

Development in the Flipbook-based E-Module Learning Media for Volleyball Game Material for the Eighth Grade Students of Junior High School

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ABSTRACT: This research aims to: (1) produce a flipbook-based e-module learning media for volleyball game material for eighth grade students of junior high school, (2) determine the feasibility of a flipbook-based e-module learning media for volleyball game material for eighth grade students of junior high school, (3) determine the practicality of a flipbook-based e-module learning media for volleyball game material for eighth grade students of junior high school. This research was a research and development (R&D) study with the ADDIE approach model with research steps consisted of: 1) Analyze, 2) Design, 3) Development, 4) Implementation and 5) Evaluation. Product validation was carried out by 2 material experts and 2 media experts. The research subjects were teachers and students. The subjects of the teacher response trial involved 3 Physical Education teachers at the junior high school level. The small-scale trial consisted of 22 eighth grade students of SMP Negeri 2

Batauga. The research subjects of the large-scale trial were carried out by involving 41 eighth grade students of SMP Negeri 2 Sampolawa (Sampolawa 2 Junior High School). The research instruments used a product feasibility sheet and a product practicality sheet. The data were analyzed by using descriptive analysis techniques. The research findings reveal that the product's feasibility, based on the assessment of 2 material experts, is in the "feasible" category. The product's feasibility, based on the assessment of 2 media experts, is in the "very feasible" category. The results of the teacher response trial are in the "very feasible" category. The small-scale trial result in a "very good" or "very practical" category. The large-scale trial result in a "very good" or "very practical" category. Therefore, it can be concluded that the developed product is feasible and practical for use as a learning medium for volleyball.

KEYWORDS: Learning Media, E-Module, Flipbook, Volleyball

I. INTRODUCTION

The use of technology as a medium in the learning process signifies progress in achieving academic goals. The use of technological media in education can accelerate the learning process, enabling educators to optimise teaching time, reduce the burden of disseminating information, focus on guidance, increase learner engagement, and offer opportunities for individualised learning (Masjudin, 2020, p. 42). Smartphones are a technological innovation that is commonplace in society today. The widespread ownership of smartphones and the significant engagement they generate illustrate their potential as a learning medium that deserves recognition and implementation within educational settings. Research conducted by (Nurningtyas & Ayriza, 2021, p. 18) indicates that adolescents aged 15–18 in Yogyakarta largely demonstrate moderate self-control and extensive smartphone use, with the majority of participants using social media. Asif et al. (2017, p. 153) identified a strong association ($p=0.002$) between gadget addiction and emotional and behavioural problems in adolescents aged 11–12 years. In the learning process, teachers play a vital role in delivering instruction that facilitates learners in achieving learning objectives (Nurzannah, 2022, p. 33)

Nurrita (2018, p. 184) emphasises that advances in educational media are crucial for improving pupils' learning outcomes. Educational media enhance the learning process, increase the efficiency of pupils' learning, and provide a comprehensive learning experience. During the learning process, teachers must present learning materials through engaging media that align with technological advancements and requirements, enabling learners to participate in self-directed learning anywhere and at any time via their mobile devices. The Ministry of National Education (2008), cited in (Muhammad, 2018, p. 65), states that: 'Physical education, sport and health are fundamental elements of holistic education, which aims to improve physical fitness, motor skills,

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critical thinking, social skills, reasoning, emotional stability, moral behaviour, a healthy lifestyle and environmental awareness through physical activities, sport and health that are systematically structured and organised to fulfil national educational objectives.'

The requirements of the 'Merdeka' curriculum offer children the opportunity to learn according to their abilities, fostering creativity, innovation and character, whilst enhancing social skills, problem-solving abilities and leadership (Sari & Kurniawati, 2024). Physical Education (PJOK) within the independent curriculum requires educators to provide meaningful, learner-centred learning experiences and to utilise new educational technologies to achieve the learning objectives of physical education. However, the implementation of this aspect often faces challenges in practice. These challenges arise from a lack of development in digital learning media, leading to a mismatch with learners' characteristics, thereby hindering learners' understanding of the subject matter when using traditional teaching methods (Denisa & Astimar, 2024, p. 779). Obstacles in this learning process will inevitably affect the realisation of these elements. Self-directed learning demonstrates learners' ability to participate actively in the educational process, thereby not relying on others to achieve their learning objectives (Dewi et al., 2020, p. 49). Learners who demonstrate strong independent learning have the ability to assess and take the initiative in problem-solving, possess a sense of responsibility, and do not rely on others to fulfil their tasks.

