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Hyzine Flipbook as an Innovative Digital Learning Media for the Reproduction Module: An Effort to Improve Student Learning Achievement.

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Abstrak:
Advancements in education alongside technological developments have given rise to numerous innovations and creative solutions, making it easier for people to carry out their activities. This study aims to determine the effectiveness of using Hyzine Flipbook-based modules in improving student learning achievement in reproductive anatomy and physiology material. This study is a Research and Development (R&D) project aimed at developing instructional materials in the form of reproductive anatomy and physiology modules based on a flipbook format by adopting a development model. The development procedure follows the ADDIE model, which includes the stages of analysis, design, development, implementation, and evaluation. This manuscript focuses on the analysis phase, particularly regarding the characteristics of the students. Data analysis was conducted using univariate analysis techniques. The study was carried out over approximately five months, from July 2024 to December 2024. The sample consisted of 32 respondents, who were medical students selected using a purposive sampling method. The research instruments included various data collection methods such as questionnaires, interviews, observations, and evaluations tailored to each research variable. Data were collected by asking respondents to complete a questionnaire that reviewed the characteristics of the students. A total of 45% of students reported using digital media daily, while 50% reported using digital media several times a week.

Keywords: Hyzine Flipbook, Digital Media, Reproductive Anatomy, Respondent Characteristics)

Introduction

Technological advancements, as observed across various fields, have significantly influenced educational systems (Yaghoobi & Razmjoo, 2016). Progress in education, alongside technological development, has given rise to numerous innovations and creative solutions, facilitating everyday activities for society (Anak Agung Meka Maharcika et al., 2021). With these advancements, technology has also been utilized as a tool to support instructional design (Ansrowi in Fahrezi & Mubarok et al., 2020). One of the benefits of using technology is its ability to provide a dynamic teaching and learning environment (Shatri, 2020).

The use of interactive teaching materials must be thoroughly prepared and designed comprehensively, from usage guidelines to assessment methods (Nurhadi & Nurhasnawati, 2022). According to previous research by Muhammad Chairad (2018), students often face difficulties in understanding anatomy and physiology materials due to a lack of adequate learning resources and engaging material presentation. Traditional modules tend to be static and less appealing, which affects students' interest and motivation to learn. Developing effective and innovative learning modules is crucial to supporting the learning process. Well-

designed modules can enhance students' learning achievement by presenting materials that are interactive, visual, and easy to understand.

The research findings indicate that students have a positive perception of the potential development and utilization of flipbooks as a learning medium (Roemintoyo & Budiarto, 2021). The use of flipbook learning media can support the creation of learning activities that encourage student engagement through differentiated principles, creating a diverse learning environment tailored to students' interests and needs (Tifani et al., 2024). The developed e-modules were able to enhance students' knowledge and learning outcomes (Muhaimin et al., 2024). Technology-based learning approaches, such as the Hyzine Flipbook, can be an effective solution (Elvianasti et al., 2023) The ability to present learning materials in the form of words, sentences, and images can capture students' attention, with added benefits of ease of use, low production costs, and portability. Another advantage of flipbooks is their ability to improve students' understanding of events that cannot be presented in the classroom (Elvianasti et al., 2023).

Another issue identified by researchers is the lack of learning resources in the Faculty of Medicine, with lecturers showing little initiative to develop learning materials that can serve as references for students. Although various studies highlight the benefits of using flipbooks and e-modules in learning, there remain research gaps that need to be addressed, such as evaluating the impact of learning media like the Hyzine Flipbook in local contexts or regions with limited technological infrastructure, such as Papua.

Therefore, this study aims to design an anatomy and reproductive physiology module based on the Hyzine Flipbook, with the primary goal of enhancing students' learning success. By presenting learning materials in a more engaging and interactive format, this module is expected to help students better understand the concepts of anatomy and reproductive physiology.

Literature Review

Teaching Module

Teaching modules play an important role in developing students' 21st-century skills in learning. In addition to serving as a source for students' independent learning (Febriana et al., 2020; Nurmeidina et al., 2020), teaching modules also play a key role in helping lecturers design their lessons (Pepin et al., 2017).

