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Development of Android E-Modules in the Form of Flip Books Based on Balinese Local Wisdom

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Abstract: This study aims to produce an android e-module in the form of a flip book based on Balinese local wisdom on the course of early childhood language development methods that meet the feasibility in terms of content and construct validity as well as practical use in the classroom. This is a research and development (R&D) method with the Borg & Gall model. This study collected data using interview guidelines, questionnaires, and observation sheets. The data analysis technique used is descriptive statistics. The obtained data are then examined to determine the validity and practicability of the produced product. According to the testing findings, the android e-module in the form of a Flip Book based on Balinese local knowledge has fulfilled the feasibility in terms of content validity in the very excellent category with a score of 4.63 out of a possible score of 5.00. Meanwhile, students' ratings in terms of practicality in terms of time usage, which is classed as efficient, are in the good category, totaling 3.76 out of a maximum score of 5.00. The results of this study have implications for the use of e-modules which can be used as an alternative in teaching effective, efficient, and interesting language development methods courses because they are packaged in digital form.

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Introduction

The Covid-19 pandemic has greatly impacted various aspects of life (Aristovnik et al., 2020; Conway et al., 2020; Dwivedi et al., 2020). Education is one of the sectors most affected by the Covid-19 pandemic (Atuahene et al., 2020; Tria, 2020; Tumoka, 2021). Education in Indonesia, which is carried out by the majority with a face-to-face system, directly or offline, after the Covid-19 pandemic, must be done online (Munastiwi & Puryono, 2021; Prasetyo et al., 2022). The policy of implementing online learning targets various levels of education, from basic to higher education (Achmad Syam & Achmad, 2022; Faizah et al., 2021).

Although an online learning policy is in place to control the growth of Covid-19 at multiple educational institutions, the system's implementation has several flaws. Many instructors and students can still not participate in online learning (Baety & Munandar, 2021; Sari et al., 2021; Tafanao & Saputra, 2021). In addition, the availability of teaching materials and the limited knowledge of educators and students in using online learning applications are challenges in implementing this policy (Efriana, 2021; Purandina, 2021; Rafique et al., 2021). This condition is further exacerbated by the unequal access and availability of internet networks in each region.

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Problems with online learning programs exist at both the primary and secondary school levels (Herman et al., 2022; Yan et al., 2021). One of the universities that use online learning is Mpu Kuturan Singaraja State Hindu High School, which has various issues with online learning applications. (Purandina, 2020). Based on observations and interviews with lecturers and students, particularly in the Early Childhood Education Teacher Education Study, online learning problems were discovered, including limitations of digital teaching materials, internet quotas, signals, and online learning applications.

Furthermore, the Early Childhood Education Teacher Education Study's findings from interviews with lecturers who teach early childhood language development methods revealed issues with the availability of digital-based teaching materials that students can access through their smartphones, particularly in implementing online learning. Based on an initial study conducted by distributing questionnaires to students related to learning resources for language development methods, data was found from several questions as follows: First, the learning resources used by students during online learning showed that the majority of students or as many as 85% used modules during online learning. Second, the student's response to the interest in the teaching materials provided by the lecturers shows that the majority of students or 60% quite like the teaching materials provided by the lecturers. Third, data on student expectations for teaching materials provided by lecturers during online learning shows that 40% expect teaching materials that can be accessed by smartphones, 30% expect teaching materials that have an attractive appearance, 20% expect teaching materials that can be accessed online/offline. , and 10% expect teaching materials that can be used independently. Fourth, data on the need for E-Module development shows that the majority of students or 75% stated that it was necessary to develop teaching materials in the form of e-modules to support the learning process.

From the problems above, it is necessary to develop innovative teaching materials by utilizing information technology so that they can be accessed by students and can be read anytime and anywhere (Wiradnyana et al., 2021). The teaching materials developed should also be adapted to students' conditions, identical to the gadgets (smartphones) that students often carry. Thus, lecturers can simplify the learning process and improve student outcomes, especially in online learning (Fanataf, 2020; Misra & Mazelfi, 2021; Pulukuri & Abrams, 2021). One of the teaching materials that can be developed according to the criteria above are modules packaged in digital form or e-modules. The e-module developed in this study will be designed as an Android-based flipbook using Flip PDF Professional software. An Android-based flip book is a digital book in a format like a book that can be flipped back and forth on a virtual display on an Android smartphone (Handayani et al., 2021; Rahmat & Jaya, 2020; Ramyani, 2021). Flipbook media is very appropriate for packaging e-modules because it can make the resulting e-modules more attractive and interactive with a display like a real book, unlike ordinary e-book teaching materials only in pdf format and equipped with text, images, video, and audio (Arifitama, 2018; Fadilah et al., 2021; Kofler et al., 2020). Flipbook media can complement electronic books/modules to accommodate interactive learning activities (Juwati et al., 2021; Mulyadi et al., 2016; Watin & Kustijono, 2017). In addition, the condition of students with smartphones increasingly supports the development of e-modules in the form of flipbooks that can be accessed via Android (Azma et al., 2021; Munzil et al., 2022).

