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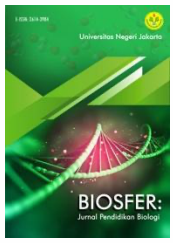

Feasibility of a documentary film on human reproductive system

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ABSTRACT

The continuous advancement of technology in the era of globalization has an inevitable impact on the educational sector, particularly in the learning process. The use of media is one of the critical components in this process. This research develops an educational medium in the form of a documentary film about the human reproductive system, based on an inventory of medicinal plants for male reproductive health in Padang Tikar Village. This documentary film is designed to support the explanation of abstract concepts related to the human reproductive system, thereby facilitating the understanding of material that cannot be directly observed. The objective of this study is to develop and assess the feasibility of an instructional medium in the form of a documentary film on the human reproductive system, based on the inventory of medicinal plants for male reproductive health in Padang Tikar Village, West Kalimantan, Indonesia. The research design employs a Research and Development (R&D) approach, limited to five stages: identifying potential and problems, data collection, product design, design validation, and design revision. The research instruments used include an interview sheet with Grade XI Biology teachers and a feasibility test sheet for validating the documentary film by five validators, consisting of three Biology teachers and two Biology Education lecturers, to assess the documentary's feasibility in terms of format, content, language, and usability. The validation analysis employs a formula based on Aiken's V (Aiken, 1985). Results show that the documentary film achieved high validity in all aspects, with average scores of 0.84 for format, 0.85 for content, 0.93 for language, and 0.91 for usability. The overall average score was 0.87. These findings indicate that the developed documentary film is highly feasible and can be used as an effective educational medium for teaching the human reproductive system.

INTRODUCTION

The continuous advancement of technology in the era of globalization exerts an inevitable influence on the educational sector, particularly in the learning process (Tupen et al., 2023; Agustian & Salsabila, 2021). In the learning process, both teachers and students are required to master the use of technology, thus necessitating the use of appropriate media to achieve mastery of content and learning objectives. The higher the level of content mastery and learning outcomes achieved by students, the higher the level of success in the learning process (Darisman et al., 2021). The success of the learning process, which supports the achievement of student learning outcomes, is influenced by various factors, one of which is the use of educational media (Junaidi, 2019; Narestuti et al., 2021; Aliyyah et al., 2021).

Educational media is a crucial component in the teaching and learning process. The use of educational media serves as an intermediary for teachers to convey information to students, allowing them to understand what they are learning (Wulandari et al., 2023; Nurmala & Mane, 2021). Through the use of educational media, teachers can more easily explain the learning material and facilitate the communication of the content to students during the teaching and learning process (Harahap et al., 2024; Wulandari et al., 2023; Moto, 2019). Furthermore, educational media can help teachers accelerate the learning process, make learning objectives and teaching materials easier for students to understand, and have a significant positive impact on students' critical thinking skills ; Nurmala & Mane, 2021; Lathifah, 2020). The types of educational media used by teachers can include audio, visual, and audiovisual media (Silahuddin, 2022; Ibrahim et al., 2022; Lestari et al., 2018).

Audiovisual media is a type of media used in the learning process that engages both hearing (audio) and sight (visual) senses simultaneously (Setia et al., 2023; Nomleni et al., 2023; Tanjung, 2021). One form of audiovisual media is documentary films (Sofiyah et al., 2023; Shelli et al., 2023). A documentary film is an audiovisual medium that depicts real events or facts occurring in society, making it easier for viewers to understand and trust the facts presented (Suryanto, 2024; Rikarno et al., 2019; Perkasa & Sayatman, 2016). Documentary films, as educational media, can also enhance students' learning achievements in both cognitive and affective domains (Jefrilianto et al., 2019; Oktavia & Panjaitan, 2016).

