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Development of MELUKIS (Mari Mengenal Struktur Virus): A Learning Assessment Book on Viruses for Grade 10 Students at Insan Cendekia Syech Yusuf Senior High School

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ABSTRAK

Penelitian pengembangan ini bertujuan untuk mengetahui tingkat kevalidan dan tingkat kepraktisan pada media evaluasi pembelajaran Buku Mari MELUKIS pada materi virus kelas X SMA Insan Cendekia Syech Yusuf. Metode yang digunakan peneliti dalam penelitian ini yaitu metode penelitian dan pengembangan atau research and development (R & D). Metode ini mengacu pada model ADDIE yang terdiri dari lima tahapan yaitu 1) analisis, 2) perancangan, 3) pengembangan, 4) implementasi dan 5) evaluasi. Subjek penelitian ini sebanyak 20 orang peserta didik di kelas X SMA Insan Cendekia Syech Yusuf. Instrumen dalam penelitian ini adalah pedoman wawancara, lembar validasi, dan angket uji kepraktisan. Hasil validasi media sebesar 3,63 yang berada pada kategori sangat valid. Penilaian respon uji kepraktisan melalui angket sebesar 83,29% berada pada kategori sangat praktis. Implikasi penelitian ini adalah tersedianya media evaluasi pembelajaran Buku Mari MELUKIS yang dapat mengefektifkan pembelajaran dan pendalaman materi melalui soal evaluasi yang beragam, terutama pada materi virus.

ABSTRACT:

This development study aimed to determine the validity and practicality of Buku Mari MELUKIS as a learning assessment medium for the topic of viruses in Grade 10 at Insan Cendekia Syech Yusuf Senior High School. The study employed a research and development (R&D) method based on the ADDIE model, which comprises five stages: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. The participants were 20 Grade 10 students at the school. The research instruments consisted of an interview guide, a validation sheet, and a practicality questionnaire. The media received a validation score of 3.63, placing it in the very valid category. Responses to the practicality questionnaire yielded a score of 83.29%, placing the media in the very practical category. This study provides a learning assessment medium that may support more effective instruction and deeper content understanding through a variety of assessment questions, particularly on the topic of viruses.

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Introduction

Alongside advances in information and communication technology (ICT), education continues to evolve dynamically, particularly in the development of interactive, inspiring, enjoyable, challenging, and motivating learning media, methods, strategies, and processes. Learning media are

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needed to support the instructional process. They are also integral to teaching methods because they can help present information to students more accurately, clearly, and engagingly. Developing learning media is one way to improve the quality of instruction and, ultimately, students' learning outcomes (Warsita, 2013).

Practical and engaging learning media can help teachers deliver content and assess the extent to which learning outcomes have been achieved. Innovation in teaching through the use of technology, including assessment tools, is needed to support education (Dwijayanti, 2022). Learning media can be developed through instructional development procedures that include design, production, and formative evaluation (Suparman, 2004).

Evaluation is an important stage in the development of learning media. It is needed to assess product quality and ensure that the media can fulfill its intended function in achieving learning objectives. Accordingly, media development should be systematic and learner-centered. In general, the development of learning media comprises three stages: design, production, and evaluation (Warsita, 2013).

Media also serve as a means of nonverbal communication in learning. Their use can support student participation through activities such as listening, observing, writing, sensing, and thinking (Magdalena et al., 2021).

Issues concerning the use of assessment media were identified in Grade 10 Biology classes at Insan Cendekia Syech Yusuf Senior High School. Based on an interview with a teacher on January 26, 2024, and a questionnaire administered to students, instruction on viruses still relied on lectures and student worksheets with monotonous layouts and question formats. The teacher reported that these conditions made it difficult for students to remain focused while completing the worksheets. Students also showed low levels of reading interest and classroom participation, limiting interaction and feedback during instruction. These findings indicate a need for more engaging assessment media suited to the topic of viruses.

