the video. To collect validity test data, the developed video media is validated by experts, including media experts, content experts, and language experts. The purpose of the validation is to analyze the validity of the developed product. The following is the flow of the research and explanations for each stage of development in more detail.



**Figure 1.** ADDIE model development procedure chart

The Analysis stage is conducted through a needs analysis process. The goal is to analyze the students' needs for the product to be developed. Based on the initial study, the analysis includes several aspects, such as curriculum and material analysis, user needs analysis, and specification analysis. The Design stage begins by creating a script and storyboard as the framework for the interactive video based on the needs analysis. The aim is to make the developed media more structured and systematic. It is then followed by the pre-production process, which includes casting, necessary equipment, shooting locations, and so on.

The Development stage involves producing the video based on the earlier design thinking. Afterward, the produced video is submitted to validators who will assess it as a form of feasibility testing. Validators will consist of media experts, content experts, and language experts who will evaluate the video in their respective fields. The Implementation stage is carried out by applying the product on a small scale. If the validator approves the media for implementation, the product is tested on a limited scale. This stage aims to determine the practicality of the media by observing user responses, in this case, the students.

The Evaluation stage involves reviewing the tested product. The goal is to identify shortcomings in the produced product for further improvement. The hope is that the resulting product can be used on a larger scale. For this research, the researcher analyzes the validity of the obtained data in the development stage. Consequently, data will be collected by providing questionnaires to three expert validators. The results of their validation will then be analyzed descriptively and quantitatively with the aim of determining the feasibility of the developed interactive video. The feasibility test is analyzed through the following Equation 1 (Riduwan, 2013).

$$P = \frac{R}{SM} \times 100\% \tag{1}$$

Information:

P = Validity Score

R = Obtained Score

SM = Maximum Score

After obtaining the validity scores, the results are then categorized based on their levels of validity, as outlined in the following table.

**Table 1.** Validity Category (Riduwan, 2013)

Validity Score (%)	Category
81-100	Very valid
61-80	Valid
41-60	Fairly Valid
21-40	Invalid
0-20	Very Invalid

## Result and Discussion

### *The Process of Developing Interactive Video Media*

Video plays a crucial role in higher education. It is used in traditional courses, serves as a key element in many blended courses, and is often employed as the primary method of information delivery in online courses (Brame, 2016). Video media is an audiovisual type capable of capturing, recording, processing, and displaying moving images, simultaneously stimulating

both hearing and sight. Using video in education creates an engaging environment and can enhance students' overall understanding. Videos have advantages such as creating strong impressions, influencing student attitudes, being repeatable as needed, and being flexible for use in various places and times. Additionally, videos are user-friendly, can stand alone without requiring additional teaching materials, and present visualizations in various formats such as text, images, sound, animations, and other videos (Eldarni et al., 2014; Rusman et al., 2011; Susilana et al., 2009).

Interactive video media is an educational medium that combines sound, movement, images, text, and graphics with interactive elements to engage users with learning material (Prastowo, 2014). Interactive videos provide clear practical guidance through audio-visual presentations, allowing students to learn independently at any time and enhancing material comprehension (Niswa, 2012). This medium is considered interactive because it involves students as users who interact with the media, not just as viewers or listeners (Pradipta, 2017).

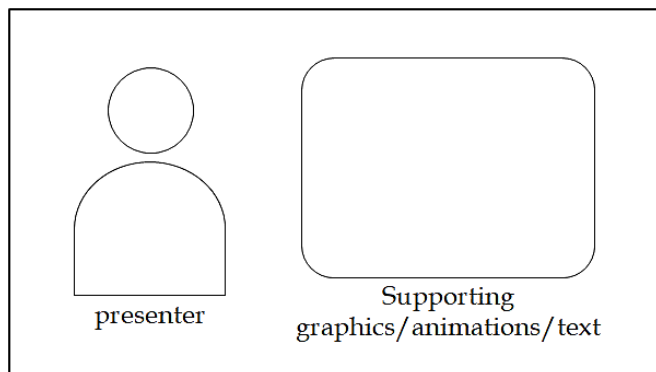
This research chooses the ADDIE model as a development model. The ADDIE model is often chosen for developing teaching materials because it is practical, simple, and structured. This model is systematic and flexible, effective in addressing learning issues, and allows for revisions at each stage. This study adopts the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation.

### *The Analysis Stage*

The research phase begins with a needs analysis through observation techniques and interviews with students and lecturers. The purpose of this stage is to identify the possible causes of a problem in the learning process (Hidayat et al., 2021). Interviews are conducted to determine the previously used learning media in lectures, their utilization, and the challenges faced. So far, lecturers have supplemented the *Dasar-Dasar Teknologi Pembelajaran* course with various learning resources, including instructional videos. However, these videos have a relatively long duration, causing students to sometimes feel bored and not follow them to the end. The teaching approach used has not entirely captured the attention of students to actively participate in the learning process. Therefore, there is a need for innovative learning media that can capture students' interest and keep them focused. The needs analysis conducted by the researcher includes curriculum and material analysis, user needs analysis, and specification analysis.

*The Design Stage*

In this design phase, a structural design is created in the form of a script and storyboard for the interactive video, tailored to the needs. Later, the video design will be enhanced with edited and adjusted graphics to make it more engaging. Illustrations, videos, font types, and audio in the video are adjusted to fit the chosen theme. The design of the interactive video based on the needs analysis can be seen in Figure 2.