One of the topics in biology is the human reproductive system. The human reproductive system is a fundamental concept related to life, which cannot be directly observed due to its abstract nature and is difficult to comprehend, thus requiring an illustration that should be embedded within the media and its delivery (Hadie et al., 2024; Deadara et al., 2017 ; Laksmi et al., 2022). So far, several educational media have been used to convey the material on the human reproductive system, including animation media (Afni, 2019), videoscribe media (Daeli et al., 2024), and interactive media based on Quizizz (Ningsih et al., 2023). However, among these media, documentary films have not yet been used as an educational medium for teaching the human reproductive system.

In addition to containing teaching materials, learning media can also be developed by integrating research findings, such as medicinal plant inventories. Previous research has developed various media based on medicinal plant inventory. For example, Paramita et al. (2018) developed a booklet as a learning media on the benefits of biodiversity. Putri et al. (2019) developed a documentary film based on the results of the inventory of medicinal plants for digestive system diseases. Saragih et al. (2024) developed a documentary on the process of making traditional medicines by the Batak Simalungun tribe, and Afifah & Marlina (2016) developed a documentary on medicinal plants in Bange Village. International research has also highlighted the urgency of integrating ethnomedicinal knowledge into the educational domain. Di Serio et al. (2013) revealed that the use of traditional medicine can enhance students' understanding of health-related issues in African schools. Meanwhile, Kamble et al. (2020) demonstrated that integrating information on local medicinal plants into multimedia-based learning materials can improve student engagement and comprehension in India.

However, to date, no instructional media in the form of a documentary film has been found that combines content on the human reproductive system with the results of medicinal plant inventories for male reproductive health. This study presents a novelty in the form of developing a documentary film that integrates human reproductive system content with local research findings on medicinal plants for male reproductive health. No previous research has integrated these two aspects into a single learning medium. Based on this rationale, the study is considered important due to students' difficulties in understanding reproductive system material and the limited use of local knowledge as a learning resource. Additionally, the preservation of traditional knowledge on medicinal plants poses a challenge

in the modern era, making educational media that integrates scientific and local cultural aspects highly necessary.

METHODS

Research Design

This research is Research and Development, which aims to produce learning media in the form of documentary films on the human reproductive system material. The development model used refers to the stages proposed by Borg & Gall (1984), which includes ten steps, namely: (1) identification of potential and problems, (2) data collection, (3) product design, (4) design validation, (5) design revision, (6) product trial, (7) product revision, (8) usage trial, (9) final product revision, and (10) mass production.

Instrument

The research instruments used included an interview sheet with Grade XI Biology teachers and a feasibility test sheet for the validation of the documentary film medium. The interview sheet aimed to gather information regarding teachers' perceptions of the need for instructional media, challenges encountered in teaching the human reproductive system, and the potential for utilizing a documentary film based on the inventory of medicinal plants in the learning process. The feasibility test sheet was used to assess the extent to which the developed documentary film met the eligibility criteria across various aspects. The selection of validators was conducted using purposive sampling. Validation by the selected validators in this study is essential to ensure that the developed documentary film medium adheres to scientific and educational standards. The purpose of validation is to obtain feedback and suggestions for improvement on the product being developed so that it meets the feasibility and validity requirements for use (Rizanti & Jufri, 2023). The validators involved were Biology Education lecturers and Biology subject teachers. Biology Education lecturers possess knowledge of learning theories and biology education curricula, while experienced high school Biology teachers provide practical insights into the difficulties students face in understanding abstract biological concepts, as well as a solid understanding of how to effectively use instructional media in classroom practice.

