Design and Validity of Local-Wisdom-Based Reading Apps Using Adobe Animate CC 2022

Cahyo Hasanudin[1,*], Ayu Fitrianingsih[2], Nofia Fitriyana[1], and Nabila Ulfaida[1]

[1]Indonesian Language and Literature Education Department, IKIP PGRI Bojonegoro, Pacul, Indonesia
[2]English Education Department, IKIP PGRI Bojonegoro, Pacul, Indonesia
Email: cahyo.hasanudin@ikippgribojonegoro.ac.id (C.H.); ayu_fitrianingsih@ikippgribojonegoro.ac.id (A.F.); 21110078@ikippgribojonegoro.ac.id (N.F.); 21110076@ikippgribojonegoro.ac.id (N.U.)
[*]Corresponding author
Manuscript received May 31, 2023; revised June 29, 2023; accepted July 24, 2023; published January 2, 2024

***Abstract*—Reading activity can be carried out by utilizing various media such as textbooks, digital books, and applications. This study aims to investigate how are the design and validity of local-wisdom-based reading application which is developed using Adobe Animate CC 2022 apps. This study is a stage in developmental research. Research samples are 270 students. The data in designing and validating the application is collected using observation, interview, and questionnaire techniques. It is analyzed using content analysis which is validated using Aiken's V index. Results of this study in designing and validating a reading app are started from the first step of finding problems. There are three main problems in teaching early reading. The second step is to compile and distribute questionnaire. The questionnaire consists of five questions to investigate students' needs. The third step is to develop the design and prototype of local-wisdom-based early reading apps which implements Adobe Animate CC 2022 Apps. The fourth step is to conduct evaluation. It involves two material experts of early reading and two learning media experts. Validators' suggestions have been used to improve the developed application. The conclusion of this study is that the materials of early reading application implement Indonesian local wisdoms which have not implemented in other reading applications.**

***Keywords*—Adobe Animate CC 2022, local wisdom, reading application**

I. Introduction

Reading is one of basic competences in learning language which is combined with writing skill, listening skill, and speaking skill [1]. Reading activities can be stated to be typical learning activities for students in the classroom [2]. Reading is stated as ability with main understanding of two elements, namely understanding language and understanding meaning or decoding [3] which is assessed based on word accuracy and its capture rate [4]. Therefore, reading belongs to one of language competences in teaching and learning activities by understanding language or decoding.

Reading is able to increase people's creative and critical thinking skills, writing skill, and language use [5]. It can also improve their insight and knowledge [6]. Moreover, reading drives people to be more intelligent and have more experiences which are able to increase their academic achievement [7]. A study by Muhyidin *et al.* [8] reveals that early reading can be started by introducing syllables, words, and sentences.

The advantages of reading can be viewed after it is carried out; it is able to train someone in controlling ideas and having discussion well. Reading book is able to prevent the brain tissue damage and able to build someone's character, develop his self-potential, and produce many ideas [9]. Reading does not only improve intellectual intelligence, it is also able to improve emotional and spiritual intelligences [10].

Even though reading plays important role in human's life, there are several students who have low reading ability. Differences in individual reading ability make reading development in each group or class tends to be inconsistent [11]. Furthermore, students in second grade of primary school tend to have low reading comprehension [12].

The evidences of inconsistent reading growth and its obstacles can be viewed from the results of previous researches. Children who have low reading ability having difficulties to read words, sentences, and short stories; so they need strategies to facilitate them to have better reading ability such as parents who read books to them every day [13]. Local wisdom-based-books can be utilized to teach early reading skill. However, there are less of local-wisdom-based teaching materials [14].

The problem of declining reading skill can be overcome with several solutions such as presenting interesting learning media. Media for teaching reading are varied; it can utilize traditional textbooks or electronic books [15]. Other simple media which can be implemented to improve reading skill is games that can be associated with letters, words, or stories [16].

Apart from those learning media, there are many digital games which are more practical and able to access easily that can be solution to improve reading skill. One of digital games is GraphoLearn; it supports each level in learning reading [17]. There is a media which combines learning design with Screencast-O-Matic apps [18] and various digital media for reading that are greatly influenced by technology [19].

Rapid technological advance has provided opportunity for educational field to utilize technology in teaching and learning process [20] which is more interesting and efficient for students [21]. Various types of technology can be used to optimize the teaching and learning program to be more effective [22], so it saves time and creates more efficient learning [23]. Therefore, technology is important to be implemented in creating effective teaching and learning process.

One of technological advances that can be implemented in teaching is Adobe Animate CC 2022 because it can create animated graphics for animation project. Moreover, it can be added by texts, audio, videos, and action script which can be accessed using Android, iOS, Desktop Windows, and Mac OS. It enables the user to import audio and video from Adobe

Audition and Adobe Premiere. It is designed to create dynamic and interactive websites which can be easily accessed. Adobe Animate CC is a multimedia authoring and computer animation program developed by Future Splash Animator, Adobe Flash Professional, Macromedia Flash, and Adobe Systems [24]. The development of Adobe Animate CC is conducted to create professional tool that can be used in making bit mat and animation, so the user can design interactive and dynamic sites [25]. Adobe Animate CC can be stated as extraordinary software which can be used to make dynamic content for all media platforms [26] such as video game projects, television, online videos, websites, internet applications, and web applications in form of graphic design [27] and animations [28].

Adobe Animate CC provides many advantages to help its user. One of the advantages of Adobe Animate CC can be viewed in educational field in which it helps teachers in delivering concrete material easily and attractively [29]. Another benefit is that the results of interactive media from this program can be utilized on cellphones [30], so the multimedia interactivity process with users is very good [31].

Adobe Animate CC can be used in facilitating user's work. Its advantages can be viewed from the project development that is able to combine graphics, animations, videos, and audio before being published to various platforms [32]. It is equipped with controllers, so users can operate themselves in designing animations, animated advertisements, web games, and learning media [33]. Moreover, this software is able to be run easily on computer and laptop in Indonesia because it has installed Adobe Flash Player [34]. In addition, Adobe Animate CC is faster to be used and more compatible with all types of smartphones [35].

In the previous studies, the users of Adobe Animate CC have proven that this software can be implemented easily and helps them. A study conducted by Putri *et al*. [36] is a research which utilizes the advantage of Adobe Animate CC in learning process. In that study, interactive media which has been designed using Adobe Animate CC to implement cognitive conflict-based learning obtains very good evaluation results and valid expert reviews. Moreover, Audhiha *et al*. [37] have achieved satisfactory results for interactive media based on Adobe Animate CC. In that research, it is successful in creating interactive media on geometric materials which are stated to be valid and practical by experts. Its validity is 93,1% whether its practicality is 86,96%. The satisfactory results of using Adobe Animate CC drive the researchers to adopt it in designing local-wisdom-based reading application.

Reading application is intended as a tool that allows users to learn reading skill more quickly because it makes them enjoy the learning process [38]. Reading app that uses innovative development can show its success rather than traditional class [39]. Furthermore, reading app provides positive effect [40]. It is very useful for children who have difficulties in developing their reading skill [41]. In other words, reading app facilitates teaching and learning process to be more productive for children with low reading skill.

In the 21st century, application in facilitating reading process to be more effective and efficient is various types and forms. One of reading apps with fun and unique appearance is Bamboomedia BMGames Apps which makes students to be excited in reading activities [42]. In addition, several types of dictionaries are also used to learn reading such as Fastdic, LDOCE5, Google Translate, Oxford Dictionary, Dict Box Persian, Merriam-Webster English Dictionary, Tahlilgaran, Dict Plus, Persian Dic, PICO Dic [43] and applications with complete components in developing grammar, vocabulary, and reading skill such as Hello English [44].

Reading applications have been studied in previous researches. A research which has implemented an application to improve reading skill is conducted by Al-Jarf [45]. That research discusses about Mobile Fiction Apps (MFA) as reading instruction aid which reveals that application can improve students' reading understanding. However, it is also stated that MFA does not always guarantee the success of reading development. So, future researchers have to more utilize latest technology. Therefore, this study utilizes Adobe Animate CC in designing reading app, so the success rate of using application can be guaranteed.

A research conducted by Nawaila *et al*. [46] discussed about the use of application in learning reading. It explains that DLMA_NEU is a digital literacy mobile app with lots of videos and images for children with low reading skill. Limitation of that research is that the test cannot be optimal and there is no explanation related to application design and content of material that is lack of details. Therefore, this study focuses on the design and validity of reading application.