Based on the results of observations and interviews with teachers at Batauga State Junior High School No. 2 regarding the physical education learning process, particularly in relation to volleyball, a number of challenges were identified, including: (1) the learning resources used are limited to textbooks and an LCD projector; (2) limited facilities and equipment for volleyball; (3) a lack of understanding among teachers regarding the development of technology-based teaching materials, (4) insufficient use of technology as a teaching tool applied to physical education, particularly in volleyball lessons, (5) a lack of knowledge regarding volleyball, and (6) the absence of a teaching resource in the form of a flipbook-based e-module on volleyball for Year 8 secondary school students. As teachers, we must realise that the use of media facilitates the explanation of subject matter to students. Teachers' limited ability to develop media is one of the factors contributing to the scarcity of technology-based learning media in schools. Marini et al. (2024, p. 44) report that the 2023 APJII survey revealed a smartphone penetration rate of 98.20% among adolescents aged 13 to 18 years. This indicates that smartphone use is quite prevalent among junior high school students. Teachers should capitalise on this situation to innovate and develop learning media.

One alternative to addressing the above issues is the use of engaging self-directed learning resources to be used as supplementary teaching materials in the learning process. One such learning resource that can be utilised is the e-module. An emodule, or electronic module, is a learning resource containing lesson content, text, images and exercise questions packaged in electronic form to achieve specific learning objectives. The development of these e-modules is essential to facilitate teachers' and students' learning and teaching. Furthermore, these e-modules can be used for home study as a substitute for printed books (Awwaliyah et al., 2021). The advantages of e-learning modules include the combination of images and videos, which can enhance engagement and facilitate students' understanding of the information. Widiana & Rosy (2021) state that the benefit of using e-modules is that students can learn independently, even without a teacher's supervision.

One interesting form of e-module to develop is the flipbook-based e-module. A flipbook is a digital medium that displays book pages with a 'flip' effect, just like turning the pages of a physical book. The use of flipbook-based e-modules can provide a more engaging and interactive experience for learners due to their design, which resembles a physical book but incorporates multimedia elements that can enrich the learning content. The advantage of flipbook media compared to other media is that it presents a combination of text, animation, video, sound and so on (Ayuardini, 2022). The same point is made by Ardiansyah & Ridwan (2023), who state that the advantages of flipbook media include the presentation of material in the form of images, words, sentences, and animations, supported by a variety of colours, making it easier to engage learners in the learning process.

II. RESEARCH AND METHOD

This study is a research and development (R&D) project. Research and development is a systematic procedure used to produce a specific product and assess its effectiveness (Sugiyono, 2017). This study employs the ADDIE framework, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). The strength of the ADDIE model lies in its systematic process, in which each step refers back to the previous stage, thereby producing a better and more effective product (Suryani et al., 2018). This study developed a flipbook-based electronic module as a learning resource for volleyball, intended for Year 8 secondary school pupils.

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The subjects and respondents in this study comprised subject matter experts and media experts, as well as teachers and students. The subject matter experts and media experts were lecturers with expertise in their respective academic fields regarding the developed product, namely a flipbook-based e-module. The pilot study to assess teachers' responses to the developed product involved Physical Education, Sport and Health teachers teaching at lower secondary school level. The smallscale trial in this study involved 22 students from Year 8 at SMP Negeri 2 Batauga, whilst the large-scale trial was conducted in Year 8 Class A at SMP Negeri 2 Sampolawa with 22 students and Year 8 Class B with 19 students. The data obtained from this study were analysed using descriptive statistics. Descriptive statistical analysis is a statistical method used to analyse collected data as it is, without drawing general conclusions or making generalisations (Sugiyono, 2017).