Procedure

The procedure in this study consists of five stages. (1) Potential and Problems: In this stage, interviews are conducted with Biology teachers from grade XI to gather information on various aspects of the learning process, the use of educational media, challenges faced by students during learning activities at school, and research findings related to the inventory of medicinal plants. (2) Data Collection: This involves conducting a pre-research phase, which includes interviews and observations at schools and interviews with informants about the utilization of medicinal plants for male reproductive health in Padang Tikar Village. The data obtained from the research will be presented in the documentary film, which will be accompanied by an analysis of the stages involved in the learning process on the human reproductive system material. (3) Product Design: The development of the documentary film is designed using the CapCut application, which includes: a) creating a synopsis, b) creating a storyboard, c) writing a script that consists of an introduction, content, and conclusion. The introduction presents the material on the human reproductive system, followed by the introduction of plants still utilized by the community in Padang Tikar Village. The content section contains the types and descriptions of plants used as medicine for male reproductive health, followed by the methods of processing these medicinal plants. The conclusion section contains expressions of gratitude, d) Creating a production script or scenario. At this stage, voice-over (dubbing), cutting (cut-away), and insertion (cut-in) are performed, e) Documentary film packaging, resulting in a final documentary film in file format. (4) Design Validation: At this stage, the documentary film is evaluated for its feasibility as an educational medium by five validators. The validation instrument uses a Likert scale validation sheet. (5) Design Revision: In this stage, revisions are made based on the suggestions provided by the validators.

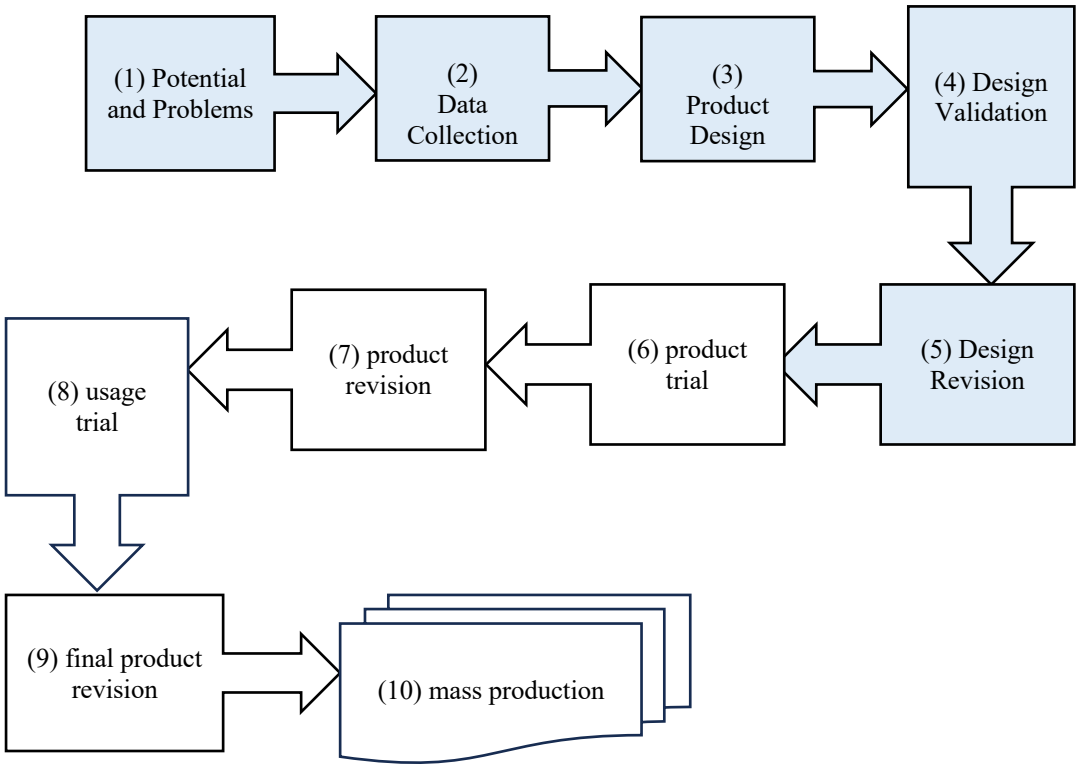


Figure 1. Research Procedure

Data Analysis Techniques

The data analysis used to test validity is Aiken's V Statistic with the content-validity coefficient method, which is an analysis based on the assessment results from *n* experts regarding an item in terms of how well the item represents the construct being measured, where the data is quantitative. The range of possible V values is between 0 and 1. The higher the V (approaching 1 or equal to 1), the higher the validity score; and the lower the V (approaching 0 or equal to 0), the lower the validity score of an item (Arifin, 2017). The final result of the Aiken V coefficient calculation will determine the feasibility and validity of the documentary film media.