Reading application is designed using Adobe Animate CC which contains materials about local wisdom elements. Local wisdom is a basis in developing reading application because it has advantages that are in line with goals of Indonesian schools; it becomes an important point that can be built into learning material [47]. Furthermore, Laila *et al*. [48] reveal that local-wisdom-based learning is more effective in maximizing students' reading skill.

Amaliyah *et al*. [49] state that literacy culture which involves local wisdom will be more efficient to enrich students' knowledge and improve their enthusiasm in learning reading. Another study is concluded that the use of local wisdom in increasing students' reading skill obtains good responses from material experts, linguists, and teachers [50].

In Indonesia, local wisdom is varied because there are many customs and tribes with various characteristics. It has existed since prehistoric times when indigenous Indonesian tribes began to develop their life using their knowledge and experiences to adjust to natural environments. It is an expression of Indonesian local tribes [51] in forms of cultural heritage and knowledge taught to their descendants [52–54].

The development of Indonesian local wisdom is influenced by geographical factors, the diversity of ethnics and religions, and interactions with foreign cultures which came to Indonesia. Therefore, Indonesian local wisdom can be found in forms of norms, ethics, beliefs, customs, and several special rules [55], musical instruments, songs, and dances [56], *Uma* traditional house, belief in *bilou* sounds [57], culture, traditional communication tools, creative community products [58], oral folklore [59], etc.

Local wisdom plays important role for Indonesian society. It is intended as an expression of Indonesian ethnic groups such as Borobudur temple and Prambanan temple which have

been built with beautiful carvings and batik motifs that go international [60]. Moreover, there is also local wisdom in the form of amazing views and depictions of indigenous tribes, such as the *Khayangan Api* and *Samin* tribes in Bojonegoro Regency [61].

Another food that becomes a well-known icon for Indonesian local wisdom is *tumpeng*; it is traditional food made from rice and served with vegetables, eggs, and chicken meat for traditional ceremony [62]. Furthermore, local wisdom in form of oral literature which is presented through poetry in traditional ceremony at Lampung province is called *Pepaccur* [63].

The Indonesian local wisdoms can be utilized as materials in the reading app. Those local wisdoms consist of tribes, cultures, traditions, arts, traditional weapons, historical places in Indonesia from Sabang to Merauke. Those local wisdoms are included in the reading app in form of reading syllables, words, sentences, and narrative text materials.

The materials of reading syllables utilize syllables which contain local wisdom elements, e.g. V patterned syllable is *A-la-meng*. Example of VK (*Vokal Konsonan*/Vowel Consonant) patterned syllable is *Em-bung*. Examples of KV (*Konsonan Vokal*/Consonant Vowel) patterned syllables are *Wa-yang, Su-bak, Be-bie.*

Those Indonesian local wisdoms can be used as materials of reading skill. It is in form of reading words or sentences. Reading word materials implement the words which contain local wisdom elements, such *as "Kentrung", "Keroncong", "Ledre", "Ludruk", "Megengan", "Reog", "Tayub"*, and *"Sandur"*. Reading sentence materials implement the sentences which contain local wisdom elements, such as *"Puput melihat Kereta Kencana Singa Barong."* [Puput saw Singa Barong Golden Train], *"Didi sedang mengunjungi Pura Mangkunegaran di Solo."* [Didi was visiting Mangkunegaran Temple in Solo], and *"Budi mengikuti upacara Popokan saat Budi merayakan panen."* [Budi joined Popokan ceremony in harvest time].

Those local wisdoms are also able to be used as reading materials of simple stories. The materials can utilize stories which contain local wisdom elements, for example "Ella visited Lombok Island during semester break. She studied the life of Sasak people there. Sasak people had traditional musics called *Gendang Beleg*. It was performed by a dozen personnels. They entertained guests on important days". Other example of story is "On Sunday, Lita visited her grandma's house. She lived in Central Kalimantan. There, her grandma served her favorite foods. It was *mangenta*. During harvest time or wedding party, Dayak people at Central Kalimantan made *mangenta*. It was made as an offering for *tatu parei*".

Those local wisdoms in reading materials have not been studied in previous research, so it becomes a novelty in this study. Another novelty can be viewed from the reading application which is the output of this study. Therefore, local-wisdom-based reading application which is designed using Adobe Animate CC 2022 needs to know its design and validity.

II. Methodology

A. Research Design

This study is developmental research. It implements the developmental stage by Akker *et al*. [64]. It can be viewed in Fig. 1.

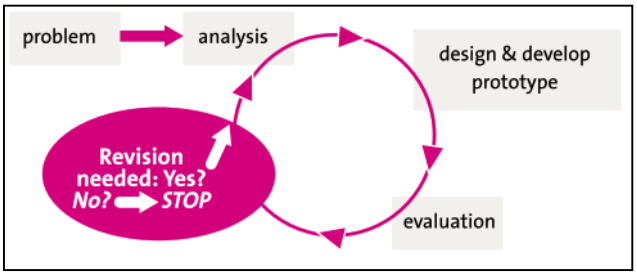


Fig. 1. Iterations of systematic design cycles.

This study is started from a problem of early reading in five regencies of East Java, Indonesia. The problems are investigated using questionnaire of need analysis for students. When the students' needs are obtained, the researchers create the design and prototype of application. Finally, the design is evaluated by validators.

B. Sample and Data Collection

Samples of this study are 270 students. They are consisted of 77 students of Bojonegoro Regency, 51 students of Tuban Regency, 55 students of Lamongan Regency, 48 students of Jombang Regency, and 39 students of Mojokerto Regency. They come from public and private primary schools. The samples are the first grade of primary schools. They are chosen using purposive random sampling technique because their reading skills have to be improved to answer the results of need analysis. Schools with disabled students are not selected because they can be samples for further research. In evaluation stage, it includes two material experts of early reading in primary school and two experts of learning media. The sample distribution can be viewed in Table 1.

Table 1. Samples distribution

No	District	School	Gender	
			M	F
1	Bojonegoro	JMK 3	2	6
		ALFAT	7	9
		GLGH 1	6	9
		GGR	2	6
		MIM 22	11	19
2	Tuban	PRMBN 2	5	9
		SGH 1	5	12
		ALFLH	8	12
3	Lamongan	KDLR	2	4
		ARRA	6	16
		JGRG 2	4	11
4	Jombang	45 KLN	4	8
		BWNG 2	5	15
		KPNJN 2	11	17
5	Mojokerto	PDNKR 2	6	16
		SDU ALK	1	3
		MIAFDIN	5	8

Data is collected using observation sheets and interview

guidelines. The need analysis uses closed questionnaire with answers of strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. This questionnaire consists of four questions which can be viewed in Table 2.

Table 2. Questions of students' need questionnaire

Number of Question	Question
1	What do you think when early reading material contains local wisdom values?
2	What do you think when reading application can be installed at smartphone?
3	What do you think when materials of reading application consist of a) understanding alphabets, b) reading consonant and vowels, c) reading syllables, d) reading words, e) reading sentences, f) reading narrative and informational texts?
4	What do you think when materials of reading application contain images, sounds, and animations?
5	What do you think when the display of reading application is set into portrait (standing) form?

Evaluation stage is conducted to evaluate the design of local-wisdom-based reading apps. In this case, questionnaire is utilized to assess the aspects of reading apps based on the experts of material and learning media. There are two questionnaires in this stage. The first questionnaire is provided to material experts of early reading. The second questionnaire is provided to the experts of learning media. The answer of each question in it utilizes Likert scale and there is a space to give comments. This space is used to give suggestions and comments on the design of reading application. When both experts have fulfilled the questionnaires, Front Group Discussion is carried out to justify the revision results made by the researchers based on experts' suggestions and comments.

Moreover, data from experts of material and learning media in evaluation stage is validated using the formula of Aiken's V. It is explained by Miles and Huberman [65] as follow:

$$V = \frac{\sum s}{n\,(c-1)} \tag{1}$$

where

V = index of respondents' agreements regarding item validity.

s = score set by respondent minus the lowest score ($s = r-1$)

r = score of choice category on respondent

n = number of respondents

c = number of choice category filled by respondents

After obtaining scores from each expert, these scores are converted to investigate the design validity of reading application using Table 3.