III. RESULTS AND DISCUSSION

This research and development of a flipbook-based e-module on volleyball for Year 8 pupils was carried out using the ADDIE model, which comprises several stages: Analysis, Design, Development, Implementation and Evaluation. These stages are explained as follows:

A. Analysis Stage

Needs analysis is a step taken to identify what is required to support the product development process. This process was carried out through interviews with Physical Education, Sport and Health (PJOK) teachers, with the aim of obtaining information regarding the curriculum and materials used in schools, particularly in relation to volleyball. Furthermore, the aim was to understand how pupils learn about volleyball and the teaching aids used during the learning process. Based on the results of interviews with Physical Education teachers at SMP Negeri 2 Batauga, it was found that the learning process already utilises the Merdeka Curriculum, and the learning media used are limited to textbooks and LCD projectors. On the other hand, the volume of material covered by the Merdeka Curriculum, combined with limited time, makes it difficult for teachers to deliver comprehensive instruction, resulting in a low level of mastery among students regarding the basic techniques of volleyball.

The curriculum analysis stage was carried out to identify the curriculum used in the learning process. Based on the results of interviews conducted during the needs analysis stage, it was established that the curriculum implemented at the school is the Merdeka Belajar Curriculum. This curriculum affords learners the freedom to achieve quality learning in line with their needs and learning environment. Learning Outcomes (LO) and Learning Objectives (LO) serve as the benchmark for the development of a flipbook-based e-module on volleyball for Year 8 students at lower secondary school.

The stage of analysing learner characteristics is necessary to identify learners' initial conditions, learning experiences and needs within the learning process. This analysis was conducted through interviews with learners regarding their learning experiences in volleyball using learning media, as well as their interest in technology-based media. The analysis revealed that, whilst the students were already familiar with volleyball, their understanding of the sport was fairly limited; the use of technology in learning was also quite limited; furthermore, electronic modules had never been used in the learning process. On the other hand, the students demonstrated an interest in learning materials presented in the form of flipbook-based e-modules. During the learning process, teachers generally permitted the use of smartphones, primarily for searching for information and accessing supplementary materials. From these findings, it can be assumed that students require engaging learning materials that can be accessed anytime and anywhere, thereby enhancing their understanding and fostering independent learning. The development of flipbook-based e-module learning materials on volleyball is deemed appropriate to meet the students' needs.

B. Design Stage

Following the analysis phase, the process moves on to the design phase. During this phase, the e-module is designed, which involves a number of activities, including defining the Learning Outcomes (LO) and Learning Objectives as previously explained, creating a storyboard for the e-module, and compiling the material into a Microsoft Word document.

C. Development Stage

The steps involved in this stage are to develop a flipbook-based e-module on volleyball based on the previously designed layout. Activities in this stage include: a) designing the e-module using the Canva application, b) selecting a template suitable for the volleyball module being developed, c) transferring the collected volleyball material into the specified Canva template, d) converting the volleyball game e-module designed in Canva into the Heyzine flipbook application, and e) validation by the Subject Matter Expert and Media Expert. The results of the Subject Matter Expert's validation of the developed product can be seen in Table 1 below.

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Table 1. Results of Material Expert Validation

No.	Aspect	Validator Assessment		Maximum Value	On average	Category
		Lecturer 1	Lecturer 2			
1	Learning	19	20	20	19.5	Very Worthy
2	Material	30	24	32	27	Worthy
3	Language	19	15	20	17	Worthy

The results of the subject matter expert validation regarding the learning aspect yielded an average score of 19.5 out of a maximum of 20, falling into the 'highly suitable' category. This indicates that, from the learning aspect, the material presented is highly aligned with the learning outcomes and can enhance learners' understanding. Subsequently, the results of the subject matter expert validation on the content aspect yielded an average score of 27 out of a maximum of 32, falling into the 'acceptable' category. This indicates that the material presented in the e-module is suitable for use as teaching material in volleyball instruction. Finally, the results of the content validation regarding the language aspect showed an average score of 17 out of a maximum of 20, falling into the 'acceptable' category. The results indicate that the language used in the volleyball-based flipbook e-module is appropriate and easily understood by learners. The results of the media expert validation of the developed product can be seen in Table 2 below.