**Figure 2.** The design of the interactive video

*The Development Stage*

In the development phase, the interactive video is produced according to the previously made design until the interactive video is completed. The resulting product is then validated by expert validators. Validation is conducted based on the aspects of media, content, and language. After the validation process, the researcher also undertakes a series of revision processes on the developed product based on improvements and suggestions from the expert validators. The interactive video is validated by three validators, namely media expert, content expert, and language expert. Additionally, the validators involved are lecturers from Universitas Negeri Padang (UNP) and Universitas Islam Negeri Imam Bonjol Padang (UIN-IB). The validation aims to assess the feasibility of the interactive video in terms of content and its presentation using technology in learning. Content validation is performed by examining the suitability of using interactive video in the learning process in terms of the format that outlines the substance and its systematic nature. Furthermore, content validity also evaluates the appropriateness of the content of the interactive video, indicating the alignment of the teaching material contained in the video with various learning objectives. The validity also tests the suitability of the interactive video in terms of usability, stating both instructional and additional impacts that can be obtained after the interactive video is used in learning. The table below shows the results of the validation of the interactive video based on expert opinions.

**Table 2.** Results of Media Expert Assessment

Aspect	Maximum Score	Obtained Score
Appearance	35	32
Sound/Audio	15	12
Media Usage/ Access	20	20
Functionality & Navigation	10	10
Interactivity	25	24
Validity Score		93%

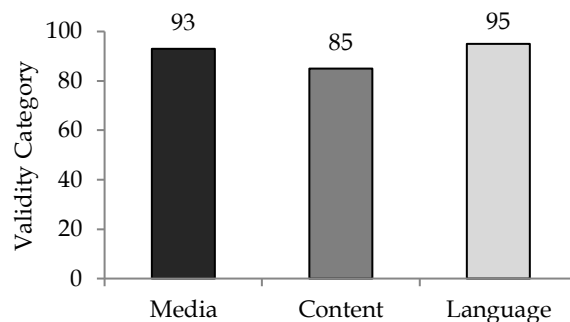
**Table 3.** Results of Content Expert Assessment

Aspect	Maximum Score	Obtained Score
Learning Objectives	25	23
Quality of Content/Material	30	24
Learning Material	25	20
Interactivity	20	18
Validity Score		85%

**Table 4.** Results of Language Expert Assessment

Aspect	Maximum Score	Obtained Score
Adherence to Language Rules	10	9
Sentence Coherence	20	19
Relevance to Learners	30	29
Validity Score		95%

From the assessment results, in Table 2, media expert gave a score of 93% for the developed interactive video, in Table 3, content expert provided a score of 85% for the content included in the interactive video, and in Table 4, language expert gave a score of 95% for the linguistic appropriateness used in the interactive video according to the applicable provisions. Based on these three tables, the validity category of the developed interactive video falls into the very valid category. These results are supported by previous studies by (Wardani et al. (2018), Wirasasmita et al. (2018), Hasanah (2021), Williyana et al. (2018), and Rahmawati et al. (2021), who developed interactive video media and obtained excellent validation results.



**Figure 3.** Interactive video validity results chart

The appearance of the interactive video without interaction and the view containing interactions such as questions can be seen in Figures 4 and 5 below.



Figure 4. Interactive video display without interaction



Figure 5. Interactive video display with interaction

*The Implementation Stage*

This stage is the trial phase of the interactive video that has passed the validation test from the experts. The trial is conducted by testing the product on 5 students to determine the level of practicality of the product. Students are asked to use the interactive video and then fill out a questionnaire related to the ease/practicality of using the interactive video. The questionnaire consists of 19 statements divided into several aspects, namely: usage condition, time effectiveness, and usefulness.

The summarized results of the small-scale trial can be seen in the table 5.

**Table 5.** Results of the Small-Scale Trial

Aspect	Maximum Score	Obtained Score
Usage Condition	175	161
Time Effectiveness	150	132
Usefulness	150	127
Validity Score		88%

Based on the table above, it can be observed that from the small-scale trial, a score of 88% was obtained, which already falls into the category of very high.

*The Evaluation Stage*

After the implementation phase is completed, the next step is evaluation. Previously, the interactive video media underwent a validation process by three validators. Each validator provided assessments: 93%

for the interactive video media, 85% for the content within the video, and 95% for the linguistic appropriateness in accordance with applicable guidelines. Based on these three assessments, it can be concluded that the developed interactive video media falls into the category of very valid.

This was followed by a small-scale trial, where the interactive video media was tested on five students, and the trial results reached a score of 88%. Therefore, it can be concluded that the developed interactive video media is very practical to use. However, this trial was conducted on a small scale, and it is hoped that in the future, the interactive video media can undergo testing on a larger scale.

**Conclusion**

Based on the validity test results, it was found that the developed interactive video is considered highly suitable or very valid based on the assessments of the validators, making it a viable alternative learning resource for students. Subsequently, a small-scale trial was conducted with users, and the results of this activity indicated that the developed interactive video media is very practical to use. Therefore, the findings of this research can be used as a reference for ideas in analyzing interactive videos as one of the development products in educational technology.

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**Author Contributions**

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**Conflicts of Interest**

The authors declare no conflict of interest.

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