

## Borneo Wetlands Mobile Application Using Case Method on Wetland Environment Reading Material



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**ABSTRACT:** The importance of the role of wetland environments and the need for more approach so that students have knowledge and are aware of the significance of wetlands that exist around them brings the researchers to develop the Borneo Wetlands Mobile Application. This research employed a Research and Development focusing on Analyze, Design, and Develop phases. The participants on the needs analysis phase are ten lecturers and 95 English Department students from nine universities in South Kalimantan and 65 participants joined the Develop phase as the representative universities. The data was gathered from a questionnaire and a pilot test during the phases. The product was validated by three experts from media, content, and language fields. The results of the analyze phase showed that there is a need to develop reading materials that cover diverse text types from wetland topics due to the fact that not all university students are aware of the wetland existence. The next phase is design phase that resulted design brief. The third and last phase of this study is the application development phase with support from the IT team. The obtained scores from the validators are 80% (Very Good criterion), 82% (Very Good criterion), and 85% (Excellent criterion) respectively. Regarding the pilot test, most of the students responded positively (88.69%) with Excellent criterion. Wetlands can be one of the topics provided to foster a more nuanced awareness of wetlands as students live in South Kalimantan possessing many wetland areas. Students as users are encouraged to apply critical thinking and analytical skills to devise sustainable solutions, promoting a more practical approach. In short, this Borneo Wetlands application is valid and feasible to use for English Department students in South Kalimantan as well as for general users.

**KEYWORDS:** Mobile Application, Case Method, Wetland Environment, Reading Material

### I. INTRODUCTION

Teaching materials related to topics closely related to the student's environment have the potential to make learning more meaningful for them. The delivery of teaching materials with the selection of methods that stimulate student activity will create a more lively classroom (Bel-Ann Ordu 2021). One of the lecture materials with significant potential to be elaborated in a topic close to the life of students living in South Kalimantan is the wetland environment. This is due to the importance of the role of wetland environments as well as the need for more approach so that students have knowledge and are aware of the significance of wetlands that exist around them. In fact, everyone has an equally important role in the sustainability of wetland ecosystems (Aber, Pavri, & Aber, 2012; Kamaludin et al., 2022).

In the field of education, wetland environments can be integrated into learning. One of the wetland-oriented researches is the research carried out by (Aini, Zainuddin, and Mahardika, 2018) on the development of IPA teaching materials using a co-operative learning model oriented to wetland environments. The results of the research conducted by (Amelia and Chandra, 2021) are the development of Indonesian language teaching materials for foreign speakers based on wetland environments. Meanwhile, (Febriyanti and Hidayat, 2023) developed a Picture Storybook with a wetland theme for children. The wetland can be integrated at various levels, especially in the university level, namely to students in South Kalimantan to cultivate common awareness in the sustainability of the wetland environment. This teaching material needs to be developed not only because to adapt to the specifics of the region and also important to be studied considering the area that is around the students are mostly wetland areas (Amelia and Chandra, 2021). Lessons about wetlands are not taught in high school and based on previous research, not all students know the nature of wetlands and have a good understanding of wetland environments. At the university level, reading is a skill to be developed in the learning of English that cannot be separated from other skills because the ability of students on one skill will support the ability to master other skills (Sumaira et al., 2022). Having reading skills is very much needed by someone because with this ability they will be able to improve their English language skills. Thus, reading is an important course and can be used in teaching reading materials about wetland environments.

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One of the good learning characteristics is student-centred learning. Student centered learning is that the lecturer is the facilitator, designer, and motivator, while the students act as an active and participatory learner. One of the methods that facilitates this learning is the case method (Agung and Bramasta, 2018; Syam, 2022). Case method is a teaching learning approach that involves the use of real-life situations or case studies to improve student understanding of a lesson. Through this learning method, students can solve and make decisions on cases found in everyday life. Case methods may be used to improve student activity and collaborative character (Agung and Bramasta, 2018). In case method learning, students can learn actively, apply the theory they have acquired to real life, and find solutions to problems around them. Furthermore, students can develop skills of communication, collaboration, and critical thinking in digging deep into causes and consequences as well as solutions that match the criteria of students of the 21st century (Nurdiansyah, Dianti, and Sujana 2022; Trilling and Fadel, 2009).