Concept and Components of Teaching Modules

Concept of Teaching Modules

1. A teaching module is a type of teaching tool that contains a lesson plan, designed to help guide the learning process in achieving the Learning Outcomes (LO).
2. If an educational institution uses the teaching module provided by the government, the module can be aligned with the RPP Plus, as it contains more comprehensive components than the RPP. If the institution develops the teaching module independently, it can be aligned with the RPP.
3. Educational institutions can use various teaching tools, including teaching modules or RPP, with different components and formats according to the characteristics and needs of the students.

Purpose of Developing Teaching Modules

The development of teaching modules aims to provide teaching tools that can guide teachers in carrying out the learning process.

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In its use, teachers have the freedom to:

1. Choose or modify the teaching module provided by the government to adjust it to the characteristics of the students, or
2. Develop their own teaching module according to the characteristics of the students

The criteria that a teaching module must have are:

1. Essential: understanding the concepts of each subject through learning experiences and interdisciplinary approaches.
2. Engaging, meaningful, and challenging: fostering interest in learning and actively involving students in the learning process; relating to prior knowledge and experiences, so it is not too complex, yet not too easy for their age level.
3. Relevant and contextual: connected to prior knowledge and experiences, and appropriate to the time and environment of the students.
4. Coherent: the alignment of learning activities with the students' learning phase.

Components of a Teaching Module

A teaching module must at least contain learning objectives, learning steps (which include the learning media to be used), assessment, as well as additional learning information and references that can assist teachers in carrying out the learning process. The components of the teaching module can be added based on the subject and its needs. Teachers in educational institutions are given the freedom to develop the components of the teaching module according to the context of the environment and the learning needs of the students.

(https://guru.kemdikbud.go.id/kurikulum/perkenalan/perangkat-ajar/konsep-komponen-modul-ajar/)

A quality module needs to consider the necessary characteristics of the module (Suastika & Wahyuningtyas, 2018), including: (a) Self-instruction; (b) Self-contained; (c) Stand-alone; (d) Adaptive; (e) User-friendly; (f) Consistency in font usage, spacing, and layout; (g) Having a clear writing organization.

Anatomy and Physiology of Reproduction

1. Human Reproductive Anatomy:

   Human reproductive anatomy includes the organs involved in the reproductive system, such as the ovaries, fallopian tubes, uterus, and vagina in females, as well as the testes, epididymis, vas deferens, and penis in males (Moore et al., 2019).

2. Human Reproductive Physiology:

   Human reproductive physiology encompasses the processes that occur within the reproductive system, such as the formation of sperm and ova, fertilization, implantation, and embryo development (Guyton & Hall, 2015).

3. Hormonal Regulation:

Hormonal regulation in the reproductive system involves hormones such as estrogen, progesterone, testosterone, FSH (follicle-stimulating hormone), and LH (luteinizing hormone), which influence the menstrual cycle, spermatogenesis, and other reproductive functions (Sadler et al., 2018).

4. Formation of Oocytes and Sperm:

   The process of oocyte formation (oogenesis) occurs in the ovaries, while sperm formation (spermatogenesis) takes place in the testes. Both processes involve mitosis, meiosis, and cell differentiation (Nugroho & Agustriyanto, 2020).

5. Menstrual Cycle:

   The menstrual cycle in women consists of phases such as menstruation, proliferation, ovulation, and secretion, which are regulated by complex hormonal changes (Guyton & Hall, 2015).

6. Environmental and Lifestyle Influences:

   Factors such as nutrition, smoking habits, exposure to certain chemicals, and stress can affect the function of the reproductive system in both men and women (Sathyanarayana et al., 2017).

