DEVELOPMENT OF EDUCATIONAL ANIMATION BASED LEARNING MEDIA TO OPTIMIZE DISTANCE LEARNING

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Abstract

The evolution of distance learning demands innovative instructional media capable of delivering material effectively, particularly for conceptual subjects such as *Human-Computer Interaction* (HCI). This study aims to develop an educational animation-based learning medium that presents course content in a visual, engaging, and easily comprehensible format for students within an online learning context. The urgency of this research stems from the low effectiveness of conveying HCI material through conventional media such as plain text or static slide presentations which are often too abstract and difficult to grasp without visual support. The research employs the ADDIE development model, consisting of Analysis, Design, Development, Implementation, and Evaluation. The final product is a n educational animation video that systematically and clearly presents content from Module 1 of the HCI course. Validation was conducted by subject matter experts and media specialists, followed by a limited trial involving students. The results indicate that the developed media is highly feasible in terms of content, design, and delivery. The animation successfully assists students in better understanding foundational HCI concepts. This research contributes to overcoming challenges in online content delivery and enhances the readability and visual appeal of learning materials.

Keywords: Educational Animation, Learning Media, Distance Learning, Human-Computer Interaction, ADDIE

1 INTRODUCTION

The evolution of distance learning has brought significant changes to higher education, demanding effective and engaging instructional media, especially for conceptual and abstract subjects such as Human-Computer Interaction (HCI). In current practice, learning materials for HCI are often delivered through conventional media like text documents or static slide presentations, which lack visual support and make it difficult for students to grasp complex concepts. This phenomenon highlights a persistent problem in the effectiveness of online learning delivery, creating an urgent need for innovative solutions that align with the nature of the subject and the characteristics of distance learners.

Previous studies have consistently demonstrated the potential of visual-based learning—particularly animated media in enhancing student engagement, motivation, and conceptual understanding. For instance, in science education, video-based instructional media has been shown to significantly improve both students' learning outcomes and engagement (Akhmad, 2016). Similarly, the use of animated media has been found to be more effective than conventional teaching methods (Saleh & Andhini, 2021), while Canva-based animated videos have shown a positive impact on students' motivation and academic performance (Hapsari & Zulherman, 2021). Instructional videos have also proven effective in English language learning, helping students grasp content more easily through engaging visualizations (Syafitri et al., 2025). Nurhayati (2023) further supports this, stating that animated videos not only enhance students' motivation but are also considered suitable by both educators and learners for improving comprehension through dynamic presentations. In addition, Fiyola et al. (2025) emphasize that animated video media can improve learning motivation by presenting material in a more appealing and accessible way.

Despite these promising findings, there remains a notable gap in the systematic development of animation-based instructional media specifically designed for Human-Computer Interaction (HCI) courses. Current methods often rely on static or text-heavy resources, which may limit students' comprehension and reduce motivation in online learning environments. This highlights the urgent need to design and implement alternative instructional media that are not only visually communicative and pedagogically robust, but also tailored to the conceptual nature of HCI and the needs of distance learners.

This study proposes the development of an educational animation-based learning media, aiming to optimize content delivery and improve learning outcomes in the context of distance education. The research adopts the ADDIE model Analysis, Design, Development, Implementation, and Evaluation as a structured framework to ensure systematic development and implementation. The expected contribution includes both theoretical value, by expanding the application of multimedia learning theory in distance education, and practical benefits, by producing feasible and engaging learning media for use in actual teaching scenarios.

By addressing an urgent educational need, filling the existing gap, and aligning with the broader goals of enhancing instructional quality in open and distance learning, this study

plays a strategic role in advancing educational technology for sustainable learning practices. Moreover, this research contributes to solving the issue of ineffective content delivery in abstract subjects, provides a replicable model for similar media development in other courses, and supports institutions, educators, and instructional designers in crafting media that is informative, accessible, and visually engaging especially within fully online learning environments.