Learning materials on wetland environment with case-based methods can be maximized with the help of android in the form of an application that students can download on Playstore/Appstore. Android-based learning media is one of the innovations implemented in the world of education (Ulfa, Sugiyarto, and Ikhsan 2017). The learning features on the android are very diverse and interesting and have different functions. Another advantage, the use of Android-based computing media is flexible because it can be used anytime and anywhere which improves student learning outcomes (Sari et al., 2019). Furthermore, students' learning outcomes have a significant impact on a learning process due to the use of application-based media on android. As a result, Android-based learning has been shown to have a significant impact on teaching activities in the classroom. Further development of Android-based technology is needed to improve the quality of learning.

Previous studies on developing a mobile-based application were done by (Klimova and Zamborova, 2020) in developing reading comprehension and (Sari et al., 2019) on teaching reading comprehension. Their studies showed promising results. However, there is a gap that this research can fulfil, given that the wetlands are around the students and it is important for the students to know the shortcomings, advantages, and consequences that occur in the area. There is scarce mobile-based application focusing on South Kalimantan wetlands. Thus, this research is expected to bring some additional benefits to the study on the development of teaching materials reading in particular on wetland environmental materials at the university level based on case methods assisted by android. This research can provide a reference for teachers in the universities in South Kalimantan and nationally to be able to teach reading with case method on wetlands environmental material that can be accessed through the android application. Students are expected to be able to understand more comprehensively and more interestingly about the situation and existence of the surrounding area. It is hoped that students are expected to be able to actively participate in conscious efforts to preserve and nurture the existence of wetlands. As a result, it is important to carry out research on the development of android-based teaching materials based on the case method for student-level reading materials in the University of Southern Kalimantan. The specific objectives of this research are as follows: (1) Analysis of needs (needs) and wants (wishes) of potential users of Android-aided teaching material based on case methods based on wet land environment on the reading materials of the university level in South Kalimantan; (2) Development of practical and valid android-assisted learning materials on the basis of wet land-based case method on reading materials at the college level in the application. Therefore, the formulation of the problem of the research is How to develop the teaching equipment based on android case based on Wetland-environment based methods on reading material at the higher education level in southern Kalimantan.

## II. METHOD

### Research Design

This research is part of the research and development (R&D) method, following the ADDIE model (Analyze, Design, Development, Implementation, and Evaluation) as proposed by Branch (2010) in order to develop a mobile reading application for university students to improve problem-solving skills. R&D is a research method employed to create products following established procedures and to test the effectiveness of the product. This present research focused on the phases of analyze, design, and develop phases. The whole research flowchart is depicted in Figure 1

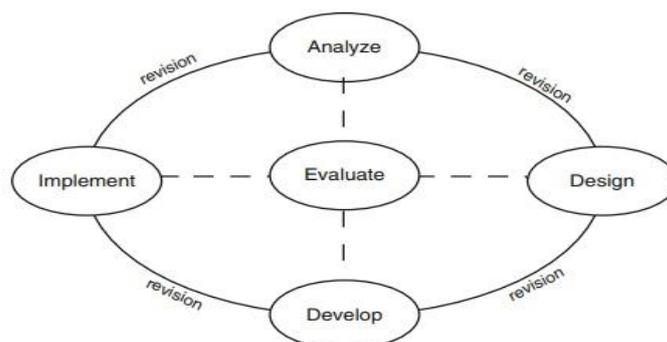


Figure 1. Research Flowchart with ADDIE Model

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Figure 1 shows that the ADDIE model is not solely a direct process, but it can also go back and forth particularly on the revisions. As an early development, the researchers describe the analyze to develop phase in this article. The population in this research consisted of all students in the English Education program in South Kalimantan (9 universities), specifically at Lambung Mangkurat University, UIN Antasari, STKIP PGRI Banjarmasin, STKIP Islam Sabial Muhtadin, UNISKA, Muhammadiyah University Banjarmasin, Nahdatul Ulama University, Sari Mulia University, and STAI Rasyidiyah Khalidiyah Amuntai. The sample for this research included students in the English Education program in South Kalimantan who voluntarily agreed to respond to the needs analysis questionnaire. On the needs analysis phase, ten lecturers and 95 students from nine universities participated. Then, on the Develop phase, 65 participants joined this phase from four representative universities.