Based on the above, this study will create an android e-module in the form of a flip book based on Balinese local wisdom on language development approaches for early infancy. The android e-module in the form of a flip book produced in this study differs from previous e-modules in that it incorporates Balinese local wisdom into the e-content. Balinese local

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wisdom in this study includes local knowledge, values, skills, and resources that are included in the e-module developed. Module Furthermore, this e-module is meant to be available on Android devices and appears as a genuine book in the form of a virtual book relating to the relevant curriculum.

Research Method

This research uses the Research and Development method. This study's development phases are based on the Borg and Gall model (Gall et al., 2007; Sugiyono, 2017). In more detail, the development procedure in this study can be seen in table 1 below.

Table 1. E-Module Development Procedure

Development Steps	Activities
Research and Information Collecting	Conduct surveys and observations to analyze needs, and identify factors that cause problems so that new product development is needed.
Planning	The plan in this research is to design an Android E-module as a flip book based on local wisdom in the early childhood development method course.
Develop Preliminary Form of Product	Prepare materials, procedures or preparation of e-modules, and evaluation instruments. The research process is carried out by validating product designs by experts in their fields. The validation results are used to improve the product design before being tested.
Preliminary Field Testing	The next stage is a limited trial stage. Data obtained from limited trials were then analyzed and evaluated to improve the product in the next application. Testing at this stage is carried out on 4 (four) students of the Early Childhood Education Teacher Education Study Program Semester II to ensure the E-module is following the demands of the curriculum.
Main Product Revision	Carry out major revisions to the product based on trial suggestions. If there are obstacles in the implementation process, a revision of activities is carried out.
Main Field Testing	Product implementation is developed in the broader area and under more realistic conditions. This activity will be carried out throughout the second semester of the Early Childhood Education Teacher Education Study Program Semester II.
Operational Product Revision	Make revisions to products ready to be operational based on suggestions from trials to fix things that are still unsuitable when the product is applied.

The eighth through tenth stages of the Borg and Gall model were eliminated in this study due to time restrictions. This study's data were gathered using interview protocols, questionnaires, and observation sheets. Using formal interviews, the basic content for the e-module was

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acquired. Questionnaires are used by professionals acting as validators to acquire extensive information on the viability of items. Meanwhile, the product development implementation is determined using the observation sheet.

Furthermore, the data obtained with a specifically designed instrument is reviewed to assess the e-validity Module and practicability. The e-validity Module addresses both content validity and constructs validity. The validator's opinion validation form and a scale of 5 were used to assess the content validity (five). Meanwhile, observations and student reactions to the e-module were utilized to assess its practicability. The data analysis technique used is descriptive statistics.

Results and Discussion

The results of the research presented are following the stages of research that have been carried out, namely: (1) research and information collecting, (2) planning, (3) developing a preliminary form of product, (4) preliminary field testing, (5) main product revision, (6) main field testing, and (7) operational product revision (Gall et al., 2007). A complete explanation of the research procedure can be presented as follows.

1) Research And Information Collecting

The researcher observes and analyses the teaching materials already held or commonly used by teachers of early childhood language development method courses and student handbooks at this level. The following concerns were identified based on observations, interviews with lecturers who teach early childhood language development techniques, and students who have taken courses in early childhood language development methods.

1) The course presenters' teaching materials are solely based on books and publications from publishers. Similarly, online learning demonstrates that the learning resources utilized by lecturers are internet-sourced modules.
2) The modules used by lecturers during online learning are only available in pdf format, which makes them less appealing. Furthermore, the Module in the form of a pdf does not include interactive learning exercises.
3) Students' cell phones might occasionally have trouble accessing courses delivered by professors. To do so, students must install extra software that allows them to open modules in pdf format.
4) The lecturers' learning modules have not assimilated Bali's assets and local Wisdom as a learning feature in higher education.