Several studies have developed learning media for the topic of viruses. Darmawan and Nawawi developed interactive learning media accompanied by student worksheets to support the presentation of virus-related content and assessed its feasibility through expert review. Jirana et al. (2024) developed a mind map-based pocketbook that presents virus-related content concisely and evaluated its validity, practicality, and effectiveness. Irfan et al. (2024) developed Android-based learning media using Smart Apps Creator for the Grade 10 virus topic and evaluated its validity, practicality, and effectiveness.

These studies focused on presenting content through interactive media, a pocketbook, and a digital application. Based on the studies reviewed, there appears to be little research specifically focused on a printed assessment book containing virus-related questions presented in an engaging and challenging format. This gap indicates the need for assessment media distinct from the content-

presentation media developed in previous studies. The present study addresses this need by developing MELUKIS (Mari Mengenal Struktur Virus; "Let's Learn About Virus Structure"), an assessment book for Grade 10 students at Insan Cendekia Syech Yusuf Senior High School.

An assessment book can engage students' interest and make classroom activities more active. It can also encourage students to think more creatively, making it suitable for Biology instruction, particularly for the topic of viruses. By providing visual and textual stimuli, the media can stimulate students' imagination. The book contains assessment activities on viruses and presents questions in an engaging and moderately challenging format, accompanied by text and images that align with the topic.

The novelty of this study lies in the development of MELUKIS as a printed assessment book containing questions on viruses, presented in an engaging and challenging format and designed in response to the needs of Grade 10 students at Insan Cendekia Syech Yusuf Senior High School. In light of the identified problem and research gap, this study aimed to develop MELUKIS as a learning assessment medium for the topic of viruses for Grade 10 students at the school.

Methodology

The researchers used the ADDIE model, an acronym for Analyze, Design, Develop, Implement, and Evaluate. The model provides a foundational framework for designing and developing instructional products. ADDIE is an instructional design model centered on individual learning. It comprises immediate and long-term phases, follows a systematic process, and applies a systems approach to human knowledge and learning (Hidayat, 2021, p. 29).

The ADDIE model consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The Analysis stage identifies the problem, needs, user characteristics, subject matter, and development objectives. The Design stage translates the analysis findings into a product plan, including its objectives, content, structure, media format, and evaluation plan. During Development, the design is translated into a product, which is then assessed and revised based on relevant feedback. Implementation involves applying or testing the product with users in the specified context. Finally, Evaluation assesses the quality of both the product and the development process and determines improvements based on established criteria (Branch, 2009).

The learning assessment book Mari MELUKIS on the topic of viruses was piloted at Insan Cendekia Syech Yusuf Senior High School, located on Pattallassang Street, Pattallassang District, Gowa Regency, South Sulawesi Province. The product was tested with Grade 10 students. Interviews are one method of data collection in research. They involve direct interaction between the researcher and participants to understand their experiences, perceptions, and views on a particular topic (Ardiansyah, Risnita, & Syahran, 2023). Questionnaires consist of questions

administered to a sample to obtain responses that can be presented as statistical values (Gumilar & Yoni, 2021). Data analysis was conducted to assess the product's validity and practicality. Validity was assessed by two expert reviewers. The validity assessment criteria are presented in Table 1.

Table 1
Validity Criteria

Mean score ($\bar{x}$)	Criterion
$\bar{x} > 3.4$	Very valid
$2.8 < \bar{x} \leq 3.4$	Valid
$2.2 < \bar{x} \leq 2.8$	Moderately valid
$1.6 < \bar{x} \leq 2.2$	Less valid
$\bar{x} < 1.6$	Invalid

The practicality criteria, based on the mean percentage of respondents' responses, are presented in Table 2.