2 METHODOLOGY

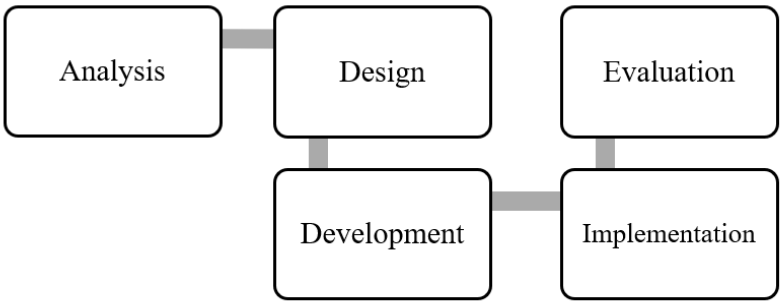

Figure 1. ADDIE model

The development of animation-based learning media for the Human-Computer Interaction (HCI) course in a distance learning environment was systematically guided by the ADDIE model, a structured and widely adopted instructional design framework. This model comprises five interrelated phases Analysis, Design, Development, Implementation, and Evaluation which can be implemented procedurally, cyclically, and integratively to suit the specific needs of the course. Hidayat and Nizar (2021) emphasize the flexibility of the ADDIE model in various educational contexts. Similarly, Sugihartini and Yudiana (2018) describe the application of the ADDIE framework through all five stages in the development of instructional media.

During the Analysis phase, the research team identified instructional needs by examining the challenges in conveying HCI content, particularly its abstract nature and the lack of student engagement with conventional materials. This involved reviewing course documents, conducting interviews with subject matter experts, and distributing questionnaires to gather student learning preferences. In the Design stage, a storyboard and script were developed for Module 1, outlining instructional objectives, narration, visuals, and interaction elements to ensure pedagogical coherence. The Development phase translated the design into an animated

video using specialized software and voice-over tools, with iterative input from multimedia designers and HCI experts to maintain content accuracy. During Implementation, a limited trial was conducted with students from Universitas Terbuka enrolled in the HCI course, where the animation was delivered via the LMS, followed by a brief learning session and post-test to gauge comprehension. Finally, in the Evaluation phase, expert validation and student feedback were collected to assess content quality, usability, and learning effectiveness. The findings from this evaluation informed the refinement and finalization of the animation-based learning media.

3 DISCUSSION

In the Analysis stage, the researchers began by identifying the main problems in the learning process of the *Human-Computer Interaction* (HCI) course within a distance learning environment. The abstract and theoretical nature of HCI content often presents challenges for students to fully grasp the concepts, especially when delivered through conventional media such as plain text or static slide presentations. The lack of visualization and interactivity in such media reduces student engagement and information retention. To address this, a needs analysis was conducted through a review of relevant literature to explore the role and effectiveness of animation-based media in supporting distance learning, particularly for conceptual subjects. Additionally, questionnaires were distributed to students to gather insights into their preferences for learning media that are engaging, easy to understand, and supportive of independent study.

3.1 Design and development

In the Design stage, the analysis results served as the foundation for structuring and developing the content of the learning media. This stage involved defining learning objectives, creating a storyboard, and writing the script for the animation based on Module 1 of the HCI course. Visual elements such as concept illustrations, animation transitions, color schemes, and narration style were carefully planned to align with instructional design principles and the specific needs of distance learning. User interaction was also considered in the design to ensure that students remain actively engaged with the content.

Table 1. Learning Animation Video Scenario

Scene	Scene Description (English)	Text/Voiceover (English)
1	Blue sky, green grass, clouds.	"Welcome to Module 1 of Human-Computer Interaction. Let's explore it in a fun and interactive way!"
2	Lecturer appears on screen, smiling.	"I'm Bu Mayang, your lecturer. Today, we'll learn the basics and importance of HCI in daily life."
3	Lecturer explains with colorful icons (PC, smartphone, etc.).	"Human-Computer Interaction studies how people interact with technology, especially computers."
4	Microsoft Office interface transitions (Word, Excel, PowerPoint).	"Consistent interface helps users adapt across Word, Excel, and PowerPoint efficiently."
5	OS X Leopard interface (menu, Dock, Finder).	"OS X Leopard offers intuitive interactions: top menu, Dock icons, and structured Finder."
6	Computer screen highlights hardware and integrated systems.	"Machine aspect: HCI design applies to devices like PCs, planes, and smart appliances."
7	Human figure on screen.	"Human aspect: HCI explores not just tools, but how humans interact with machines."
8	Human and computer shown together.	"HCI supports human work, but user satisfaction goes beyond just computer use."
9	Lecturer gives summary and related disciplines.	"Let's review the fields related to HCI and how they contribute."
10	Icons for related fields: CS, Psychology, Anthropology, Sociology, Graphic Design.	"CS, Psychology, Anthropology, Sociology, and Graphic Design all relate to HCI."
11	"Goodbye" animation.	"Thanks for watching. See you in the next module!"