RESULTS AND DISCUSSION

The documentary film media as a learning medium for the human reproductive system material for grade XI SMA, as seen from the validation conducted by 5 validators. The analysis of the validation results is based on the content validity of Aiken's V. The results of the analysis are presented in Table 2.

Table 2.
The results of the Documentary Film Media Validation

Aspect		Indicator	Value	Description
Format	1.	Clarity of the resulting documentary film	0.87	Very Valid
	2.	Suitability of colors, image display, and text.	0.80	Valid
	3.	Suitability of the size and position of the subtitles displayed according to the screen size and ease of reading by the audience.	0.93	Very Valid
	4.	Suitability between instrumental music and narrator's voice.	0.87	Very Valid
	5.	Voice variation.	0.73	Valid

Aspect		Indicator	Value	Description
Content	6.	The alignment of the film's content with Learning Outcomes (CP) and Learning Objectives (LO).	0.87	Very Valid
	7.	The alignment of the documentary film's content with the material concepts.	0.73	Valid
	8.	The documentary film contains images, sounds, and text.	0.93	Very Valid
	9.	The documentary film provides information about the names of plants and their uses as medicine for male reproductive health.	0.93	Very Valid
	10.	Completeness of the research information presented in the documentary film media.	0.80	Valid
Language	11.	Using language that is easy to understand.	1.00	Very Valid
	12.	The suitability of language with the Indonesian Spelling System.	0.87	Very Valid
Usage	13.	The use of media is suitable for individual, group, or class learning.	1.00	Very Valid
	14.	The media can be played on various devices such as mobile phones or computers.	1.00	Very Valid
	15.	The duration of the film is still tolerable and does not cause boredom for the audience.	0.73	Valid

Format Aspect

The format aspect consists of five indicators. The first indicator is the clarity of the resulting documentary film, where the flow of the film is coherent, presenting the purpose of the documentary, and includes images and text incorporated into the learning material. This indicator received a score of 0.87, which falls into the very valid category. The second indicator shows the validation result with an average score of 0.80, which is in the valid but needs improvement category. Based on suggestions from the validators, the suitability of the colors and images in the documentary film needs to be varied further and made more attractive to capture the students' attention. Additionally, the text should be in a larger size to make it easier to read and see (Figure 1). This aligns with Raisa et al. (2017), who stated that the use of learning media makes the learning process more engaging and motivates students to learn independently (Pradilasari et al., 2019). Images play a crucial role as visual aids in explaining abstract concepts within the human organ systems. The reproductive system is among the most challenging topics to teach in biology education. Gungor & Ozkan (2017), in their study of prospective biology teachers in Turkey, found that these difficulties arise due to the complexity of the concepts and the limitations in presenting biological processes that cannot be directly observed. Therefore, the use of visual media is highly beneficial in supporting the learning process. The Dual Coding Theory proposed by Paivio (1990) explains that when information is conveyed through two channels—verbal (narration) and visual (images or animations)—the brain is better able to process and retain it. This aligns with Mayer's Multimedia Learning Theory (2009), which states that learning outcomes are enhanced when text and visuals are presented in an integrated and coherent manner.

Figure 1. Display of color suitability, image, and text display

The third indicator is the suitability of the size and position of the subtitles. This indicator received an average score of 0.93, which falls into the very valid category. This result indicates that the subtitles displayed are appropriate for the screen size and are easy for the audience to read. As stated by Ilyas & Nurhidayah (2019), subtitles or verbal translations of audio-visual texts should be aligned and synchronized with the dialogue or verbal cues in the text, so that they can help students receive information clearly.