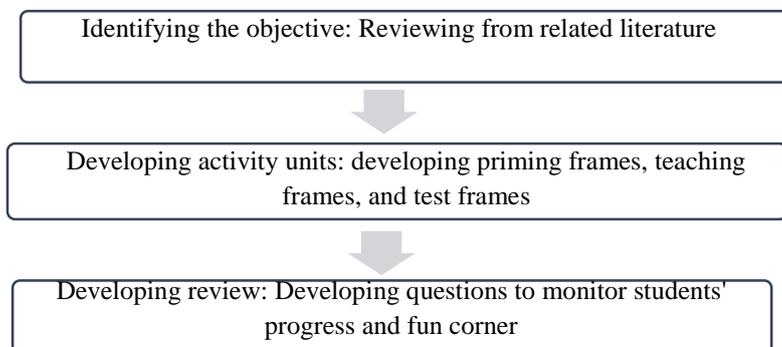
### Research Procedures

#### Analyze Phase

The first phase of this research is the analyze phase. The researchers identified participants' needs, lacks, and wants for Mobile-Assisted Learning Materials Based on the Case Method for Wetland Environment-Based Reading Material at the University level, especially in South Kalimantan. Analysis of materials, user needs, learning media, and problems were part of the analysis. In this first phase of needs analysis, data was collected and analyzed by identifying the English lesson plans in the Reading course. During this phase, the researchers determined the intended audience and identified required resources through a need-analysis questionnaire. The questionnaire comprises 20 questions on the reading skills in the current classes (Items 1 - 3), reading materials and apps (Items 4 - 7; Items 16 - 20), wetland concern and case method (Items 8 - 15). It was distributed on April - May 2023. The data was then analyzed descriptively.

#### Design Phase

The design phase is the second phase of the ADDIE model. In this phase, learning objectives were designed and testing strategies were generated based on the findings from the needs analysis phase. This research required the involvement of application developers to choose the right technology, prepare the appropriate architecture, utilize the latest tools and trends, and maintain the quality of the developed product. The technology used is Machine Learning in the form of an application facilitated by the team at <https://birran.com/>. The application development team and researchers discussed the information and content to be included and how the application interface would be designed. UI/UX design and programming code creation are part of this phase. In the design phase, the researchers also used the instructional material development model that was incorporated into the application, following the phases outlined in the Innotech SEAMEO (1974) model, consisting of three main phases as seen in Diagram 2.



**Diagram 2. Instructional Material Development Model from Innotech SEAMEO (1974)**

#### Develop Phase

The third phase is to develop Android-Assisted Learning Materials. The development phase proceeded with the identification of needs, lacks, and wants as well as design brief results. This phase involved generating content, develop the application, and develop guidance for the students and lecturers. It included specifying and selecting application development methods and the supporting application to be used in the system's development. In this phase, content input into the media was carried out. In this phase, the researchers also conducted a formative revision and a pilot test with a questionnaire (17 questions) given to the participants.

#### Data Collection Techniques

Data for this research was collected through the distribution of a questionnaire and documentation during the analyze phase. The questionnaire used consisted of multiple-choice questions with a Likert scale containing four categories. Additionally, data was also collected in the implementation phase through pre-test and post-test using the developed application. The instruments used in this phase include pre-test, post-test, three validation sheets in the product validation phase, trial questionnaires, and questionnaires in the pre-test and post-test. Detailed descriptions of each instrument can be found in Table 1.

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**Table 1: Description of Each Instrument**

No	Research phase	Data Analysis	Respondents	Instrument	Description
1.	Analyze phase	Quantitative analysis	Lecturers & students	Questionnaire, documentation	This instrument helped gather data to produce product specifications that were used as a foundation for developing the product.
2.	Develop phase	Qualitative analysis	Validator 1	Validation assessment Sheet	The assessment sheets were used to validate the products in terms of the content, language, and design and to describe the product's validity from the general overview, introduction, instructional material, and conclusion.
			Validator 2	Validation assessment Sheet	
			Validator 3	Validation assessment Sheet	
			Students	Questionnaire, pre-test and post-test try out	The pilot test was done to examine the instruments readiness before going to the next phase

### Data Analysis Techniques

The data analysis technique used to analyze qualitative data in the analysis phase involved percentages. Quantitative data such as percentage and frequency can be used to demonstrate the developed product (Bilgin, 2021). Regarding product feasibility, a product would be considered feasible if it is valid, practical, and effective. This study focuses on validity and practicality. Three expert validators validated the content in the content preparation phase, media validation in the media development phase, and language validation in this Android-based application. Analysis of expert validation results and student responses was carried out using the Likert scale percentage formula by Sugiyono (2015) as follows.

$$Percentage = \frac{Score\ obtained}{Maximum\ score} \times 100\%$$

Then, the assessment of the product was consulted to the feasibility criteria from not suitable to very worthy criteria as seen in Table 2.