The color palette in the animation video was chosen to create a calm, engaging, and visually consistent learning environment. Soft tones like blue and green dominate the background, while brighter accents such as yellow and orange highlight key elements and guide learner attention.

Figure 2. Palet color in animation vidio

The following image illustrates the animation scenario developed for the Human-Computer Interaction (HCI) course. Each scene was carefully designed to represent specific concepts visually, supporting the narration and aligning with the learning objectives of Module 1. By combining visual elements such as icons, interface examples, and animated characters with

voiceover explanations, the animation aims to enhance student engagement, facilitate conceptual understanding, and address the challenges commonly faced in distance learning environments.

Table 2. Visualizing the concept

Scene	Scene Description (English)	Picture
1	Blue sky, green grass, clouds.	
2	Lecturer appears on screen, smiling.	
3	Microsoft Office interface transitions (Word, Excel, PowerPoint).	

The development of the learning video focused on transforming abstract course material into engaging visual content. Through careful scripting, animation, and voiceover integration, the video was designed to enhance student understanding and retention.

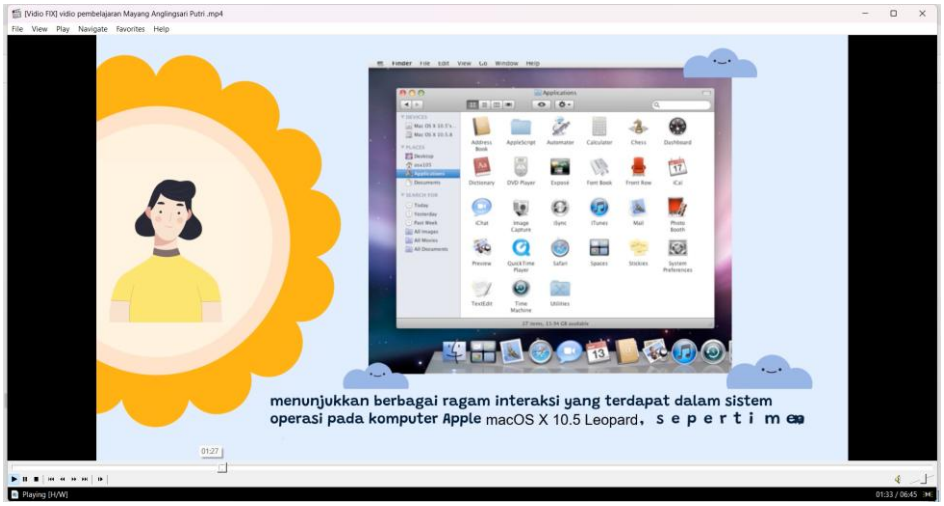

Figure 2. Vidio Animation based learning (1)

As a result, the final product is an instructional video that is interactive, visually appealing, and suitable for distance learning environments.

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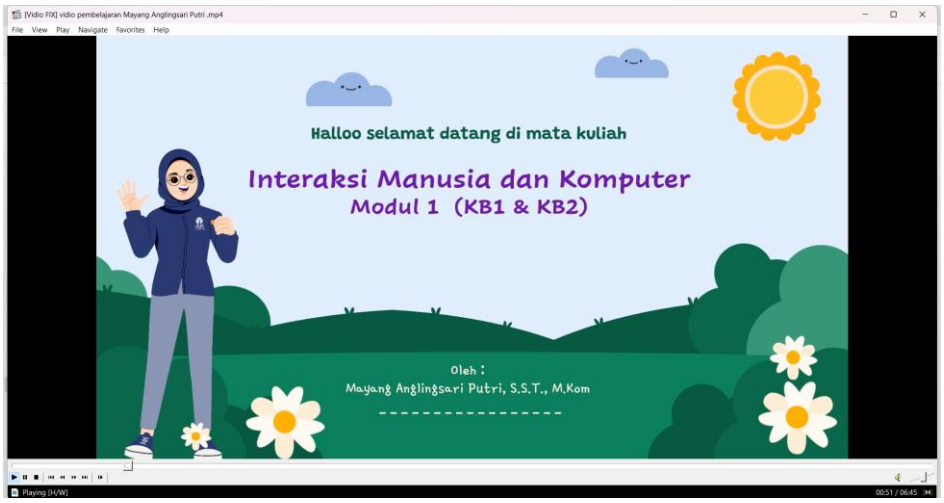