Table 3. Criteria of expert test validity [64]

No	Average Score	Validity Level
1	$0.8 < V \leq 1.0$	Very valid
2	$0.4 < V \leq 0.8$	Quite valid
3	$0 < V \leq 0.4$	Less valid

C. Data Analysis

In this study, data analysis is utilized to analyze the qualitative data obtained from the stages of finding problems and need analysis. It implements content analysis method which is developed by Retnawati [66] starting from 1) data reduction, 2) data presentation, and 3) verification or drawing conclusion. In data reduction stage, the researchers reduce similar data from samples' responses. In data presentation stage, the researchers categorize data based on samples' responses. In conclusion stage, the researchers make conclusion about students' need. Therefore, the content analysis method is conducted to compile the product of local-wisdom-based reading apps.

III. Results

In discovering design and validity of local-wisdom-based reading application, four stages were implemented, namely 1) finding problems, 2) conducting need analysis, 3) creating design and developing prototype of local wisdom based reading app, 4) conducting evaluation.

A. Finding Problems

This study was conducted because there were problems of early reading at primary schools. First, students had difficulties in reading words, sentences, and short stories. Second, they were not familiar with the local wisdoms around them. Third, there was no innovative learning media in teaching early reading.

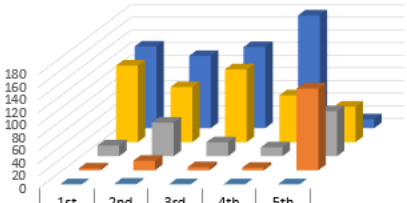
B. Conducting Need Analysis

Those problems were explored more deeply by providing questionnaires to students at five regencies in East Java, Indonesia. The results of it showed that there were 129 students who were strongly agree when early reading contained local wisdom elements. There were 121 students who were agree about it, 17 students were neither agree nor disagree, and 3 students were disagree. There was no student who chose strongly disagree about it. Moreover, the results of questionnaire showed that there were 114 students who were strongly agree when reading application could be used on smartphones. There were 87 students who were agree about it, 53 students were neither agree nor disagree, and 15 students were disagree. There was no student who chose strongly disagree about it.

Furthermore, there were 128 students who were strongly agree when the material in reading application contained about a) understanding alphabets, b) reading consonant and vowel sounds, c) reading syllables, d) reading words, e) reading sentences, f) reading informational and narrative texts. There were 22 students who were neither agree nor disagree about it, 5 students were disagree. There was no student who chose strongly disagree about it. In addition, there were 178 students who were strongly agreed when materials in reading application were presented using images, sounds, and animations. There were 74 students who were agree, 14 students were neither agree nor disagree, and 4 students were disagree. There was no student who chose strongly disagree about it.

The last result showed that 14 students were strongly agree when the display of application was set into portrait form. There were 56 students who were agree about it, 71 students were neither agree nor disagree, and 129 students were disagree. There was no student who chose strongly disagree.

Those results of need analysis could be viewed in Fig. 2.



	1st question	2nd question	3rd question	4th question	5th question
strongly disagree	0	1	0	0	0
disagree	3	15	5	4	129
neither agree nor disagree	17	53	22	14	71
agree	121	87	115	74	56
strongly agree	129	114	128	178	14

Fig. 2. Questionnaire results of students need analysis.

C. Creating Design and Developing Prototype of Local-Wisdom-Based-Reading Application

When the students' needs were analyzed, the design and prototype of reading application were arranged and developed. The application was designed to have local-wisdom-based learning materials. It consisted of a) understanding alphabets, b) reading consonant and vowel sounds, c) reading syllables, d) reading words, e) reading sentences, f) reading narrative and informational texts. The materials were presented in images, sounds, and animations. This application could be used in smartphones using landscape form. Design of local wisdom-based reading application was described as follows.

The homepage design of local-wisdom-based reading application depicted mountainous area and girls who were practicing *Thengul* dance. This dance was local wisdom of Bojonegoro Regency, Indonesia. It is chosen to be a design in the homepage of local-wisdom-based reading application because it has several characteristics among other dances, namely 1) it tells about traditional activities such as planting rice and harvesting time which are related to natural environment; 2) the movements of *Thengul* dance tend to be soft, twisty, and flowing which have elegant hand movements; 3) its movements and stories describe the values of togetherness, mutual corporation, gratitude, and harmony with nature; 4) *Thengul* dance performance is accompanied by Javanese traditional music such as *gamelan* and *keroncong* music. Those characteristics make it to be a part of Bojonegoro cultural heritage which enrich Indonesian cultural diversity. It becomes the reason to make *Thengul* dance to be a visual image in the homepage of Local-wisdom-based reading application. It enables users to understand and learn local wisdom values of *Thengul* dance. It also facilitates students in learning to read and understanding Indonesian local culture.

There were also two boys who wore red and white uniform, hats, and tie. The uniform was the characteristics of primary school students in Indonesia. In the upper right corner of homepage, there was an icon of reading application. It was "Si Raca". It could move down automatically when the homepage was opened. At the bottom of homepage, there were three navigation buttons, namely sign in button, exit button, and information button. The application design could be viewed in Fig. 3.

Fig. 3. Homepage design of local wisdom-based reading application. [Translation: Si Raca Reading Application. *Masuk* (Sign in). *keluar* (Exit).]

The design of main menu in this local-wisdom-based reading application implemented *Kayangan Api* background. *Kayangan Api* was local wisdom in Bojonegoro Regency, Indonesia. It is 'a source of eternal fire'. It is a geological phenomenon in which the natural gas comes out through the ground (fractures). Near the point of gas eruption, there is a spring which produces a pungent odor because of sulfur. A long time ago, it was the hermitage of a master from Majapahit Era named Empu Supa. He did meditation and created heirloom there. The heirloom was called *Keris Jangkung Luk Telu Blong Pok Gonjo* that was created and burnt using the fire coming out of the ground. Then, Empu Supa was appointed as Empu Majapahit with the title of Empu Kriya Kusuma.

The reasons on the use of *Kayangan Api* background in the design of local-wisdom-based reading app are 1) as a form of visual representation for local culture which provides authentic experience for users, 2) as effective educational tool which introduce local wisdom and Bojonegoro traditions to users, so they can appreciate this unique culture, 3) to increase users' satisfaction and make them to be more interested on this reading app, 4) to create different application. It builds a good perspective on local wisdom. Therefore, the users are interested to have authentic experience in reading.

The main menu had animation of blazing fire, a gate that could open and close automatically, and moving clouds. The cloud images contained the menus of materials, exercises, and games. The material menu had six menus, namely alphabets, consonant and vowel sounds, syllables, words, sentences, and narrative texts. The design could be viewed in Fig. 4.

Fig. 4. Main menu design of local wisdom-based reading application. [Translation: *Alfabet* (Alphabets), *Vokal* (Vowels), *Konsonan* (Consonants), *Suku Kata* (Syllables), *Kata* (Words), *Kalimat* (Sentences), *Latihan* (Exercises), *Teks Narasi* (Narrative Texts), *Permainan* (Games)]

Design of word menu in this reading application contained 19 examples of word. Those words were local wisdom elements in Indonesia, such as Tayub. *Tayub* is traditional

dance performance in Central Java, East Java, and Yogyakarta. It refers to a dance which is performed by a group of female dancers called *waranggono* or *wilis*. It is accompanied by *gamelan* and Javanese songs. It has strong social and cultural values for Javanese people. It is performed in traditional events, such as wedding party,circumcisions, and cultural festivals. Moreover, it is a media to preserve Javanese traditions and customs.

The reasons on the use of *Tayub* in the reading material of local-wisdom-based reading app are 1) as an educational tool which enriches users' knowledge and understanding of art performance in Indonesia, 2) to attract users' intention because it creates a different characteristic in reading app, 3) to support the performance of local tradition because the users are able to appreciate traditional culture, 4) to promote local art performance, so the users understand the existing cultural richness, and 5) to create a phoneme arrangement of t-a-y-u-b which is easy to be spelled by students. This word can be visualized using a figure/picture. The word menu design can be viewed in Fig. 5.

Fig. 5. Word menu design of local wisdom-based reading application. [Translation: *Tayub* is a traditional dance in East Java, Indonesia]

Those designs were created using Adobe Animate CC 2022. Stages in developing local wisdom-based reading application were as follow. First, Adobe Animate CC 2022 had to be downloaded and installed. Second, it had to be opened by clicking an icon as viewed in Fig. 6.

Fig. 6. Icon of Adobe Animate CC 2022.