Table 2. Results of Media Expert Validation

No.	Aspect	Validator Assessment		Maximum Value	On average	Category
		Lecturer 1	Lecturer 2			
1	Presentation Eligibility	15	15	16	15	highly suitable
2	Graphical Eligibility	34	30	36	32	highly suitable
3	Module Contents	19	18	20	18,5	highly suitable

The results of the media expert validation regarding the presentation suitability aspect yielded an average score of 15 out of a maximum of 16, falling into the 'highly suitable' category. This indicates that, in terms of presentation, the flipbook-based emodule on volleyball is highly suitable for use in teaching volleyball. Furthermore, the results of the media expert validation regarding the suitability of the graphics yielded an average score of 32 out of a maximum of 36; this indicates that, in terms of graphics, the flipbook-based e-module learning material is highly suitable for use in volleyball instruction. Finally, regarding the module content, the media expert validation yielded an average score of 18.5 out of a maximum of 20. This indicates that the flipbook-based module content is highly suitable for use in volleyball instruction and is easily understood by learners.

D. Implementation Stage Teacher Response Test

A feasibility test of the teachers' responses was conducted to ascertain the responses and feedback from subject teachers. Some of the aspects assessed in the teachers' response test included content, language, presentation and graphic design. Table 12 below shows the score conversion for the teachers' response test. The summary of the teachers' response assessment results can be seen in Table 3 below.

Table 3. Results of the Assessment of Teachers' Response Data

No.	Aspect	Validator Assessment			Total	Maximum Value	On average	Category
		Teacher 1	Teacher 2	Teacher 3				
1	Material Aspects	11	12	11	34	12	11,3	Very good
2	Language Aspects	12	12	12	36	12	12	Very good
3	Presentation Suitability	15	16	15	46	16	15,3	Very good
4	Graphic Design Suitability	26	28	28	82	28	27,3	Very good

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The results of the teacher response trial for the developed flipbook-based e-module showed a score of 34 for the content aspect, with an average score of 11.3, falling into the 'very good' or 'highly satisfactory' category. This indicates that the content within the flipbook-based e-module learning material aligns with the core competencies and learning objectives for volleyball, thereby facilitating learners' understanding of the subject matter. The second aspect is language, with a total score of 36 and an average score of 12, falling into the 'very good' or 'highly suitable' category. This indicates that the language used in the volleyball-based flipbook e-module is easily understood by learners, making it suitable for use in teaching. Next, regarding the third aspect—presentation suitability—with a total score of 46 and an average score of 15.3, falling into the 'very good' or 'highly suitable' category, this indicates that, in terms of presentation, the flipbook-based e-module is highly suitable for use or implementation in teaching. Finally, the assessment results for the graphic suitability aspect yielded a total score of 82 and an average score of 27.3. This indicates that, in terms of graphic suitability, the legibility of the font and each image presented can assist learners in understanding the volleyball game material.

Small-scale trial

A small-scale trial was conducted with the aim of assessing the practicality of the flipbook-based e-module on volleyball. The small-scale trial was carried out with 22 Year 8 pupils at SMP Negeri 2 Batauga. The results of the pupils' evaluation of the flipbook-based e-module on volleyball are shown in Table 4 below.

Table 4. Results of the Small-Scale Trial Assessment

No.	Aspect	Total Value	Maximum Value	On average	Category
1	Ease of use	317	16	14,4	Very good
2	Media Gallery	552	27	25	Very good
3	Material Aspects	320	16	14,5	Very good
4	Benefits	245	12	11,1	Very good

The results of the small-scale trial of the developed flipbook-based e-module showed a total score of 317 for the ease-of-use aspect, with an average score of 14.4, falling into the 'very good' or 'very practical' category. This indicates that the flipbookbased e-module is easy to use, thereby facilitating learners' understanding of volleyball material. The results of the assessment for the second aspect, namely media presentation, yielded a total score of 552, with an average score of 25, falling into the 'very good' or 'very practical' category. This indicates that, in terms of media presentation, the material successfully captures learners' interest in studying volleyball. Next, regarding the third aspect—content—with a total score of 320 and an average score of 14.5, falling into the 'very good' or 'very practical' category, this further indicates that the content packaged within the flipbook-based e-module facilitates learners' understanding of volleyball. Finally, the assessment results for the benefit aspect yielded a total score of 245, with an average score of 11.1, falling into the 'very good' or 'very practical' category. This indicates that, in terms of benefits, the flipbook-based e-module learning medium provides learners with the opportunity to study independently whenever and wherever they wish.