The fourth indicator is the suitability between instrumental music and the narrator's voice. The average score for this indicator is 0.87, which falls into the very valid category. The background music, in the form of instrumental music without lyrics, is expected to support students' concentration without being distracting, while also helping them understand the learning material. This aligns with Marwi et al. (2023), who stated that listening to music during the learning process in the classroom can improve learning outcomes and motivate students. The fifth indicator is voice variation, with an average score of 0.73, which is valid. According to suggestions from the validators, voice variation needs improvement in terms of speech style to engage students and encourage them to watch the documentary film. As stated by Pradilasari et al. (2019), if the narrator's voice is clear, it can help students understand the material being conveyed by the narrator.

Content Aspect

In the content aspect, the first indicator is the alignment of content with Learning Outcomes (*Capaian Pembelajaran* - CP) and Learning Objectives (*Tujuan Pembelajaran* - TP), with an average score of 0.87, categorized as very valid. The designed learning media must align with the Learning Outcomes (CP) and Learning Objectives (TP), so that the material and media can be well understood by the students (Figure 2). As stated by Rahayuningsih et al. (2022); Rusli (2021); and Lathifah (2020), learning media can also help teachers accelerate the learning process, making the learning objectives and teaching materials easier for students to understand

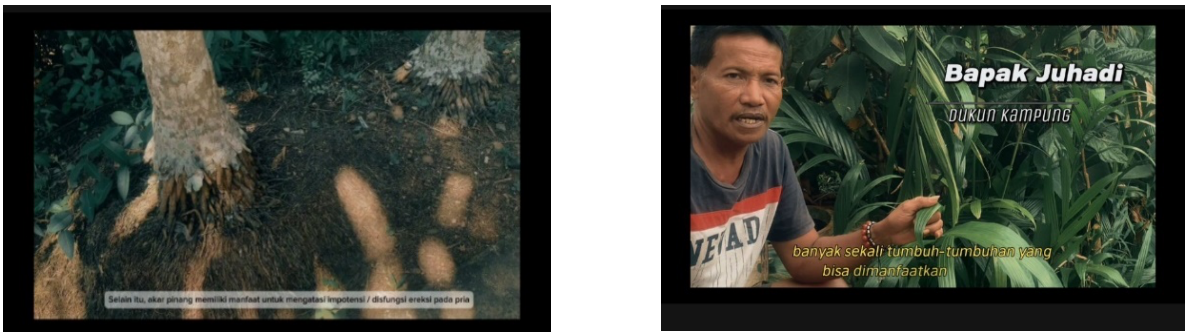
Figure 2. The display of learning objectives is adjusted to each session.

The second indicator is the alignment of the documentary film's content with the material concepts, with an average score of 0.73, categorized as valid. This means that, in this criterion, the media still has shortcomings with a V value below the Aiken V standard, which is 0.87. Based on suggestions and feedback from the validators, the material related to the human reproductive system has some content that has not been fully conveyed, and the validators recommended that the material be delivered over multiple sessions rather than in a single session. Initially, the material covered reproductive organs, hormone functions, fertilization, and disorders/diseases in the reproductive system. However, following the Merdeka Curriculum and adjusted to the content of the reproductive system material, topics such as spermatogenesis, oogenesis, menstrual cycle, gestation/pregnancy, and childbirth were added. As stated by Gustinasari et al. (2017), content in learning media should be structured comprehensively or include all aspects to help students learn in a focused manner.

Furthermore, Harefa et al. (2023); Hasni et al. (2022) mentioned that media can achieve the learning objectives that have been set. Therefore, the media should align with the material concepts that need to be conveyed.

The third indicator is that the content of the documentary film includes images, sounds, and text. The average score for this indicator is 0.93, categorized as very valid. This is because the images presented are in line with the narration from the narrator and the resource person, as well as the text regarding the human reproductive system. This aligns with Nastiti et al. (2023), who stated that a documentary film is an engaging audio-visual medium that combines sound and images, and can be played repeatedly to assist in understanding and influence the cognitive and attitudes of individuals.