Third, user chose 'file' menu and clicked 'new' to create a new concept. The 'new' menu had many categories. User could choose 'game' and click 'create' button. The prototype of main menu in this reading application was created using Adobe Animate CC 2022 which could be viewed in Fig. 7.

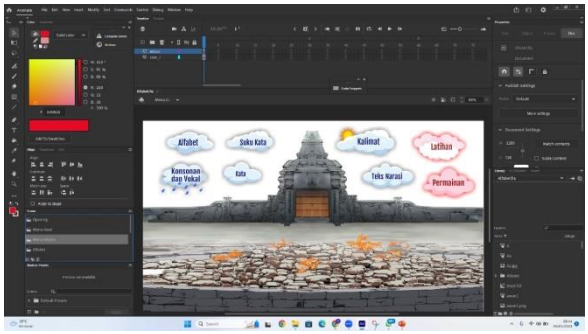


Fig. 7. Prototype of main menu in Adobe Animate CC 2022.

D. Conducting Evaluation

When the design and prototype of local-wisdom-based reading application had been developed using Adobe Animate CC 2022, this application was validated by two validators of material experts and two validators of learning media experts. Those validators evaluated it based on instrument items that had been compiled.

The material experts had assessed the local-wisdom-based reading application. The first validator provided a score of 0.956. It was included in the average score $0.8 < V \leq 1.0$ with validity level of very valid. The second validator provided a score of 0.897. It was included in the average score $0.8 < V \leq 1.0$ with validity level of very valid. He gave suggestions such as 1) it needed to reduce several sentences in the story of 'narrative text' menu; 2) it needed revision for the mount's color which was black in the 'sentence' menu. The assessment of both validators could be viewed in Table 4.

Table 4. Assessment of material experts

No.	Validators of Material Experts	Score given	Validity Level
1	1st material expert	0.956	Very Valid
2	2nd material expert	0.897	Very Valid

Learning media experts had assessed the local-wisdom-based reading application. The first validator provided a score of 0.863. It was included in the average score $0.8 < V \leq 1.0$ with validity level of very valid. He suggested adding navigation about the writer in the 'information' menu. The second validator provided a score of 0.966. It was included in the average score $0.8 < V \leq 1.0$ with validity level of very valid. He suggested adding 'exit' button in main menu. The assessment of both validators could be viewed in Table 5.

Table 5. Assessment of learning media experts

No.	Validators of Learning Media Experts	Score given	Validity Level
1	1st learning media expert	0.863	Very Valid
2	2nd learning media expert	0.966	Very Valid

Based on suggestions from the experts of learning media and material, the appearance of local-wisdom-based reading application had to be revised. Its revision could be viewed in Fig. 8.

Before revised

After revised

Fig. 8. Revision of mount's color in material of reading sentences.

IV. Discussion

Reading has an important role in education for primary school students. Based on a study conducted by [8], early reading can be started by introducing syllables, words, and sentences. However, it has not been explained the detail examples about the use of syllables, words, and sentences. In this study, the design and validity of local-wisdom-based reading app create the materials of reading syllables, words, sentences, and narrative texts. Those materials are based on Indonesian local wisdom.

Local wisdom in these reading materials becomes novelty of this study. It includes different materials to understand and develop reading comprehension. In this case, local wisdom refers to knowledge, experiences, and practices in Indonesian society from Sabang to Merauke, e.g. names of tribes, cultures, traditions, arts, traditional weapons, and historical places.

Every Indonesian community has unique characteristics which can be associated with reading skill. The implementation of local wisdom in reading materials means utilizing it to develop students' understanding and reading skill. By implementing local wisdom, this study has new perspective in teaching and learning reading skill. The reading materials in this study enable students to learn their own cultures and develop more understanding of it. Moreover, the implementation of local wisdom is able to improve students' intention and motivation because they are able to study its values and find its correlation with their cultures.

Local wisdom in reading makes it to be valuable resource in improving reading skill. When it is integrated in teaching to read, it provides different contexts which are relevant for students. The integration of local wisdom and learning to read provides more opportunity to respect the cultural heritage and increases the relevance of learning materials.

Local wisdom values which are included in teaching and learning process will facilitate students in obtaining knowledge and information. Local wisdom as learning material is able to stimulate students in developing their characters [67] because it is very appropriate for early childhood [68]. Education which includes local wisdom will create better students' ways of thinking [69].

Moreover, local wisdom becomes the most efficient way to improve students' reading skill. It can be utilized as learning material to increase students' reading skill faster [70]. It is due to the emergence of local wisdom which is able to be one of the success factors for students' reading skill by involving surrounding environments [71]. The implementation of local wisdom into reading materials is very important to add students' knowledge in early reading skill [72].

Local wisdom and early reading skill are indirectly related in basic education because it has to be introduced to students' in elementary schools [73]. However, local wisdom is rarely utilized in reading activities; so it makes students' intention to read to be low [74]. Local wisdom cannot be separated from language activities including reading [75], so it can be utilized to create more interesting learning to read [76]. In other words, the involvement of local wisdom in early reading activity needs to be given more attention because it can improve students' early reading skill.Without considering local wisdom, teaching and learning process will get obstacles and children's education will be chaotic [77]. It is because the role of local wisdom is very important for early children; it provides sharing value and important educational values [78]. Moreover, Local wisdom contains values that form the basis for education because it can build character [79] and religious value for children [80]. In other words, local wisdom plays an important role for children growth to create their characters and instill educational values, so teaching and learning process can be carried out successfully.

Furthermore, the teaching and learning process which can utilize local wisdom is reading, especially education for early children. Local wisdom can make students to get closer to life and have fun in learning to read [81]. Based on the results of limited and field trials conducted by Khasanah *et al*. [82], local wisdom is proven to play important role in improving students' early reading skills.

In reading process, local wisdom drives to improve children's intention and interest to read [83]. It gives effective impact on students' reading skill [84]. It can be reading material for children and parents [85]. Therefore, it is important for parents and schools to present local wisdom values in children's reading activities, so learning process will be more meaningful, fun, and effective.

To obtain maximum learning result, innovative media is needed to adjust local wisdom values with developmental era and learn to read. It can be conducted by utilizing technology advance [86]. The implementation of technology in learning to read based on local wisdom can provide advantage that is educational and interesting for children [87].

Learning for early children is required to be more innovative and creative, especially in learning to read [88]. It is supposed to make students to more explore and take benefit of reading process [89]. One of innovations which can be implemented in presenting local wisdom into learning process is an application that integrates local wisdom values as basic of learning materials [90]. Based on those ideas, learning with local wisdom requires innovation which can make students understand the reading process by using technology in form of application.

Currently, there are many reading applications which have been tested in previous researches. A research conducted by Nawaila *et al*. [46] reveals that DLMA_NEU is digital literacy application for Androids which is intended for children aged 7–18 years. However, that research has not shown materials to develop reading skill and its impact on students' reading skill. Moreover, Al-Jarf [45] has conducted a research about Mobile Fiction Apps (MFA) as a media in increasing reading skill. In that research, it is stated that application is able to improve reading skill. However, it has not explained the fictional material used. In addition, both researches do not mention the use of local wisdom as basic materials for teaching reading. Therefore, this study presents a reading application which utilizes local wisdom. It has not been ever conducted by previous researchers.

The design of reading app and local wisdom materials are the novelty of this study. There are many reading apps which have been developed and installed using Play Store, such as learning to read with Marbel app which has been developed by Educa Studio, learning to read app which has been developed by *Taman Edukasi*, let's learn to read app which

has been developed *Annisa Cipta Informatika*. Those applications have taught users to read syllables, words, and sentences. However, it has not implemented local wisdom elements.

Local wisdom elements are integrated into this reading app which has been designed and validated. It is able to drive students to have better reading comprehension. Furthermore, this reading app can be more interesting and motivate students. The novelty of this study can be viewed in Fig. 9.

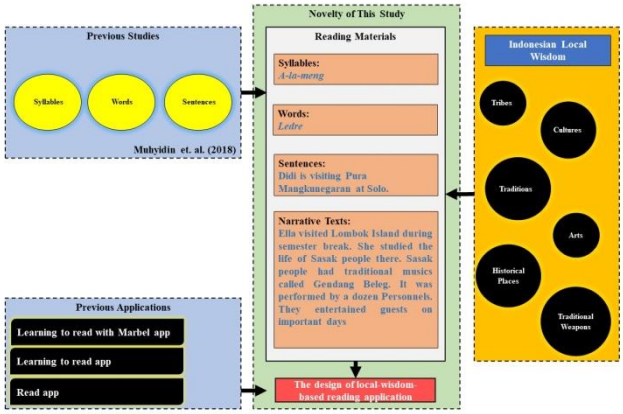


Fig. 9. Novelty of this study.