**Table 2: Feasibility Criteria**

Range of Score	Description
85%-100%	Excellent (no need for revision)
75%-84%	Very Good (needs revision)
65%-74%	Good (needs revision)
55%-64%	Poor (needs revision)
0%-54%	Not suitable (needs revision)

Adapted from (Jumadi et al., 2023)

Practicality of the instructional materials was also measured based on students or user responses on the pilot test. Student responses to the use of Android-Assisted Learning Materials were then classified. The application would be considered practical when user responses reach an average achievement of at least Good criterion.

### III. RESULTS

The researchers confirmed the intended participants, in the needs analysis phase, through participants analysis. The data obtained in this phase is that the participants are active students of nine English Departments in South Kalimantan, Indonesia. These departments are varied from private and public universities. There were 10 lecturers and 95 student participants responded to the questionnaire in details for students: 34.7% from Universitas Muhammad Arsyad Al-Banjary, 31.6% from Universitas Lambung Mangkurat, 16.8% from UIN Antasari Banjarmasin, 7.4% Universitas Nahdatul Utama, 4.2% from STAI Rasyidiyah Khalidiyah, 3.2% from STKIP Islam Sabilal Muhtadin, 2.1% Universitas Muhammadiyah Banjarmasin. These students are from the second, fourth, sixth, and seventh semesters. The students are taking Reading Course during their undergraduate study on different semesters depending on the curriculum of the study programs.

#### Analyze Phase

Then, the researchers identified required resources through a need-analysis questionnaire to obtain the participants' needs, wants, and lacks. The needs analysis in this current study covered three foci (necessities, lacks, and wants) by (Hutchinson and Waters, 1987). The product was arranged based on students' characteristics through the three foci. At the same time, there are three sub-dimensions covered in this study: current reading course, reading materials and apps, as well as wetland concerns and case method. Table 3 shows the results of the first sub-dimension (current reading course).

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**Table 3: Current Reading Course**

Current Reading Course	Responses (%)	
	Students	Lecturers
Reading skill is taught separately as a course in your study program.	82.1%	100%
Reading courses given in a form of series.	81.1%	9%
When does the students take Reading Course(s)?	1 <sup>st</sup> – 5 <sup>th</sup> semester	1 <sup>st</sup> – 5 <sup>th</sup> semester

The second sub-dimension is reading materials and applications. The results are depicted in Table 4.

**Table 4: Reading Materials and Applications**

Reading Materials and Applications	Responses (%)	
	Students	Lecturers
Availability of printed reading materials.	53.7%	70%
The needs of android-based/ iOS reading materials.	87.4%	50%
Necessity reading material necessary.	94.7%	100%
Expectation of a reading material form.	Printed 5.3%	Digital based 20%
	Digital based 10.5%	Both printed and digital
	Both printed and digital 84.2%	80%
The most appropriate text type to integrate the wetland topics.	General knowledge 7.4%	General knowledge 10%
	Related to reading course 25.3%	Related to reading course 30%
	Various texts 67.4%	Various texts 60%
The needs of tables, graphs, and/or illustrations in the texts.	92,6%	100%
	7,4%	0%
The most appropriate vocabulary focus to integrate the wetland topics.	General terms 9.5%	General terms 10%
	Academic terms 16.8%	Academic terms 20%
	Related to wetlands 73.7%	Related to wetlands 70%
The most appropriate vocabulary delivery to integrate the wetland topics.	Compulsory in reading 81%	Compulsory in reading 90%
	Not compulsory in reading 19%	Not compulsory in reading 10%
The most appropriate grammar materials to integrate the wetland topics.	Included in reading 66.3%	Included in reading 30%
	Not included in reading 33.7%	Not included in reading 70%

The third sub-dimension results are given in Table 5.