Table 2
Practically Criteria

Score	Criterion
82 – 100%	Very practical
61 – 80%	Practical
41 – 60 %	Moderately practical
21 – 40%	Less practical
0 – 20%	Not practical

Results and Discussion

Development Stage

The Mari MELUKIS assessment book was developed using the ADDIE model, which consists of five stages: (1) Analysis, (2) Design, (3) Development, (4) Implementation, and (5) Evaluation (Sugihartini & Kadek, 2018). The Analysis stage aims to identify the potential causes of a gap in learning performance (Hidayat, 2021). The researchers identified and analyzed the competency standards and basic competencies required for developing the Mari MELUKIS learning assessment book. This stage involved preliminary analysis, task analysis, concept analysis, and the specification of learning objectives.

The Design stage builds on the findings of the analysis. The researchers designed the media by: (a) identifying its intended users; (b) specifying the competencies and indicators of understanding that students were expected to achieve through its use; (c) designing the media to support the achievement of those competencies and indicators in the digital communication and

learning simulation course during the current semester; and (d) determining the expected level of student mastery after using the media. These activities were intended to help teachers present information and instructional content (Fitriyah, Iskandar, & Ibut, 2021).

The next stage, Development, involved validation, revision based on expert feedback, and product testing (Fadhila et al., 2022). The validators' assessments and comments guided revisions to the components of the learning media that required improvement. Following evaluation of the initial product, the revised version of Prototype 1 was designated Prototype 2 and tested on a limited basis. The learning media developed at this stage is referred to as Prototype 2. The results of this stage are shown in Figures 1 and 2.



Figure 1. Cover of the Mari MELUKIS Learning Assessment Book

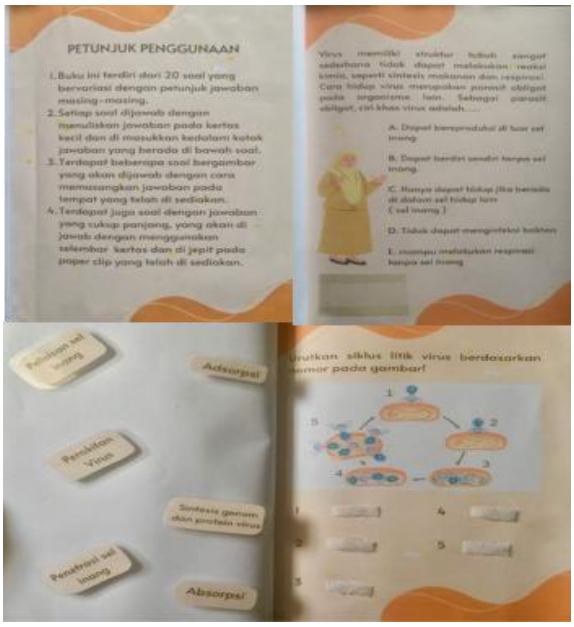


Figure 2. Inside Pages of the Mari MELUKIS Learning Assessment Book

Media Validity

The Mari MELUKIS assessment book achieved a mean validity score of 3.63, classified as very valid, as shown in Table 3.

Table 3
Assessment by Validators I and II

Aspect assessed	Validator I	Validator II	Mean	Category
The appearance of the Mari MELUKIS book	3.8	3.5	3.65	Very valid
Content of the Mari MELUKIS book	3.3	3.6	3.45	Very valid
Image quality and color suitability	3.6	3.3	3.4	Valid
Language use	4.0	4.0	4.0	Very valid
Ease of use	3.6	3.6	3.6	Very valid
Overall mean	3.66	3.6	3.63	Very valid

Validity in research refers to the extent to which a research instrument accurately represents the content it is intended to measure (Supriyadi, 2022). It also refers to the degree to which an instrument measures what it is intended to measure (Sanaky, La, & Henriette, 2021). Product validation can be conducted by inviting experts or experienced professionals to assess a newly designed product.