V. Conclusion

This study concludes that in developing local-wisdom-based reading application can utilize four stages, which are consisted of finding problems, analyzing it, designing and developing prototype of application, and evaluating it. Those stages have not been implemented by previous researchers in creating local-wisdom-based reading application. Adobe Animate CC 2022 has been used to design interactive media for ICT and spatial teaching materials. In this study, it is utilized to design local-wisdom-based application for early reading. Findings of this study provide information about students' needs in early reading at primary school level. Teachers and other researchers can implement these four stages in developing similar application for other three language skills, such as listening skill, speaking skill, writing skill, or different materials needed by students.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

CH Making concepts and preparing the research background; AF evaluate results translating the manuscript; NF evaluate designing the pictures and the application concepts; NU evaluate reference sources and editing; all authors had approved the final version.

Funding

This study was funded by Dirjen Diktiristek in a grant of Decentralized Research Program.

Acknowledgment

The researchers would like to thank the *Direktorat Riset, Teknologi, dan Pengabdian kepada Masyarakat (DRTPM), Direktorat Jenderal Pendidikan Tinggi, Riset, dan Teknologi* (Dirjen Diktiristek) who have fully funded for this study through the Decentralized Research Program in higher education at 2023 with a scheme of *Penelitian Dasar Unggulan Perguruan Tinggi (PDUPT)*.

References

[1] H. K. Widyaningrum and C. Hasanudin, "Kajian kesulitan belajar Membaca Menulis Permulaan (MMP) di sekolah dasar, [A study on students' early reading and writing difficulties in primary schools]," *Pedagogia: Jurnal Pendidikan* [Educational Journal], vol. 8, no. 2, pp. 189–199, 2019, doi: https://doi.org/10.21070/pedagogia.v8i2.2219.

[2] R. I. S. Marcos, V. L. Fernández, M. T. D. González, and J. Phillips-Silver, "Promoting children's creative thinking through reading and writing in a cooperative learning classroom," *Thinking Skills and Creativity*, vol. 36, 2020, doi: https://doi.org/10.1016/j.tsc.2020.100663.

[3] H. N. Hjetland, A. Lervåg, S. A. H. Lyster, B. E. Hagtvet, C. Hulme, and M. Melby-Lervåg, "Pathways to reading comprehension: A longitudinal study from 4 to 9 years of age," *Journal of Educational Psychology*, vol. 111, no. 5, 2019, doi: https://doi.org/10.1037/edu0000321.

[4] R. Abbott, T. Mickail, T. Richards, K. A. Renninger, S. Beera, and V. Berninger, "Understanding interest and self-efficacy in the reading and writing of students with persisting specific learning disabilities during middle childhood and early adolescence," *International Journal of Educational Methodology*, vol. 3, no. 1, pp. 41–64, 2017, doi: https://doi.org/10.12973/ijem.3.1.41.

[5] N. Bastin, *Literacy, Speaking, and Listening Skills*, Nahason Bastin Publishing, 2022.

[6] R. Ulwia and N. Nurelysa, *Indonesian Reading*, Jawa Barat: Quepedia, 2019.

[7] A. Widyastuti, *Tips for Telling Children to Like Reading and Writing*, Jakarta: Elex Media Komputindo, 2017.

[8] A. Muhyidin, O. Rosidin, and E. Salpariansi, "Metode pembelajaran membaca dan menulis permulaan di kelas awal [Learning method of early reading and writing in the first grade]," *JPsd (Jurnal Pendidikan Sekolah Dasar)*, vol. 4, no. 1, pp. 30–42, 2018, http://dx.doi.org/10.30870/jpsd.v4i1.2464.

[9] I.R. Purwantara, *The Art of Reading Books*, Yogyakarta: Penerbit Andi, 2022.

[10] I. Musbikin, *Penguatan karakter gemar membaca, integritas, dan rasa ingin tahu [Enhancing Characters of Reading Habit, Integrity, and Curiosity]*, Yogyakarta: Nusamedia, 2021.

[11] C. W. Little, C. J. Lonigan, and B. M. Phillips, "Differential patterns of growth in reading and math skills during elementary school," *Journal of Educational Psychology*, vol. 113, no. 3, 2021, https://psycnet.apa.org/doi/10.1037/edu0000635.

[12] J. Pulkkinen *et al*., "Cognitive skills, self-beliefs and task interest in children with low reading and/or arithmetic fluency," *Learning and Individual Differences*, vol. 97, 102160, 2022, https://doi.org/10.1016/j.lindif.2022.102160.

[13] X. Bao, H. Qu, R. Zhang, and T. P. Hogan, "Modeling reading ability gain in kindergarten children during COVID-19 school closures" *International Journal of Environmental Research and Public Health*, vol. 17, no. 17, 2020, doi: https://doi.org/10.3390/ijerph17176371.

[14] A. E. Putri, "Analisis Kebutuhan Bahan Ajar Berbasis Literasi Digital Nilai-Nilai Kearifan Lokal pada Tradisi Saprahan di Pontianak [Need analysis of digital literacy-based materials about local wisdom values in Saprahan tradition at Pontianak]," *Yupa: Historical Studies Journal*, vol. 3, no. 1, pp. 1–7, 2020, https://doi.org/10.30872/yupa.v3i1.132.

[15] A. J. Rockinson-Szapkiw, J. Courduff, K. Carter, and D. Bennett, "Electronic versus traditional print textbooks: A comparison study on the influence of university students' learning," *Computers & Education*, vol. 63, pp. 259–266, 2013, doi: https://doi.org/10.1016/j.compedu.2012.11.022.

[16] C. S. Huntsinger, P. E. Jose, and Z. Luo, "Parental facilitation of early mathematics and reading skills and knowledge through encouragement of home-based activities," *Early Childhood Research Quarterly*, vol. 37, pp. 1–15, 2016, doi: https://doi.org/10.1016/j.ecresq.2016.02.005.

[17] M. Niemelä, T. Kärkkäinen, S. Äyrämö, M. Ronimus, U. Richardson, and H. Lyytinen, "Game learning analytics for understanding reading skills in transparent writing system," *British Journal of Educational Technology*, vol. 51, no. 6, pp. 2376–2390, 2020, doi: https://doi.org/10.1111/bjet.12916.

[18] C. Hasanudin and A. Fitrianingsih, "Flipped classroom using screencast-o-matic apps in teaching reading skill in Indonesian language," *International Journal of Pedagogy and Teacher Education*,

vol. 2, pp. 16–151, 2018, doi: https://doi.org/10.20961/ijpte.v2i0.25356.

[19] H. Støle, A. Mangen, and K. Schwippert, "Assessing children's reading comprehension on paper and screen: A mode-effect study," *Computers & Education*, vol. 151, 2020, doi: https://doi.org/10.1016/j.compedu.2020.103861.

[20] R. Shadiev and M. Yang, "Review of studies on technology-enhanced language learning and teaching," *Sustainability*, vol. 12, no. 2, 2020, doi: https://doi.org/10.3390/su12020524.

[21] I. Zulaeha, C. Hasanudin, and R. Pristiwati, "Developing teaching materials of academic writing using mobile learning," *Ingénierie des Systèmes d'Information*, vol. 28, no. 2, pp. 409–418, 2023, doi: https://doi.org/10.18280/isi.280216.

[22] H. Keser and A. Semerci, "Technology trends, education 4.0 and beyondbeyond," *Contemporary Educational Researches Journal*, vol. 9, no. 3, pp. 39–49, 2019, doi: http://dx.doi.org/10.18844/cerj.v9i3.4269.

[23] A. Szymkowiak, B. Melović, M. Dabić, K. Jeganathan, and G. S. Kundi, "Information technology and gen Z: The role of teachers, the internet, and technology in the education of young people," *Technology in Society*, vol. 65, 2021, doi: https://doi.org/10.1016/j.techsoc.2021.101565.