Researchers are interested in developing an android e-module in the form of a Flip Book based on local Balinese local wisdom on the issue of early children's language development ways to make learning more effective and efficient based on some of the problems described above (Bagus & Astawa, 2022; Kertih & Sriartha, 2022).

2) Planning

At this step, the researcher gathers all information that may be utilized to create goods, in this case, instructional materials that are supposed to solve current problems. In addition, language development learning must also be communicative (Dewi & Purandina, 2022). A course accomplishment (CP) is examined at this point. The following information was chosen to be produced as an android e-module in the form of a Flip Book based on local Balinese wisdom on language development approaches for early infancy.

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Table 2. Mapping of E-Module Materials

Basic Competencies	Achievement Indicators	Subject Matter
Understanding the nature of children's language development	1. Understanding Language and Communication 2. Characteristics and aspects of language 3. Language Function	The nature of children's language development
Understand the theories of language development	1. Nativistic Theory 2. Behavioristic Theory 3. Cognitive Theory 4. Pragmatic Theory 5. Interactionist Theory	Language development theories
Understanding the whole language approach in AUD learning	1. Definition of the whole language 2. Implementation of the whole language in early childhood classes	Whole language approach
Understanding the development of children's listening skills	1. Development of listening 2. Definition, function, and purpose of listening	Children's listening development
Understanding children's speech development	1. The importance of speaking for early childhood 2. Speech development	Children's speech development
Understanding children's writing development	1. The importance of writing for early childhood 2. Writing development	Children's writing development
Understanding children's reading development	1. Definition, role, and purpose of reading 2. Reading development	Children's reading development
Understand how to introduce literature to children	1. The nature of literature 2. Types and classification of literature 3. How to introduce literature to children	Introducing literature to children
Explaining media for early childhood language development	1. Audio media for early childhood language development 2. Visual media for early childhood language development 3. Audio-visual media for early childhood language development	Media for early childhood language development
Explain the method of developing children's spoken language	1. Development of children's listening skills 2. Development of children's speaking skills	Children's spoken language development
Explain the method of developing children's written language	1. Development of early reading skills 2. Development of early writing skills	Children's written language development
Understanding children's language development assessment	1. Early childhood language development 2. Assessment of early childhood language development	Assessment of children's language development

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3) Develop Preliminary Form of Product

At this stage, initial product development is carried out, which includes materials, methods, or module preparation, as well as transforming the Module into a flip book e-module utilizing the Flip PDF Professional program and assessment tools (Belia et al., 2022; Suprapto et al., 2022). The resultant e-module is shown in the image below.

Figure 1. E-Module Front Cover

Figure 2. Flip Book E-Module Creation Process

Figure 3. Adding Videos in E-Modules

The research procedure is carried out by professionals validating product concepts. Before testing, the validation data are utilized to enhance the product design. Experts validate the first draft at a later stage to gain feedback or ideas for refining the text before empirical testing (Liu et al., 2022; Sartono et al., 2022). The results and suggestions for the validation results are shown in the table below.

Table 3. E-Module Suggestions

No.	Suggestion
1	Cover writing on E-module adapted to EYD
2	Consistency of using symbols in E-modules

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3	Writing for activity instructions according to EYD
4	Some grammatical errors need to be checked more carefully

Meanwhile, the following table provides a summary of the outcomes of the expert evaluation.

Table 4. Summary of E-Module Validation Results

No.	Aspect of Validation	Average	Category
1	Contents of E-Module	4,65	Very good
2	How to present E-Modules in general	4,50	Very good
3	The digital form of E-Module in general	4.75	Very good
	Very good	**4.63**	**Very good**

The e-module content validation evaluation findings received an average of 4.63 or were in the very good category. Meanwhile, the minimal feasibility of e-module content evaluation was defined in this study to achieve the good category. Thus, the validation findings show that the e-module is appropriate for classroom learning. The validation stage comments or ideas are utilized as a reference to enhance the e-module draft that has been created (Napoles et al., 2022; Permatasari et al., 2022). A perfect draft will be obtained and empirically tested during this product revision step.