Hyzine Flipbook

Heyzine flipbook is a free online PDF to flipbook converter website that provides an electronic book effect, allowing each page to be turned like a real book. The advantage of the flipbook e-module, compared to printed modules, is that it doesn't just consist of words or images, which can sometimes make students bored or struggle to understand the content. Instead, it includes various engaging elements such as videos, songs, audio, animations, or moving graphics, which can be integrated into the e-module. These features make the e-module more appealing, encouraging students to read and study it (Aror et al., 2020). In addition, by using Heyzine flipbook, students can easily access the e-module anytime and anywhere using their mobile phones. The teacher can share a link, and students can open it or even download it for free. (Rahmawati, 2017).

Research Methodology

This study is a research and development (R&D) project that develops teaching materials in the form of a flipbook-based anatomy and physiology module, adapting a development model. The development procedure refers to the ADDIE model, which stands for Analyze, Design, Develop, Implement, and Evaluate.

The concept of the ADDIE model is applied to build foundational performance in learning, specifically in developing a learning product design (Junaedi, 2019). The stages in the ADDIE development model are analysis, design, development, implementation, and evaluation. According to Pribadi (2016), the ADDIE learning model is used to design and develop learning programs that consist of analysis, design, development, implementation, and evaluation

Results

Analysis of Student Characteristics

Table 1. Frequency Distribution of Student Characteristics Based on Gender

Gender	Frequency (n)	Percentage (%)
Male	10	31.3
Female	22	68.7

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Total	**32**	**100**

The total 32 of respondents, the majority are female, with 22 people or 68.7%, while males account for 10 people or 31.3%. This indicates that female participation is higher than male participation in this group. Overall, females dominate the respondent population.

Table 2. Frequency Distribution of Student Characteristics Based on Age

Age	Frequency (n)	Percentage (%)
≤20 years	25	78.1
21-25 years	6	18.8
>25 years	1	3.1
Total	**32**	**100**

The majority of respondents are aged 20 years and younger, with 25 people or 78.1%. The age group of 21-25 years includes 6 people or 18.8%, while only 1 person or 3.1% is over 25 years old. This indicates that most respondents are in the younger age range, particularly under 20 years old.

Table 3. Frequency Distribution of Student Characteristics Based on Technology Usage

Variabel	Frequency (n)	Percentage (%)
Use of Digital Media in Learning		
Yes	**3**	**9.4**
No	**29**	**90.6**
	32	**100**
Frequency of Use		
Every Day	29	90.6
Several Times a Week	2	6.3
Occasionally	1	3.1
	32	**100**
Skill Level in Using Applications		
Skilled	**23**	**71.9**
Fairly Skilled	**6**	**18.8**
Less Skilled	**3**	**9.4**
	32	**100**
Use of Learning Devices		
Laptop	12	37.5
Smartphone	17	53.1
Tablet	2	6.3
Others	1	3.1
	32	**100**
Preferences in Using Learning Media		
Printed Books	2	6.3
Digital Media	19	59.3
Combination of Both	11	34.4
	32	**100**
Comfort in Using Digital Media		
Comfortable	19	56.3

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Fairly Comfortable	4	12.5
Very Comfortable	10	31.2
	32	**100**

The majority of respondents (90.6%) do not use digital media in learning, although 90.6% of them use digital media every day. About 71.9% feel skilled in using applications for learning, with the most commonly used device being a smartphone (53.1%), followed by a laptop (37.5%). Regarding learning preferences, 59.3% prefer digital media, and 56.3% feel comfortable using it. This indicates a strong tendency toward the use of digital media, although a small portion still relies on printed media or a combination of both.

Table 4. Frequency Distribution of Student Characteristics Based on Learning Style

Learning Style	Frequency (n)	Percentage (%)
Auditory (listening)	4	12.5
Visual (seeing images/videos)	2	6.1
Kinesthetic (hands-on practice)	16	50
Mixed	10	31.3
Total	**32**	**100**

The majority of respondents (50%) have a kinesthetic learning style, meaning they prefer to learn through hands-on practice. About 31.3% chose a mixed learning style that combines several methods. The auditory learning style was selected by 12.5% of respondents, while the visuallearning style was the least chosen, with only 6.1%. This indicates that most respondents tend to learn more effectively through practical methods rather than just listening or seeing