Large-scale trial

A large-scale trial was conducted with the aim of assessing the practicality of the flipbook-based e-module learning material on volleyball on a larger scale. The large-scale trial was carried out with pupils from Class VIII.A at SMP Negeri 2 Sampolawa, comprising 22 pupils, and Class VIII.B, comprising 19 pupils. The results of the large-scale trial assessment by students of the flipbook-based e-module on volleyball can be seen in Table 5 below.

Table 5. Results of the Large-Scale Trial Evaluation

No.	Aspect	Total Value	Maximum Value	On average	Category
1	Ease of use	605	16	14,7	Very good
2	Media Gallery	1047	27	25,5	Very good
3	Material Aspects	607	16	14,8	Very good
4	Benefits	464	12	11,3	Very good

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The results of the assessment in the large-scale trial of the developed flipbook-based e-module showed a total score of 605 for the ease-of-use aspect, with an average score of 14.7, falling into the 'very good' or 'very practical' category. This indicates that the flipbook-based e-module is easy to use, thereby facilitating learners' understanding of volleyball material. The results of the assessment for the second aspect, namely media presentation, yielded a total score of 1047, with an average score of 25.5, falling into the 'very good' or 'very practical' category. This indicates that, in terms of media presentation, the material successfully captures learners' interest in studying volleyball. Next, regarding the third aspect—the content aspect—with a total score of 607 and an average score of 14.8, falling into the 'very good' or 'very practical' category, this also indicates that the content packaged within the flipbook-based e-module facilitates learners' understanding of volleyball game material. Finally, the results of the assessment of the benefits aspect yielded a total score of 464, with an average score of 11.3, falling into the 'very good' or 'very practical' category. This indicates that, in terms of benefits, the flipbook-based e-module learning medium provides learners with the opportunity to study independently whenever and wherever they wish.

E. Evaluation Stage

The purpose of this stage was to evaluate the quality of the developed flipbook-based e-module on volleyball. The assessment results indicated that the flipbook-based e-module on volleyball was deemed suitable for use by subject matter experts and highly suitable by media experts. Revisions were then carried out in accordance with the feedback and suggestions from the validators. Following these revisions, the e-module was implemented for use by teachers and students. Based on the assessments by teachers and students of the developed flipbook-based e-module, it was found to be very good/highly suitable and very practical for use.

IV. CONCLUSIONS

The product developed through this research and development project is a flipbook-based e-module learning resource on volleyball for Year 8 students at lower secondary schools. This research and development of the learning resource applied the ADDIE model, comprising the stages of analysis, design, development, implementation and evaluation. The flipbook-based e-module learning resource on volleyball is packaged in the form of a barcode or link, so it can be accessed anytime and anywhere using a smartphone or laptop. The results of the feasibility assessment of the flipbook-based e-module, conducted by subject matter experts and covering three aspects—namely, the learning aspect, the content aspect, and the language aspect—were categorised as "feasible". Furthermore, the assessment results from media experts, comprising three aspects—namely, presentation feasibility, graphic design feasibility, and module content—were categorised as "highly feasible". The e-module learning resource, based on a flipbook format and covering volleyball, was developed to be practical for use following the results of a teacher response assessment. This assessment covered four aspects: content, language, presentation suitability and usability, all of which were rated as 'very good' or 'highly suitable'. Subsequently, in a small-scale trial covering ease of use, media presentation, content and benefits, the results were rated as "very good" or "very practical". Furthermore, in a largescale trial covering ease of use, media presentation, content and benefits, the results were rated as "very good" or "very practical".

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