**Table 5: Wetland Concerns & Case Method**

Wetland Concerns & Case Method	Responses (%)			
	Students		Lecturers	
Wetland materials in reading course provided in your study program.	Yes 16.8%		Yes 10%	
	No 25.3%		No 60%	
	I don't know 57.9%		I don't know 30%	
Experience of studying wetland materials in any courses including reading.	36.8%	63.2%	20%	80%
Wetland materials that can be integrated into reading courses.	80%	20%	100%	0%
It is important to get/ deliver wetland material to students.	86.3%	13.7%	70%	30%
It is to get/ deliver wetland material to students.	Very important 14%		Very important 10%	
	Important 73%		Important 60%	
	Less important 12%		Less important 30%	
	Not important 1%		Not important 0%	
Students can be given reading materials on wetland in a case method.	69.5%	30.5%	90%	10%
Students discuss things related to wetlands.	78%	22%	60%	40%
Students follow every procedure in a discussion or other tasks provided in the class.	95%	5%	100%	0%

According to the findings of this needs analysis, there is a need to develop reading materials that cover diverse text types from wetland topics due to the fact that not all university students are aware of the wetland existence around them. Considering the existing content resource that is printed, through the given choices in the questionnaire, both lecturers and students chose mobile-based application with various text types on wetland environment concerns including vocabulary and grammar.

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### **Design Phase**

The next phase is design phase that resulted design brief. This phase aims to verify the desired performance task and appropriate testing methods. The researchers used the findings from the needs analysis phase. The instructional material development model that was incorporated into the application by following the phases outlined in the Innotech SEAMEO (1974) model. The researchers identified the learning objectives by reviewing from related literature and using the course semester plan, developed activity units: developing priming frames, teaching frames, and test frames and developed the review by developing questions to monitor students' progress before and after the use of the application. Four units to nurture students' problem solving and critical thinking skills with the learning objectives were achieved: (1) Wetlands in South Kalimantan, (2) Why are Wetlands important? (3) What Lives in South Kalimantan Wetlands, and (4) Maximizing Wetlands in South Kalimantan. It was designed that the Menu structure (1) Login, (2) Home with four options namely (a) Read Materials in which all four units contain learning objectives, unit-related videos, reading texts followed by problems that students must solve, multiple-choice exercises, and quizzes through Quizziz, (b) Overview, (c) Progress report to assess the extent of each student's progress as an application user, and (d) About page.

The team of <https://birran.com/> and the researchers discussed the information, content, and interface design. The Borneo Wetlands application is an Android application that runs on the Android operating system. The Introduction contains general information as part of the introduction, covering the purpose of creating the document. General Description contains a general description of the application and the application guide document. The Required Devices are the lists the software and hardware needed. Meanwhile, Menu and Usage contains the user manual or guide for using the Wetlands application.

### **Develop the Product**

The third and last phase of this study is the application development phase with support from the team at <https://birran.com/>. The application development phase began in May starting from generating the content. Then, an intensive development phase from July to August. Borneo Wetlands is an application designed for students in Indonesia, specifically for South Kalimantan, to provide them with information about wetland areas. The application offers various learning materials about wetlands in their vicinity. For students in South Kalimantan, the features of this application include objectives, videos, materials, quizzes, and a progress tracker for easy monitoring of the learning process. In developing the products, the required devices are hardware that is Android Smartphone and Software in the form of Android Operating System. The Application Users must understand the interface and usage of Android smartphones and have an understanding of the application usage flow.

When the application is first opened, the login page will appear. Users can log in using the Google account already on their Android device. Then, the home page contains a list of reading materials, and each displayed card can be clicked to enter the material page. If users click on "Read," users will enter the reading page. This page consists of several tabs: Objective, Videos, Reading, and Exercise. Users can swipe left and right to switch between tabs. The Objective Tab contains the objectives or goals of the material. The Videos Tab includes videos related to the material that the users can play them by clicking the "Watch" button. The next is Reading Tab containing reading materials that can be read by the user. There are "+" and "-" buttons to enlarge and reduce the text. Exercise Tab contains quizzes to be completed. Users can answer the quiz by selecting the correct option. At the top, there is a score indicating the number of correct answers and the question number. Users can choose an answer by pressing one of the options. Once the quiz is completed, a pop-up will appear showing the results in numerical form. Click "OK" to repeat the quiz; users last score will be saved. Then, the Overview Page provides an overview of the material to be studied. The display of the Overview page is as follows. The progress page will display users' learning progress and the scores from the quizzes for each material while the about page contains the purpose and description of the application. The guidance for both lecturers and students was developed for the ease of use. The application, named Wetlands Read, was then handed over to three expert validators (in the fields of IT, language, and English teaching for wetlands content) as part of formative revision. The obtained scores from the validators are 80% (Very Good criterion), 82% (Very Good criterion), and 85% (Excellent criterion) respectively. The revisions from the validators were done in terms of the application name from Wetlands Read to Borneo Wetlands, the additional page of material overview, objectives, the link of the quizziz placement, and the number of questions on the exercise. The results of the revisions are given in Pictures 1 - 4.