Table 5. Frequency Distribution of Student Characteristics Based on Motivation to Learn the Reproductive Module

Motivasi Belajar Modul Reproduksi	Frequency (n)	Percentage (%)
Very High	12	37.5
High	15	46.9
Adequate	5	15.6
Total	**32**	**100**

The majority of respondents have high motivation to learn the reproductive module, with 46.9% showing a "High" level of motivation and 37.5% having a "Very High" level of motivation. Only 15.6% of respondents showed "Adequate" motivation. Overall, this data reflects strong enthusiasm for learning the reproductive module among the respondents.

Discussion

Based on the data analysis results, the majority of respondents showed a strong preference for using digital media in learning, with 90.6% using it every day and 59.3% choosing digital media as their primary learning tool. Additionally, most respondents feel skilled (71.9%) in using digital applications, which reinforces the relevance of digital media as a learning tool. Regarding devices, smartphones (53.1%) and laptops (37.5%) are the most widely used, reflecting the need for learning media that can be accessed through these devices..

The kinesthetic learning style (50%) that dominates among the respondents indicates that learning based on hands-on practice is highly needed. Additionally, the motivation to learn the reproductive module is very high, with 46.9% having "High" motivation and 37.5% having "Very High" motivation, signaling the students' interest and enthusiasm for the material.

Considering the high motivation, skills in using digital applications, and the tendency toward kinesthetic learning styles, research on Hyzine Flipbook as an Innovation in Digital Learning Media for the Reproductive Module becomes crucial. This innovation is expected to enhance student engagement, provide interactive learning media that align with their preferences and learning styles, and support overall learning success. Digital flipbooks, which can combine visual elements and hands-on practice, have the potential to be an effective tool for improving the understanding of reproductive material, in line with the current needs of students..

The effectiveness of digital modules in education has been proven in various studies, which indicate the positive impact of using digital media on learning outcomes and student engagement. Digital modules are typically equipped with multimedia elements, such as the use of images, videos, sounds, and animations. Research findings show that the use of digital media has a significant influence on students' learning success. This is evident from several indicators, including improved material comprehension. The use of digital media is able to visualize the reproductive process interactively, such as through text, images, and videos, which helps students understand complex concepts more easily. According to Matos (2023), digital competence is crucial for future healthcare professionals, with the use of digital health modules leading to significant knowledge gains for students.

The ease of accessibility allows students to access material anytime and anywhere, enabling more flexible learning and aligning with individual learning speeds. Sulikah et al. (2024) state that the use of digital modules facilitates easy access to learning material, increasing student interest and participation. Furthermore, the increased interest in learning using digital media is also influenced by the visually appealing and interactive display, encouraging students to be more active in exploring the material. This effectiveness aligns with Mayer's multimedia learning cognitive theory (2009), which states that the combination of text, images, and interactivity can enhance cognitive processes in learning.

The research results indicate that students prefer using digital media over printed books. They also feel comfortable using these digital modules. This suggests that students are more actively engaged during the learning process when using digital modules.

An improvement in students' learning outcomes is supported by Saragih et al. (2024), who stated that the application of a contextual approach in electronic modules has shown significant improvements in learning outcomes, particularly in science subjects. Digital modules developed using the ADDIE model have demonstrated high validation scores, with one study reporting a validation score of 91% (Ismail et al., 2024.

Conclusion

Based on the survey data, the majority of students use digital media regularly in the learning process. About 45% of students reported using digital media every day, indicating a high dependence on technology in their learning activities. The daily use of digital media reflects how digital tools have become an integral part of facilitating learning, whether for accessing materials, interacting with visual content, or communicating with lecturers and fellow students. The majority of others, 50%, reported using digital media several times a week.

This suggests that digital media may be used strategically for specific topics or learning sessions, providing flexibility in combining various learning methods, both digital and non-digital. Only a small number of students reported using digital media less frequently, such as a few times a month. This indicates that for a small group of students, digital media is still considered a supplement to their primary learning methods.

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