The validity assessment covered several indicators or aspects. The first concerned the media's appearance. The media has a rectangular format, consistent with its identity as the Mari MELUKIS assessment book. Its design combines a light brown background with orange elements on the cover and inside the book. Orange conveys warmth and enthusiasm and symbolizes adventure, confidence, and social skills (Sasongko, Suyanto, & Mei, 2020). Light brown was selected as a neutral background color that creates a warm and calm impression (Rizal et al., 2022). This choice is consistent with the view that color use in learning can affect students' short-term memory and may be associated with improved biopsychological functioning, concentration, interest in learning, reduced anxiety, greater imagination and creativity, productivity, and better retention when completing cognitive tasks (Damayanti et al., 2020). Font selection is also important to the media's visual appeal. A font is a set of characters in a particular size and style within a typeface. Understanding typefaces is essential in the design process to produce a design that is effective both visually and functionally (Nugroho, Rondhi, & Rahina, 2019).

The second indicator concerned the content of the Mari MELUKIS assessment book. The instructional material in the book aligns with the learning objectives for the topic of viruses in the lesson plan under the Merdeka Curriculum. A variety of assessment questions were developed to

prevent students from becoming bored with repetitive assessment activities using student worksheets. This approach is consistent with the view that repeated exercises can become monotonous and tiresome; therefore, they should be presented in engaging ways, including through the use of learning media (Listiani & Erlina, 2018).

The third indicator concerned image quality. Image quality can affect how effectively a teacher's message is conveyed to students during instruction. Images related to learning content can communicate messages from teachers to students and help students identify information in a problem, making the relationships among its components clearer (Magdalena et al., 2021).

The next indicator concerned language use. Language is important in learning because instructional activities are fundamentally concerned with engaging learners in the learning process (Wicaksono, 2016). Appropriate language that follows established conventions is essential for communicating ideas and information clearly and accurately. In Indonesian, the Ejaan yang Disempurnakan (EYD; Enhanced Indonesian Spelling System) provides the principal guidelines for spelling and grammar, including the use of letters, punctuation, and loanwords. Issued by the Language Development and Cultivation Agency, EYD serves as an official reference for correct written Indonesian (Lena et al., 2023).

The final indicator concerned ease of use, which refers to how easily users can operate the learning media (Marto & Yulianti, 2022). The Mari MELUKIS assessment book supports ease of use by providing instructions within the book and using a practical size that makes it easy to carry.

Media Practically

The Mari MELUKIS assessment book received a practicality score of 83.29%, placing it in the very practical category. This result indicates that the book is practical for use in learning. According to Sugiyono (2014), a score between 82% and 100% is classified as very practical. The response data are presented in Table 4.

Table 4
Overall Response Results

No	Assesment Type	Mean
1	Students responses	75.58%
2	Teacher responses	91.00%
	Overall mean	83.29%
	Assesment Category	Very practical

Conclusion

The Mari MELUKIS learning assessment book was developed using the ADDIE model, which comprises five stages: (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. The media achieved a validity score of 3.63, indicating that it is suitable for use, and a practicality score of 83.29%, indicating that it is very practical. One limitation of this study is that the assessment book is available only in printed form and is not integrated with digital technology. This limitation may be considered in future development of the media.

References

Ardiansyah, Risnita dan M. Syahran Jailani. (2023). Teknik Pengumpulan Data dan Instrumen Penelitian Ilmiah Pendidikan Pada Pendekatan Kualitatif dan Kuantitatif. IHSAN: Jurnal Pendidikan Islam, 1(2).

Damayanti, Eka, et al. (2020). Penggunaan Warna Terhadap Memori Jangka Pendek: Pendekatan Biopsikologi dalam Pembelajaran. GUIDEMA: Jurnal Ilmu Pendidikan, Psikologi, Bimbingan dan Konseling, 10(2), 99-112.

Dwijayanti, Hikmah. (2022). Pengembangan media evaluasi pembelajaran. Universitas sebelas Maret. Jurnal pendidikan Geografi UNS, 2(1).