[24] R. A. Perdana, "Rancang bangun aplikasi panduan menghadapi bencana alam berbasis android menggunakan Adobe Animate CC [Android-based application design to face natural disaster using Adobe Animate CC]," *Jurnal Pengembangan Rekayasa dan Teknologi [Journal of Engineering and Technology Development]*, vol. 17, no. 1, pp. 11–15, 2021, doi: http://dx.doi.org/10.26623/jprt.v17i1.3634.

[25] S. Samsudin, M. D. Irawan, and A. H. Harahap, "Mobile app education gangguan pencernaan manusia berbasis multimedia menggunakan Adobe Animate CC [Mobile app education of multimedia-based human digestive disorders using Adobe Animate CC]," *(JurTI) Jurnal Teknologi Informasi [Journal of Information Technology]*, vol. 3, no. 2, pp.141–148, 2019, doi: https://doi.org/10.36294/jurti.v3i2.1009.

[26] V. Serevina, I. Astra, and I. J. Sari, "Development of e-module based on problem based learning (PBL) on heat and temperature to improve student's science process skill," *Turkish Online Journal of Educational Technology-TOJET*, vol. 17, no. 3, pp. 26–36, 2018, url: https://eric.ed.gov/?id=EJ1184205.

[27] M. Dhanil and F. Mufit, "Design and validity of interactive multimedia based on cognitive conflict on static fluid using Adobe Animate CC 2019," *Jurnal Penelitian & Pengembangan Pendidikan Fisika [Journal of Physics Education Research & Development]*, vol. 7, no. 2, pp. 177–190, 2021 doi: https://doi.org/10.21009/1.07210.

[28] F. V. Sianturi and M. Damanik, "The development of learning media "adobe animate" in hydrocarbon material," *COMSERVA: Jurnal Penelitian dan Pengabdian Masyarakat [Journal of Research and* Community Service], vol. 1, no. 11, pp. 983–993, 2022, doi: https://doi.org/10.59141/comserva.v1i11.148.

[29] F. F. Nabilah, B. Hendrawan, and M. F. Nugraha, "Pengembangan media animasi PTG berbantuan Adobe Animate CC materi satuan panjang kelas IV SDN 2 Cintaraja [Developing PTG animated media using Adobe Animate CC in the material of length unit]," *JPGSD: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar [Journal of Primary School Teaching]*, vol. 13, no. 2, pp. 93–100, 2020, doi: https://doi.org/10.33369/pgsd.13.2.93-100.

[30] P. L. Atmam and F. Mufit, "Using Adobe Animated CC in designing interactive multimedia based on cognitive conflict on parabolic motion materials," *JIPF (Jurnal Ilmu Pendidikan Fisika) [Journal of Physics Education]*, vol. 8, no. 1, pp. 64–74, 2023, doi:https://dx.doi.org/10.26737/jipf.v8i1.3597.

[31] S. F. Anggraini and F. Mufit, "The validity of interactive multimedia based on cognitive conflict on elasticity materials using Adobe Animate CC 2019," *EDUCATUM Journal of Social Sciences*, vol. 8, no. 1, pp. 13–22, 2022, doi: https://doi.org/10.37134/ejoss.vol8.1.2.2022.

[32] S. Aini and F. Mufit, "Using Adobe Animate CC Software in designing interactive multimedia based on cognitive conflict in straight motion," *Jurnal Penelitian Pendidikan IPA*, vol. 8, no. 5, pp. 2350–2361, 2022, doi: https://doi.org/10.29303/jppipa.v8i5.2048.

[33] A. Sanusi and F. Y. A. Haq, "Pembelajaran bahasa Arab melalui penggunaan media Adobe Animate CC di sekolah [Arabic language learning using Adobe Animate CC at school]," *Al-Ma 'rifah*, vol. 18, no. 1, pp. 1–14, 2021, https://doi.org/10.21009/almakrifah.18.01.01.

[34] S. Sudarman and A. Ardian, "The development of interactive module to support student centered learning," *Akademika: Jurnal Teknologi Pendidikan [Journal of Educational Technology]*, vol. 10, no. 1, pp. 77–92, 2021, doi: https://doi.org/10.34005/akademika.v10i01.1344.

[35] I. Prasetyo, A. Rofieq, S. Sukarsono, and T. I. Permana, "How kidneys work? Developing of Android-based Adobe animate media for senior high school students," *Research and Development in Education*, vol. 2, no. 1, pp. 19–32, 2022, doi: https://doi.org/10.22219/raden.v2i1.20378.

[36] N. S. Putri, F. Mufit, A. Putra, and H. Hidayati, "Design and validity of interactive multimedia based on cognitive conflict in kinetic gas theory materials using adobe animate cc," *Gravity: Jurnal Ilmiah Penelitian dan Pembelajaran Fisika [Journal of Physics Research and Learning]*, vol. 9, no. 1, 2023, doi: http://dx.doi.org/10.30870/gravity.v9i1.12690.

[37] M. Audhiha, A. Febliza, Z. Afdal, Z. A. Mz, and R. Risnawati, "Pengembangan multimedia interaktif berbasis adobe animate cc pada materi bangun ruang sekolah dasar/madrasah ibtidaiyah [Development of interactive multimedia based on adobe animate cc on the geometry material for primary school] ," *Jurnal Basicedu*, vol. 6, no. 1, pp. 1086–1097, 2022, doi: https://doi.org/10.31004/basicedu.v6i1.2170.

[38] R. S. Akbar, H. A. Taqi, A. A. Dashti, and T. M. Sadeq, "Does e-reading enhance reading fluency?" *English Language Teaching*, vol. 8, no. 5, pp. 195–207, 2015, doi: https://doi.org/10.5539/elt.v8n5p195.

[39] A. C. Cheung and R. E. Slavin, "How features of educational technology applications affect student reading outcomes: A meta-analysis," *Educational Research Review*, vol. 7, no. 3, pp. 198–215, 2012, doi: https://doi.org/10.1016/j.edurev.2012.05.002.

[40] A. C. Cheung and R. E. Slavin, "Effects of educational technology applications on reading outcomes for struggling readers: A best-evidence synthesis," *Reading Research Quarterly*, vol. 48, no. 3, pp. 277–299, 2013, doi: https://doi.org/10.1002/rrq.50.

[41] N. L. Saine, M. K. Lerkkanen, T. Ahonen, A. Tolvanen, and H. Lyytinen, "Computer-assisted remedial reading intervention for school beginners at risk for reading disability," *Child Development*, vol. 82, no. 3, pp. 1013–1028, 2011, doi: https://doi.org/10.1111/j.1467-8624.2011.01580.x.

[42] C. Hasanudin, "Pembelajaran membaca permulaan dengan menggunakan media aplikasi Bamboomedia BMGames Apps pintar membaca sebagai upaya pembentukan karakter siswa SD menghadapi MEA [Teaching early reading using Bamboomedia BMGames Apps to build primary students' characters]," *PEDAGOGIA: Jurnal Pendidikan [Educational Journal]*, vol. 5, no. 1, pp. 1–12, 2016, doi: https://doi.org/10.21070/pedagogia.v5i1.84.

[43] F. Nami, "Educational smartphone apps for language learning in higher education: Students' choices and perceptions," *Australasian Journal of Educational Technology*, vol. 36, no. 4, pp. 82–95, 2020, doi: https://doi.org/10.14742/ajet.5350.

[44] S. T. Palangngan, "The implementation of hello English smartphone application in enhancing students' vocabulary mastery," *IDEAS: Journal on English Language Teaching and Learning, Linguistics and Literature*, vol. 10, no. 1, pp. 415–423, 2022, doi: http://dx.doi.org/10.24256/ideas.v10i1.2741.

[45] R. Al-Jarf, "Mobile fiction apps for enhancing EFL students' reading and appreciation skills," *International Journal of Linguistics Studies*, vol. 2, no. 2, pp. 15–23, 2022, doi: https://doi.org/10.32996/ijls.2022.2.2.3.

[46] M. B. Nawaila, S. Kanbul, U. M. Kani, and M. M. Magaji, "DLMA_NEU: Digital literacy mobile application for children," *International Journal of Interactive Mobile Technologies*, vol. 16, no. 8, 2022, doi: http://dx.doi.org/10.3991/ijim.v16i08.25213.

[47] K. Saidah and R. Damariswara, "Development of interactive folklore based on android oriented to local wisdom to improve reading comprehension of elementary school students," *Al Ibtida: Jurnal Pendidikan Guru MI*, vol. 8, no. 2, pp. 276–290, 2021, doi: http://dx.doi.org/10.24235/al.ibtida.snj.v8i2.7035.