Figure 3. Vidio Animation based learning (2)

After the learning video was completed, the authors uploaded it to an online platform, specifically YouTube, to make it easily accessible for students and a broader audience interested in HCI. This platform was chosen for its wide reach and user-friendly interface, allowing learners to access the content anytime and from any device. An evaluation was then carried out to assess the effectiveness of the video and gather feedback from viewers regarding its clarity, engagement, and usefulness.

3.2 Evaluation

In this study, an evaluation was conducted on the animated video-based learning media developed for the course HCI in the Information Systems Study Program at Universitas Terbuka. The evaluation was carried out by two faculty members who assessed two main aspects: the video media and the instructional scenario. The media evaluation results indicated that the material was considered highly appropriate and aligned with the learning objectives, with clear narration and visually engaging presentation. However, feedback was provided to improve the audio quality, particularly by increasing the volume of the narration to make it more prominent.

Table 3 presents the evaluation of the animated video learning media by a media reviewer. The video was assessed as highly suitable for achieving learning objectives, with very clear narration and strong visual design. The audio quality was rated as good, and the duration was considered appropriate for effective learning. One suggestion was to reduce the background music volume and enhance the presenter’s voice clarity.

Table 3. Evaluation of Learning Media (Animated Video)

No.	Evaluated Aspect	Assessment
1	Relevance of Content to Learning Objectives	Excellent
2	Clarity of Presentation and Narration	Very Clear
3	Visual Quality and Design	Excellent
4	Audio Quality	Good
5	Duration and Effectiveness	Highly Appropriate
6	Additional Suggestions and Feedback	Lower the background music volume and increase narration clarity.

Table 4 provides the evaluation of the instructional video scenario by a content reviewer. The scenario was found to be highly aligned with the learning objectives, realistic, and engaging. The flow and instructions were clearly presented, and the scenario was considered effective in promoting understanding and critical thinking. A key suggestion was to add more explanation on machine aspects in the context of Human-Computer Interaction (HCI). Indonesiakan

Table 4. Evaluation of Instructional Video Scenario

No.	Evaluated Aspect	Assessment
1	Alignment of Scenario with Learning Objectives	Highly Appropriate
2	Relevance and Realism of the Scenario	Very Realistic
3	Engagement and Interactivity	Excellent
4	Clarity of Instructions and Scenario Flow	Very Clear
5	Effectiveness in Promoting Understanding and Critical Thinking	Very Effective
6	Additional Suggestions and Feedback	Add explanation on the machine aspect in HCI interaction.

Based on the results of Tables 3 and 4, it was found that the instructional video media and scenario content were well-structured, realistic, and capable of enhancing students' understanding and critical thinking. However, some suggestions for improvement were also provided, such as enhancing the audio quality in the video and adding more detailed explanations regarding the machine interaction aspect in the scenario. These findings will serve as a foundation for refining the media prior to wider implementation.

4 CONCLUSION

This study demonstrates that the development of animation-based instructional media can significantly enhance the delivery of conceptual subjects such as Human-Computer Interaction in a distance learning context. Utilizing the ADDIE model, the research systematically developed an educational animation video tailored to the content of Module 1 in the HCI course. The validation and evaluation processes, involving expert reviewers and student trials, revealed that the media is feasible, engaging, and effective in supporting student understanding. Although minor improvements were suggested such as refining audio quality and elaborating on machine interaction aspects overall, the media was well-received. These findings underscore the value of animated media in improving the accessibility, clarity, and engagement of learning materials in online education. The developed media can serve as a prototype for further innovation and implementation across similar courses and disciplines.

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