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Figure 1. The developed application before revision



Figure 2. Table of content display



Figure 3. The developed application after revision



Figure 4. Material overview display

Subsequently, the next phase involved a pilot test of the Borneo Wetlands application at four out of nine universities with English Education programs, selected voluntarily. These are Universitas Lambung Mangkurat, STAI Rakha Amuntai, UIN Antasari Banjarmasin and Universitas Nahdatul Ulama Kalsel. The selection of these universities was based on their availability or the presence of classes in the first and second weeks of September 2023. Other universities could not be chosen because their classes had not started. The students who participated in the pilot test represented the same group of the students for which this application is designed. The facilitator who led the pilot test was the lecturer of the university under the observation of the researchers. A questionnaire was given to the participants to examine their responses after using Borneo Wetlands application. The result of this phase is the Borneo Wetlands application. This application, during the pilot test, has been registered on Google Play, but was still in the registration process. Therefore, the students must download the application directly without going through the Google Play Store. The following are documentation of the pilot test of this study.



Figure 5. Pilot test at Univ. Lambung Mangkurat



Figure 6. Pilot test at STAI Rakha Amuntai



Figure 7. Pilot test at UIN Antasari with students from UIN Antasari and Universitas Nahdatul Ulama Kalsel

Table 6: The Average Results of Students' Responses on the Pilot Test (64 Students)

Questionnaire Response Score	Percentage	Description
980/1105	88.69%	Excellent

The results derived from questionnaire given to 65 students from four English Departments in four universities in South Kalimantan showed that most of the students responded positively (88.69%). As much as 11.31% of the students gave surprising responses such as they do not want to actively participate in sustainable living to protect maintain the existence of wetlands (12 students) and after receiving knowledge about wetlands, there are still three students who do not want to protect wetlands in South Kalimantan. This result might be because of their lack of understanding of what wetlands are and why we need wetlands. However, overall responses conveyed by the students as participants of this study are in Excellent criterion in which most of them think that it is possible to return the damage of peat functions in South Kalimantan wetlands and other wetland areas and are willing to help return the damage of peat functions in South Kalimantan wetlands and other wetland areas. Regarding the advantage and feasible use of the Borneo Wetlands Application, the participants stated that the use of wetland reading mobile application educate them about wetlands as it provides them an interesting way to learn the condition and existence of the area around them. Some constructive suggestions given by the students, among others, are Student A: *“I think this application is very good. However, It would be better if the video was more high definition. The choice of the backsound must be more suitable for the video such as sounds that show more nature because a video with good quality and the right background sound that matches the video will make it more interesting.”* Student B: *“Minimize the size of the software, Maximize the using of display, and simplyphise the language.”* Student C: *“I don't think there is because this application is good enough and the material is quite easy to understand. However, so that this application can be even better, if it can be repaired or upgraded again because not everyone can download or access this application. Perhaps that apps can used by all device, like IOS.”*

**IV. DISCUSSION**

The development of this Borneo Wetlands application aims to integrate reading skill into an Android mobile application focused on wetland topics offers several advantages. First, reading as one of the main courses given in English Departments is a language skill that must be possessed by students. Through reading, students not only require comprehension skills, but also improve their vocabulary and acquire knowledge about the topics (Ahmed, 2016; Jose and Raja, 2011; Sumaira et al., 2022). Reading allows

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students to gain in-depth information, explanations, and details about any topics provided (Masduqi and Subiyanto 2021). Wetlands can be one of the topics provided to foster a more nuanced awareness of wetlands as students live in South Kalimantan possessing many wetland areas. Students as users of the Borneo Wetlands app can delve into detailed relevant cases, real life, expert insights, and their own ideas when they face cases given in the Borneo Wetlands application as a holistic skill development.