4) Preliminary Field Testing

The next stage is a restricted testing period. Data from limited trials were reviewed and assessed to enhance the product in the following application. The E-Module was tested on four second-semester Early Childhood Education Teacher Education Study students to determine that it met the curriculum's requirements. Because there was no substantial feedback for the e-module draft in the restricted trial, the resultant e-module draft was appropriate for classroom learning (Fagan et al., 2022; Pozzar et al., 2022).

5) Main Product Revision

The following stage is to make substantial changes to the product based on trial feedback. There was no adjustment to the e-module draft based on the trial findings because there were no impediments to the learning process in the classroom. In other words, this e-module prototype has evolved into the final version utilized in classroom instruction (field trials) (Pitnawati et al., 2022; Ulya, 2022).

6) Main Field Testing

Following changes, the next step is to expand testing to a bigger stage, particularly field trials. The designed product is applied in a larger region and under more realistic conditions during this procedure. This activity will be carried out on all second-semester students of the STAHN Mpu Kuturan Singaraja Early Childhood Education Teacher Education Study Program. The purpose of this test is to assess the viability of the produced e-module. A questionnaire will be provided at the end of the learning session to collect this information. Table 5 displays the measurement data (Dunne et al., 2022; Hanida & Rachmadiarti, 2022).

Table 5. Summary of Student Responses to E-Modules

Aspect asked	Rating result	
	Average Score	**Criteria**
1) I enjoy learning by using this E-Module	3.61	Good
2) The appearance of this E-Module is attractive	3.67	Good
3) The contents of this E-Module are interesting to read	3.94	Good
4) I feel challenged to find problems with the material	3.94	Good
5) By reading this E-Module, it helps me to find temporary answers to the problems I find	4.03	Good

Aspect asked	Rating result	
	Average Score	Criteria
6) The presentation of the material in this E-Module is neatly arranged so that it is easy for me to understand	3.56	Good
7) Through this E-Module, it becomes easier for me to understand the material given	3.92	Good
8) Through this E-Module, I get a deep understanding of the material being studied	3.89	Good
9) Through this E-Module, I gain broad knowledge about the material I study	3.42	Good
10) The tasks I have to do in this E-Module are clear	3.86	Good
11) The tasks on this E-Module don't burden me	3.75	Good
12) This E-Module can help me interact with other teachers and students	3.75	Good
13) Through this E-Module, I can solve the problems given both individually and in groups	3.56	Good
14) This E-Module can give me comfort in learning	3.72	Good
15) The characters that I want to train in this E-Module are easy for me to understand	3.92	Good
16) The sentences used in this E-Module are easy to understand	3.83	Good
17) The pictures and tables used in this E-Module are clear	3.81	Good
18) With this E-Module, I become more aware of the benefits of the material that has been studied and what characters need to be trained each time we learn	3.56	Good
19) I always want to practice the character values in this E-Module.	3.69	Good
Average	3.76	Good

According to the table above, the average score received from student replies to the designed e-module is 3.76 out of a possible maximum score of 5.00. According to the predefined practicality requirements, practical (good) E-Modules are employed in learning.

The research findings indicate that the produced E-Module is of high quality in terms of validity and practicability. The next section expands on the validity and applicability of E-Modules in learning.

1) The Validity of the Android E-Module in the Form of A Flip Book based on Balinese Local Wisdom in the Early Childhood Language Development Method Course

Expert content validation and empirical validation are used for e-module validation. The e-content Module's validation evaluation scores indicate an average of 4.63 or are in the very good category. Because of numerous reasons, the outcomes of the e-module development in this study are in the very good category.

a) The constructed e-module adheres to the needs of the KKNI curriculum, namely the provision of scientifically based instructional materials. Furthermore, the themes chosen, the level of the information, and the learning processes provided have all referred to the learning outcomes in the KKNI curriculum.

b) The created e-module is tailored to assessing validity, namely content validity. Content validity and construct validity were discovered in the valid category throughout the construction of this e-module. Substance validity indicates that e-modules were created based on the material's content and theories used as

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references in the formulation or preparation. Meanwhile, construct validity e-modules are those that, during their construction, pay attention to the link between the components of the instructional materials and are organized systematically. Student activities in e-modules allow students to develop their knowledge based on the sub-materials provided, allowing them to become creators and owners of information rather than merely users or memorizers.

c) The E-module components are generated following the validation instrument's indicators. This signifies that the presentation of E-modules in general, in terms of appearance, material substance, and language use, has met and is adhering to the indicators used to assess the quality of educational materials.