[48] A. Laila, C. A. Budiningsih, and K. Syamsi, "Textbooks based on local wisdom to improve reading and writing skills of elementary school students," *International Journal of Evaluation and Research in Education*, vol. 10, no. 3, pp. 886–892, 2021, url: https://ijere.iaescore.com/index.php/IJERE/article/view/21683.

[49] A. Amaliyah, F. Rahman, and S. Maryam, "Enhancement school competitiveness through a literacy culture based on local wisdom," *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini [Journal of Childhood Education]*, vol. 6, no. 3, pp. 2325–2333, 2022, doi: http://dx.doi.org/10.31004/obsesi.v6i3.2094.

[50] S. Sukma, A. Abbas, and A. Gheisari, "Development of authentic assessment in local wisdom-based reading learning," *Education Research International*, vol. 2022, 2022, doi: https://doi.org/10.1155/2022/4905583.

[51] S. Syarifuddin, Buku ajar kearifan lokal daerah Sumatera Selatan [Textbook of local wisdom in South Sumatera], Palembang: Bening Media Publishing, 2021.

[52] B. H. Hartono, W. D. Trisnasari, G. Goziyah, E. C. Rochmah, and M. D. Fauzan, "Kearifan lokal dalam cerita rakyat Provinsi Banten sebagai upaya mengembangkan sejarah kebudayaan Banten: Local wisdom in folklore of Banten Province As an effort to develop the cultural history

of Bante," *Jurnal Bastrindo*, vol. 3, no. 1, pp. 14–27, 2022. https://doi.org/10.29303/jb.v3i1.261.

[53] M. R. Al Musafiri, S. Utaya, and I. K. Astina, "Potensi kearifan lokal suku using sebagai sumber belajar geografi SMA di Kabupaten Banyuwangi [Local wisdom potential of using tribe as geography learning source for senior high scool in Banyuwangi Regency]," *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan [Educational Journal: Theory, Research, and Development]*, vol. 1, no. 10, pp. 2040–2046, 2016, doi: http://dx.doi.org/10.17977/jp.v1i10.7955.

[54] S. Affandy, "Penanaman nilai-nilai kearifan lokal dalam meningkatkan perilaku keberagamaan peserta didik [Instilling local wisdom values to improve students' religious behavior]," *Atthulab: Islamic Religion Teaching and Learning Journal*, vol. 2, no. 2, pp. 201–225, 2017, doi: https://doi.org/10.15575/ath.v2i2.3391.

[55] O. A. Wijayanto, "Kearifan lokal (local wisdom) dalam praktik bisnis di Indonesia [Local wisdom in Indonesian business practice]," *FORUM*, vol. 40, no. 2, pp. 6–11, 2015, https://ejournal.undip.ac.id/index.php/forum/article/view/8201/6721.

[56] N. U. Napitupulu, "Strategi pemasaran pariwisata budaya Mentawai melalui produk kesenian Muturuk [Marketing strategy for Mentawai cultural tourism through Muturuk art products]," *Jurnal Desain dan Seni [Journal of Design and Art]*, vol. 2, no. 1, pp. 59–66, 2015, https://publikasi.mercubuana.ac.id/files/journals/15/articles/606/submission/original/606-1443-1-SM.pdf.

[57] E. Indrizal, "Bilou dan tantangan mengkonservasinya di Mentawai: Sebuah tinjauan dari perspektif sosial budaya [Bilou and challenges of conserving it in Mentawai: An overview from socio-cultural perspective]," *Jurnal Antropologi: Isu-Isu Sosial Budaya [Anthropology Journal: Socio-Cultural Issues]*, vol. 18, no. 1, pp. 51–56, 2016, doi: https://doi.org/10.25077/jantro.v18.n1.p51-56.2016.

[58] A. Munandar, M. Noer, E. Erwin, and R. Syahrini, "Keragaman bentuk kearifan lokal masyarakat Suku Mentawai di kawasan Wisata Bahari Pulau Siberut [The diversity of Mentawai local wisdom in the Marine Tourism area of Siberut Island]," *Menara Ilmu*, vol. 16, no. 1, pp. 1–10, 2022, doi: https://doi.org/10.31869/mi.v16i1.3243.

[59] B. Lelono and R. Widjatini, "Wujud kearifan lokal dalam bentuk dan fungsi folklor lisan Banyumas [Local wisdom form and function of Banyumas oral folklore]," *Jurnal Lingua Idea*, vol. 10, no. 2, pp. 63–73, 2019, doi: https://doi.org/10.20884/1.jli.2019.10.2.1581.

[60] I. Meliono, "Understanding the Nusantara thought and local wisdom as an aspect of the Indonesian education," *Tawarikh*, vol. 2, no. 2, 2011, doi: https://doi.org/10.2121/tawarikh.v2i2.392.

[61] C. Hasanudin, A. Fitrianingsih, D. N. P. Utomo, and N. Fitriyana, "Android based material to teach early reading for primary students using Construct 2Apps," *Ingenierie des Systemes d'Information*, vol. 27, no. 6, 2022, doi: https://doi.org/10.18280/isi.270609.

[62] I. R. A. P. Jati, "Local wisdom behind Tumpeng as an icon of Indonesian traditional cuisine," *Nutrition & Food Science*, vol. 44, no. 4, pp. 324–334, 2014, doi: http://dx.doi.org/10.1108/NFS-11-2013-0141.

[63] M. Fuad, E. Anwar, and U. M. Ulul, "The use of pepaccur local wisdom for Indonesian literary teaching materials," *Jurnal Pendidikan Indonesia (JPI)*, vol. 9, no. 2, pp. 213–223, 2020, doi: https://doi.org/10.23887/jpi-undiksha.v9i2.22779.

[64] J. V. D. Akker, B. Bannan A. E. Kelly, N. Nieveen, and T. Plomp, *Educational Design Research. Part A: Introduction*, Enschede: Netherlands institute for curriculum development, 2013.

[65] M. B. Miles and A. M. Huberman, *Analisis data kualitatif: Buku sumber tentang metode-metode baru* [Qualitative Data Analysis: Book Source about New Methods], Terjemahan Tjetjep Rohendi Rohidi [Translated by Tjetjep Rohendi Rohidi], Indonesia: Universitas Indonesia Press, 2017.

[66] H. Retnawati, *Quantitative Analysis of Research Instruments*, Yogyakarta: Parama Publishing, 2016.

[67] D. Rosala and A. Budiman, "Local wisdom-based dance learning: Teaching characters to children through movements," *Mimbar Sekolah Dasar*, vol. 7, no. 3, pp. 304–326, 2020, doi: https://doi.org/10.17509/mimbar-sd.v7i3.28185.

[68] A. Febriani, G. Setiadi, and H. Pratama, "Development of dramatic play book based on kudus local wisdom for children," *ICCCM Journal of Social Sciences and Humanities*, vol. 1, no. 1, pp. 16–22, 2022, doi: https://doi.org/10.53797/icccmjssh.v1i1.3.2022.

[69] D. Gularso, S. Sugito, and Z. Zamroni, "Kawruh pamomong: Children education based on local wisdom in Yogyakarta," *Jurnal Cakrawala Pendidikan*, vol. 38, no. 2, pp. 343–355, 2019, doi: https://doi.org/10.21831/cp.v38i2.21556.

[70] A. Joyo, "Gerakan literasi dalam pembelajaran bahasa Indonesia berbasis kearifan lokal menuju siswa berkarakter [Literacy program in Indonesian language learning based on local wisdom to create students' characters]," *Jurnal Kajian Bahasa, Sastra, dan Pengajaran (KIBASP) [Journal of Language, Literature, and Teaching]*, vol. 1, no. 2, pp. 159–170, 2018, doi: https://doi.org/10.31539/kibasp.v1i2.193.

[71] W. Annisa and R. Rinaldi, "Kemampuan membaca pemahaman dengan strategi The Cognitive Academic Language Learning Approach (Calla) berbasis kearifan lokal siswa kelas VII SMP Negeri 18 Padang [Students' reading understanding using strategy of Calla based on local wisdom]," *Puitika*, vol. 13, no. 2, pp. 216–223, 2017, doi: http://dx.doi.org/10.25077/puitika.13.2.216--223.2017.