As a holistic skill development, the Borneo Wetlands application considers the technology resources namely mobile phone. This is due to the condition that every student possesses a mobile-phone. The use of technology aims to support innovation in educational systems and to improve teaching and learning quality including teaching reading (Cardona, Rodríguez, and Ishmael, 2023; Mulyadi and Aimah, 2021; Sari et al., 2019; Sumaira et al., 2022). Students can easily learn anywhere and anytime through mobile-phones. Thus, this is a good opportunity to teachers for maximizing this condition. In addition, mobile phone as the form of mobile technology provides learning styles that are more highly tailored to the requirements of the individual students (Ahmad 2020; Ataş and Çelik, 2019). The Borneo Wetlands application also provides tools for students to track their progress and assess their skills over time. Analytics offer valuable insights into individual strengths and areas for improvement, allowing for personalized learning journeys. The last one is human resource consideration. The number and level of expertise of the lecturers in all English Department in South Kalimantan would bring to the ADDIE process of this study. The representative lecturers were helpful during all the phases. The first and foremost, the findings of the analyze phase are analysis summary to aid the researchers in progressing to the next phases of development that is design phase.

The lesson plan of almost all study programs' curricula structured the reading course as series given in the first to the upper semester. This places the emphasis on the importance of reading. In the context of English as a foreign language, teaching reading is included in the reading comprehension aiming to improve students' skills (Anaktototy and Lesnussa, 2022; Cahyono and Widiati 2006; Masduqi and Subiyanto, 2021). However, the course of English for Wetlands is merely provided in Universitas Lambung Mangkurat. There is still an opportunity of introducing wetlands to students from other universities in South Kalimantan to provide bigger impact. Students not only gain knowledge about but also cultivate essential problem-solving skills applicable in real life through the offered reading skill (Jose and Raja 2011; Xu, Wang, and Wang 2023). Thus, the developed mobile-application goes beyond traditional learning methods, offering a holistic approach to skill development.

Previous studies conducted by (Dekhane, Xu, and Tsoi, 2013) proved that mobile app development can increase problem-solving skills in general education. More precisely, (Malkawi, Alhadrami, and Aljabri, 2019) showed results in higher education physics. that the interactive mobile application is able to enhance students' problem-solving skills, and (Verawati et al., 2022) study was conducted in math field to improve problem-solving skills of ratio through the development of android learning media. Meanwhile, this present study not only focuses in English field but also fosters environmental awareness particularly on wetlands concern. Thus, problem-solving skills are also applicable across various disciplines. In order to simulate real-world problem-solving, the Borneo Wetlands application presents students with scenarios inspired by actual conservation challenges in South Borneo. Students as users are encouraged to apply critical thinking and analytical skills to devise sustainable solutions, promoting a more practical approach to problem-solving. (Iriani et al., 2019) emphasized that prospective teachers are expected to possess environmental care knowledge as educators who will educate students. In this case, all English Department prospective teachers can instill a sense of responsibility and encourages their students to consider sustainable solutions to environmental challenges in South Kalimantan locally and in the world globally. Finally, this Borneo Wetlands application promote students' reading skills and equips students with the problem-solving skills needed to face future challenges, making them adaptable and resilient now and later.

## CONCLUSIONS

The Borneo Wetlands Mobile Reading Application aims to provide holistic skill development and environmental awareness as an innovative and effective tool for skill development. This application is declared valid and feasible for students in South Kalimantan as well as general users as seen from the score given from three validators and students in four universities in South Kalimantan. By emerging technology, environmental education, and case method in reading material for university level, this application promises to shape a generation of students particularly in South Kalimantan capable of addressing the intricate challenges. As students embark on the journey of learning, they not only enrich their academic experience during the undergraduate study but also contribute to the broader goal of creating conscientious global citizens that are aware of their surrounding environment.

## ACKNOWLEDGMENT

The authors thank Rector of Universitas Lambung Mangkurat and Head of LPPM Universitas Lambung Mangkurat for the funding and support from the research process until the publication. In addition, gratitude is given to all participants (lecturers and students) of English Department in South Kalimantan for their active participation.

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