Fadhila, Nadia Alima, et al. (2022). Pengembangan Bahan Ajar Menggunakan Model ADDIE Pada Materi Struktur dan Fungsi Jaringan Tumbungan SMA Kurikulum 2013. BIOEDUKASI Jurnal pendidikan Biologi, 13(1).

Fitriyah, Ida, Iskandar Wiryokusumo dan Ibut Priono Leksono. (2021). Pengembangan Media Pembelajaran PREZI Dengan Model ADDIE Pada Mata Pelajaran Simulasi dan Komunikasi. Jurnal Inovasi Teknologi Pendidikan, 8(1).

Gumilar, Rendra dan Yoni Hermawan. (2021). Peningkatan Kemandirian Belajar Melalui Metode E-LEARNING. Jurnal Edukasi: Ekonomi, Pendidikan dan Akuntansi, 9(1).

Hidayat, Fitria. (2021). Model ADDIE Dalam Pembelajaran Pendidikan Agama Islam. Jurnal Inovasi Pendidikan Agama Islam, 1(1).

Kaniawati, Elsa et al. (2023). Evaluasi Media pembelajaran

Lena, Mai Sri, et al. (2023). Analisis Penerapan EYD Dalam Sebuah Karya Ilmiah. Jurnal Pendidikan Bhinneka Tunggal Ika, 1(5), 199-206.

Listiani, Desi dan Erlina Prihatnani. (2018). Pengembangan Media Pembelajaran Dart Board Math Bagi Siswa Kelas VII SMP. Jurnal Pendidikan Matematika, 4(1), 21-33.

Magdalena, Ina, et al. (2021). Penggunaan Media Gambar Dalan Meningkatkan Minat Belajar Siswa Kelas IV di SD NEGERI 09 KAMAL PAGI. Jurnal Pendidikan dan Ilmu Sosial, 3(2), 334-346.

Marto, Hasia dan Yulianti. (2022). Efektivitas Penggunaan Media Pembelajaran Informatika di SMK NEGERI 1 TOLITOLI. Jurnal Teknologi Pendidikan Masako, 1(1), 18-24.

Nugroho, Dany Prasetyo, Moh Rondhi dan Rahina Nugrahani. (2019). Ragam Hias Pada Candi Gedong Songk Semarang Sebagai Inspirasi Perancangan Typeface. Arty: Jurnal Senin Rupa, 8(2).

Rizal, Nur Adina, et al. (2022). Pengembangan Media Pembelajaran Suprise Box Pada Materi Sistem Reproduksi Kelas IX SMPN Satap Katumbangan. Al-Ahya: Jurnal Pendidikan Biologi, 4(1), 28-38.

Sanaky, Musrifah Mardiani, La Moh. Saleh dan Henriette D. Titaley. (2021). Analisis Faktor-faktor Penyebab Keterlambatan Pada Proyek Pembangunan Gedung Asrama MAN 1 TULEHU MALUKU TENGAH. Jurnal Simetrik, 11(1).

Sasongko, Muhammad Nurcahyo, M. Suyanto dan Mei P. Kurniawan. (2020). Analisis Kombinasi Warna Pada Antarmuka Website Pemerintah Kabupaten Klaten. Jurnal Teknologi Technoscientia, 12(2).

Sugihartini, Nyoman dan Kadek Yudiana. (2018). ADDIE Sebagai Model Pengembangan Media Instruksional Edukatif (MIE) Mata Kuliah Kurikulum dan Pengajaran. Jurnal Pendidikan Teknologi dan Kejuruan, 15(2).

Suparman, M. Atwi. (2004). Desain Instruksional. Jakarta: Pusat penerbitan Universitas terbuka.

Supriyadi. (2020). Evaluasi Pembelajaran. Jawa Tengah : PT Nasya Expanding Management.

Warsita, Bambang. (2013). Evaluasi Media pembelajaran sebagai pengendalian kualitas. Wicaksono, Luhur. (2016). Bahasa Dalam Komunikasi Pembelajaran. Jurnal Pembelajaran Prospektif, 1(2), 9-19.