The fourth indicator is that the content of the documentary film provides information about the names of plants and their uses as medicine for male reproductive health, with an average score of 0.93, categorized as very valid. This is because the film not only contains information about the material but also includes information on the use of medicinal plants by the Malay community in Padang Tikar Village, specifically for male reproductive health. The fifth indicator, the completeness of the research information presented in the documentary film, received an average score of 0.80, categorized as valid. This means that the information presented aligns with the research results, from the benefits to the processing methods. As stated by Suryanto (2024); Rikarno et al. (2019); Perkasa & Sayatman (2016), a documentary film is an audio-visual medium that depicts real events or facts occurring in society and helps the audience understand and trust the facts presented.



(a) (b)

(c)

Figure 3. The presentation of information based on the research results includes: (a) information about one medicinal plant with therapeutic properties, (b) information from informants about medicinal plants commonly used in Padang Tikar Village, along with the addition of subtitles to facilitate understanding of the information being conveyed, and (c) the processing methods of medicinal plants.

Language Aspect

In the language aspect, there are two indicators: using language that is easy to understand and using language that adheres to PUEBI (*Pedoman Ejaan Bahasa Indonesia* - Indonesian Spelling Guidelines). For the first indicator, using language that is easy to understand, the average score is 1.00, categorized as very valid. This means that the language used in the documentary film is clear, easy to understand, and flows well, making it easier to convey information. As stated by Hasan (2022), language is a communication tool that acts as an intermediary in conveying information from the sender to the receiver.

For the second indicator, using language that adheres to PUEBI, the average score is 0.87, categorized as very valid. According to Apriliana et al. (2020), using language that follows PUEBI can be more structured and meaningful, and can be understood by others, thus helping readers comprehend the information being conveyed. The validation results from the validators suggest using language in the form of creative and varied invitational sentences to make students more interested in watching the content in the documentary film.

Usage Aspect

The aspect of use consists of three evaluation indicators. For the first evaluation indicator, which is whether the media is suitable for individual, group, or class learning, it received an average score of 1.00, categorized as very valid. For the second indicator, which is whether the media can be played on various devices such as smartphones or computers, it received an average score of 1.00, categorized as very valid. The documentary film media can be used independently through a smartphone or in groups using a laptop or projector for viewing. As stated by Miftah & Rokhman (2022), in order to choose the right learning media, teachers need to consider indicators such as the number of targets (small, medium, or large groups) and the location of the target (in the classroom or open space). This means the media can be used for small, medium, and large groups and can also be used both inside and outside the classroom.

The third criterion is that the duration of the film should be tolerable to avoid causing boredom for the audience. This indicator received an average score of 0.73, which falls under the valid category. For this indicator, the validator provided feedback regarding the film's duration, noting that it was too long and completed in one session. The validator recommended that the duration be divided into separate sessions, with each session having a manageable length to prevent boredom among the audience. Initially, the documentary film was 14 minutes long. Following the validator's suggestions, the media was adjusted to a total duration of 23 minutes and 34 seconds, split into three sessions. The first session, covering male and female reproductive organs, lasts 4 minutes; the second session, covering reproductive hormones, spermatogenesis, oogenesis, fertilization, gestation/pregnancy, and birth, lasts 14 minutes; and the third session, which discusses reproductive system disorders and using documentary films as an alternative method to address male reproductive health issues through medicinal plant use, lasts 11 minutes. This aligns with Rikarno et al. (2019) view that films are generally categorized into two types: long films (over 60 minutes) and short films (under 60 minutes).

CONCLUSION

The documentary film media on the human reproductive system, developed based on the inventory of medicinal plants for male reproductive health, shows validation results from all four aspects with very valid categories for use, with average values of 0.84 for format, 0.85 for content, 0.93 for language, and 0.91 for usage. Overall, the average score for these four aspects is 0.87. This indicates that the developed documentary film is suitable for use as a learning media.

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