[72] I. F. Falah and R. Kusumah, "Respon siswa terhadap bahan ajar membaca berbasis kearifan lokal [Students' responses on local wisdom-based reading materials]," *Jurnal Lensa Pendas*, vol. 8, no. 1, pp. 46–51, 2023, doi: https://doi.org/10.33222/jlp.v8i1.2607.

[73] R. Suhartini, K. Kartono, S. Suparjan, H. Hamdani, and H. Kresnadi, "Kelayakan buku suplemen membaca permulaan berbasis kearifan lokal pada kelas II sekolah dasar [The feasibility of local wisdom-based early reading book for second grade of primary school]," *FONDATIA*, vol. 7, no. 1, pp. 80–95, 2023, doi: https://doi.org/10.36088/fondatia.v7i1.2965.

[74] Y. Barella, "Pengembangan bahan ajar berbasis kearifan lokal dalam meningkatkan minat membaca mahasiswa UNTAN "Dinamika Pernikahan Kalimantan Barat (Melayu Sambas, Tionghoa dan Dayak Tamambaloh) [Development of local wisdom-based material in improving students' reading intention]," *Indonesian Journal of Learning Studies (IJLS)*, vol. 1, no. 1, pp. 39–46, 2021, url: https://dmi-journals.org/ijls/article/view/18.

[75] D. Samaya, "Desain dan validasi buku cerita bergambar membaca dini berbasis kearifan lokal Sumatera Selatan [Design and validation of picture story book for early reading based on South Sumatera local wisdom]," *Jurnal Ilmiah Bina Bahasa [Scientific Language Journal]*, vol. 14, no. 2, pp. 85–95, 2021, doi: https://doi.org/10.33557/binabahasa.v14i2.1433.

[76] T. N. Cholifah and A. Muslihasari, "Pengembangan digital flipbook berbasis dolanan lokal untuk meningkatkan literasi membaca siswa SD di Desa Palaan pada era covid-19 [Development of digital flipbook based on local games to improve students' reading literacy at Palaan village in the Covid-19 era]," *Jurnal Bidang Pendidikan Dasar [Journal of Primary Education]*, vol. 6, no. 2, pp. 149–158, 2022, doi: https://doi.org/10.21067/jbpd.v6i2.6843.

[77] M. Maemunah, "Education marginalization of bajo children based on local wisdom," *International Journal of Educational Research and Social Sciences (IJERSC)*, vol. 2, no. 3, pp. 585–591, 2021, doi: https://doi.org/10.51601/ijersc.v2i3.80.

[78] D. K. Nasution, T. W. Emelia, and S. L. Izar, "Local wisdom in traditional Malay games as a media for cultural preservation and instilling character values of nationalism in children," *Journal of Education, Humaniora and Social Sciences (JEHSS)*, vol. 4, no. 3, pp. 1952–1958, 2022, doi: https://doi.org/10.34007/jehss.v4i3.989.

[79] K. A. Hakam, W. Setiawan, and M. Agustin, "Developing of augmented reality media containing Grebeg Pancasila for character learning in elementary school," *Ing ́nierie des Syst ̀mes d'Information*, vol. 27, no. 2, 2022, doi: https://doi.org/10.18280/isi.270208.

[80] J. P. A. U. Dini, "Thematic learning in kindergarten based on Al-Islam Kemuhammadiyahan and local wisdom," *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, vol. 5, no. 2, pp. 2220–2230, 2021, doi: https://doi.org/10.31004/obsesi.v5i2.1171.

[81] L. Muzdalifah and H. Subrata, "Pengembangan big book berbasis kearifan lokal untuk pembelajaran membaca permulaan di SD [Development of local wisdom-based big book for early reading at primary school]," *Jurnal Review Pendidikan Dasar: Jurnal Kajian Pendidikan dan Hasil Penelitian [Journal of Elementary School Review: Journal of Educational Study and Research Result]*, vol. 8, no. 1, pp. 44–53, 2022, doi: https://doi.org/10.26740/jrpd.v8n1.p44-53.

[82] L. A. I. U. Khasanah, I. E. Ningrum, and M. M. Huda, "Pengembangan game edukasi berbasis kearifan lokal berorientasi dalam peningkatan kemampuan membaca permulaan di sekolah dasar [Development of educational games based on local wisdom in improving early reading skill at primary school level]," *Jurnal Basicedu*, vol. 7, no. 1, pp. 760–770, 2023, doi: https://doi.org/10.31004/basicedu.v7i1.4539.

[83] D. B. W. Putro, W. Widowati, and N. H. Nufalina, "Meningkatkan minat membaca anak-anak berbasis literasi kearifan [Improving students' reading intention based on wisdom literacy]," *Jurnal PkM Pengabdian kepada Masyarakat [Journal of Community Service]*, vol. 5, no. 4, pp. 451–455, 2022, doi: http://dx.doi.org/10.30998/jurnalpkm.v5i4.13777.

[84] I. A. Susanti, E. Handoyo, and S. S. Sumarti, "Pengembangan buku cerita IPS berbasis kearifan lokal untuk meningkatkan kemampuan literasi membaca pada tema pahlawanku kelas IV SD [Development of social science story books to improve students' reading literacy on the theme of my hero]," *Jurnal Basicedu*, vol. 6, no. 2, pp. 2515–2525, 2022, doi: https://doi.org/10.31004/basicedu.v6i2.2448.

[85] I. Y. Rahmawati, "Kelayakan materi komik berbasis kearifan lokal Reog Ponorogo sebagai bahan bacaan kategori membaca permulaan pada pendidikan anak usia dini [Feasibility of local wisdom-based comics of Reog Ponorogo as early reading material for young learners]," *JURNAL AUDI: Jurnal Ilmiah Kajian Ilmu Anak dan Media Informasi PAUD [Scientific Journal of Children Study and Media Information]*, vol. 5, no. 1, pp. 1–10, 2020, doi: https://doi.org/10.33061/jai.v5i1.3770.

[86] W. Annisa, "Pembelajaran membaca pemahaman dengan metode Computer Assisted Language Learning (CALL) melalui CD interaktif berorientasi kearifan lokal [Teaching reading using CALL through interactive compact discs based on local wisdom]," *Pakar Pendidikan [Educational Expert]*, vol. 15, no. 1, pp. 79–90, 2017, doi: https://doi.org/10.24036/pakar.v15i1.55.

[87] S. Lestari, A. Kusdiana, and A. Mulyadiprana, "Buku cerita Situ Patenggang sebagai sumber belajar kearifan lokal di sekolah dasar [Situ Patenggang story book as local wisdom-based material for elementary school]," *PEDADIDAKTIKA: Jurnal Ilmiah Pendidikan Guru Sekolah Dasar [Scientific Journal of Primary School Teacher]*, vol. 7, no. 3, pp. 124–132, 2020, doi: https://doi.org/10.17509/pedadidaktika.v7i3.25367.

[88] N. Kurniawati, A. Adawiyah, and M. F. Munsi, "Memadukan inovasi dan kearifan lokal dalam pengajaran literasi pada anak usia dini: Pendampingan gerakan literasi [Combining innovation and local wisdom in teaching literacy for young learners: literacy support]," *JE (Journal of Empowerment)*, vol. 2, no. 1, pp. 125–138, 2021, doi: https://doi.org/10.35194/je.v2i1.1229.

[89] H. U. Nisa and T. Supriyanto, "Pengembangan bahan ajar membaca sastra legenda bermuatan kearifan lokal berbahasa Jawa [Reading material development of legendary literature with Javanese local wisdom]," *Seloka: Jurnal Pendidikan Bahasa dan Sastra Indonesia [Journal of Indonesian Language and Literature]*, vol.5, no. 2, pp. 192–200, 2016, https://journal.unnes.ac.id/sju/index.php/seloka/article/view/13083.

[90] P. S. Pernantah, M. Rizka, C. Handrianto, and E. Syaputra, "Inovasi bahan ajar pendidikan IPS berbasis digital flipbook terintegrasi local wisdom dalam menunjang perkuliahan jarak jauh [Innovation of social science materials based on digital flipbook integrated with local wisdom to support distance learning]," *J-PIPS (Jurnal Pendidikan Ilmu Pengetahuan Sosial) [Educational Journal of Social Science]*, vol. 8, no. 2, pp. 136–145, 2022, doi: https://doi.org/10.18860/jpips.v8i2.14886.

Copyright © 2024 by the authors. This is an open access article distributed under the Creative Commons Attribution License which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited (CC BY 4.0).