Because of the elements mentioned above, the generated e-module meets the legitimate requirements as predicted, both in terms of content and form, making it suitable for learning. Although it has satisfied the legitimate requirements for usage in learning, this E-module has a flaw in that the validation test is conducted with just three lecturers (Fathiya & Asrizal, 2022; Johan et al., 2022). This is the cause for the validators' lack of feedback or ideas.

2) Practicality Level of Android E-Modules in the form of Flip Books based on Balinese Local Wisdom in the Language Development Method Course for Early Childhood

The student's reaction to the ensuing e-module demonstrates the usefulness of the instructional resources. This practicality demonstrates students' ease in using the e-module, which was developed following the predetermined time allocation. The tools, materials, and media used in learning are easy to obtain and use, resulting in students' positive responses to the learning that has been completed (Utami et al., 2022; Yulkifli et al., 2022). Students also responded positively when they eagerly opened the e-home Module's page. Furthermore, the observational data on time consumption and the average score of student replies indicate that the designed e-module falls into the practical category. However, various roadblocks were encountered during the e-module installation phase.

The researcher observed the continuance of learning activities in the classroom when students utilized e-modules during the first meeting. The first meeting of the Module's learning activities is planned for 100 minutes, with three phases of activity: 15 minutes of introduction, 60 minutes of core activities, and 15 minutes of closing activities. The learning activities have mostly followed the predicted learning activities. Students are also regarded to be more self-sufficient in their academic and practical tasks. The children also performed admirably on the evaluation at the end of the chapter.

The following were the difficulties faced at the first meeting of developing the android e-module in the form of a Flip Book based on local Balinese Wisdom on the subject of early childhood language development techniques in the field:

a) Some students are still perplexed about how to utilize and access the menus in the produced e-module.
b) Some students still appear puzzled when taking out exercises on the e-module.
c) It is clear from the discussion activities that some groups could not work together.
d) In group presentation activities, groups that do not offer the discussion outcomes do not wish to reply to the presentation results.

Beginning with the challenges encountered at the first meeting, the researcher and observers addressed the design employed for the second meeting. Based on the debate outcomes, the student handling design is as follows:

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a) Researchers attempt to inspire students by urging them to pay attention to the e-instructions of the Module and activities.
b) Lecturers help students if something is not grasped in group discussion activities by going to each group.
c) Allow other groups that are not on duty as presenters of the discussion outcomes to react.

The second meeting's learning was tailored to the findings of the first meeting's reflection. Based on the outcomes of the second meeting's reflection, various modifications led to a favorable trajectory as compared to the previous meeting, including:

a) Students can use and access the menus on the developed e-module.
b) Students who are not on duty as presenters of the results of the discussion are willing to provide feedback.

The learning activities during the second to fifth meetings followed the expected learning activities. Furthermore, employing time is more efficient and adheres to the time allotment in the e-module. This demonstrates that, following improvements, deploying e-modules at the second to fifth meetings had a good impact. Students can carry out learning activities according to the learning activities' time and activity plans. Furthermore, students and professors appear to be quite familiar with the e-modules being used. Based on this description, it is possible to infer that the android e-module in the form of a Flip Book based on Balinese local wisdom has satisfied the practical criteria of textbooks, making it appropriate for use as a handbook by students. This is virtually identical to the findings of studies undertaken by (Bagus & Astawa, 2022; Kertih & Sriartha, 2022). Their study, however, takes a different course.

Conclusion

Based on the research finding and discussion of analysis, there are some conclusions which are: (1) The Android E-module in the form of a Flip Book based on Balinese local wisdom that was built has fulfilled the feasibility in terms of content validity and is categorized in the very excellent category with a score of 4.63 out of a maximum of 5.00, (2) The android E-module built in the form of a Flip Book based on Balinese local wisdom has fulfilled the feasibility in terms of practicality in terms of time usage, which is categorized as efficient. The student results received are in a good category, with a score of 3.76 out of a possible score of 5.00. The results of this study have implications for the use of e-modules which can be used as an alternative in teaching effective, efficient, and interesting language development methods courses because they are packaged in digital form.

Recommendation

It is recommended that lecturers consistently use e-modules as an alternative to learning, so that learning can take place effectively and efficiently. Students are expected to be more active in using e-modules in learning. It is hoped that other researchers can continue this research to test the effectiveness of the model that has been developed.

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