Mobile Application Design of Learning Word in Lamaholot Language for Children Using User-Centered Design

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Abstract—Indonesia is a country with a variety of regional languages that characterize the nation. Every region in Indonesia has its local language and with its dialect and is characteristic of the region. Regional languages have become a long-established identity. Unknowingly, Indonesia is experiencing an increasingly rapid cultural change in which young generations are already in a condition where many require them not to use their local language. Also, data collected by UNESCO shows that there are approximately 30 regional languages that are endangered and, on average, are in eastern Indonesia. Facing the existing problems, this study aims to help young people to get to know their local languages through mobile applications. The local language used in this research is the "lamaholot" language, which is one of the native languages of the people of East Flores Regency and uses the user-centered design method. The design will be tailored to the user so that it can be more attractive and according to user needs. Respondents were taken as many as 147 children with an average age between 10 years to 14 years who are people in East Flores Regency.

Keywords—Mobile Application, user-centered design, children education.

1 Introduction

Indonesia is a country with many cultures. One culture that reflects Indonesia is the local language. Every region in Indonesia has its local language and with its dialect and its characteristics. Regional languages are, in fact, the first language or mother tongue of a child and are inherited from parents. Although there are national languages that are already regulated in the law and are also used in everyday life.

The Ministry of Education and Culture Development and Language Development Agency conducted 2,468 observations from 1991 to 2018. The agency mapped and verified 688 regional languages of Indonesia. (this number does not include dialects and sub-dialects) [1] and demands for how this inherited culture can be preserved and maintained so that future generations can use their local language [2].

This demand is in line with research conducted by [3] and the Regional Language Protection Policy In Indonesia Cultural Change issued in 2018 [4] and stated in the Law

of the Republic of Indonesia No. 24 of 2009 concerning the Flag, Language, and Symbol of the State, as well as the National Anthem [5]. The policy issued is critical to be implemented because it sees that Indonesian cultural changes lead to the extinction of many regional languages inherited from their ancestors [6].

Some cases that can be used as examples can be obtained from the UNESCO Atlas of the World's Languages in Danger website. There are 30 regional languages in Indonesia that are endangered and, on average, are in eastern Indonesia [7]. Also, several main factors are causing this, and firstly, local languages have decreased in prestige due to the strengthening of the position and function of Indonesian as a national language. Second, social relations are increasingly sophisticated and globalized, which in turn, forms a pragmatic attitude to choose to master the language that allows us to be part of the national and global society [8].

The solution that can help children in learning local languages is by utilizing information technology such as smartphones based on previous research by [9] and [10], children have an interest in multimedia through smartphones with a drastic increase in the use of smartphones [11], whether the user is to communicate, study or play. This certainly can be utilized, so that it can be used more effectively and productively in the learning process for children [12].

In this research, information technology created is a mobile application design, where a child can quickly learn and understand what he knows using a smartphone so that it can help in the learning process, especially in the context of human language learning whereas the local language used in this study is "lamaholot", which is one of the native languages of the people of East Flores Regency.

In mobile application design for children learning, the most important thing is how the learning process can be packaged excitingly so that it can stimulate children to feel at home in the intended learning [13]. User-centered design (UCD) is a method used to see the level of success in terms of system interfaces [14], this method can be used for the application of "lamaholot" local language learning for children. The critical thing to note in this method is usability, function, and design aesthetics.

Seeing the characteristics of the UCD method well as the character of understanding children's learning, as explained above, there is a very close relationship. Where the existing system will be tailored to the needs of its users, in this case, the needs of children, the interface offered will be seen from the user's side, where the display will be tailored to the needs of children.

The mobile application design created will be tested using a usability test with a questionnaire distributed as many as 147 children with an age range between 10 years to 14 years and then will be tested for usefulness, effectiveness, efficiency, and satisfaction based on each function or task of the design mobile application built. By doing tests like this can answer essential elements that exist in the UCD, namely ease of use, ease of learning, and user satisfaction [15].

With the mobile design, the "lamaholot" regional language learning application using user-centered design can be beneficial for children in East Flores Regency in knowing their local language. Also, it can preserve the cultural heritage that has been inherited starting from providing early education to children, because they are the successors to the nation, and these demands are following what has been mandated in the law.

2 Literature Review

Several previous studies are taken from several journals and related sources and used as a reference so research on the "lamaholot" regional language learning mobile of application for children using UCD is proposed in this study. With the many developments in information technology, many areas of life use this to help their daily lives. As research conducted by Athanasios S. Drigas, et al, who use information technology to implement the results of teaching and learning methods to understand the concepts of physics [16].

In the research of Mattheiss et al., The author helps blind people to practice their orientation and mobility by making a game and using the UCD method [17]. Whereas in the Bateman, et al. Study, the authors assisted the blind in learning mathematical concepts where this research focused on the user-centered design and analysis of the electrostatic touch screen system to display graphically based visual information to individuals with visual impairments [18].

Another related paper was conducted by Risald et al., in which the authors used the UCD method to help deaf people make medical emergency calls without audio communication. In this study, deaf people only need to choose the icons that correspond to the situation faced in a touchscreen mobile device [19]. Then with the same case study with Bateman et al., Tama-yo-Moreno, and Pérez-marín's research helping students understand mathematical problems using the UCD method, the use of this methodology are used to design pedagogic agents to teach any subject ranging from secondary education to pre-primary school [20].

Research by Gačnik et al. Made and explained the design of a tablet application that uses the FRAME model to provide improved therapy through technology for children with speech disorders and investigate the impact of application use on SLPP (Speech and Language Pathology Practice) using the UCD method [21]. Then in terms of the learning process or techniques delivered through digital platforms, conducted by Ján Záhorec et al. [22]. Research conducted in connection with the learning process through games with digital platforms for children has been carried out in research conducted by Novera Kristianti et al., which discusses the use of multimedia technology for virtual education by doing per-toys in the form of playing puzzles for young children in Indonesia [23].

From some of the research described above, the user-centered design method can help users in terms of a convenient system interface for various needs, especially for users with special needs. In this research, it becomes a new thing in the application of user-centered design methods to do local language learning in children. In addition to adjusting user needs for the system interface, this research can help preserve the cultural heritage of the "lamaholot" regional language itself.

3 Method and Materials

The focus of this research is the design of mobile applications for "lamaholot" regional language learning for children who take case studies in the East Flores District

by using the user-centered design method. The stages of the research carried out and can be seen in Fig.1.

3.1 Data collection

There are two activities in this stage, namely literature study and field study. A literature study is done by studying references that are appropriate to the research topic. This study was conducted to obtain information related to the research topic. Field studies conducted by observing and taking user needs by distributing questionnaires.
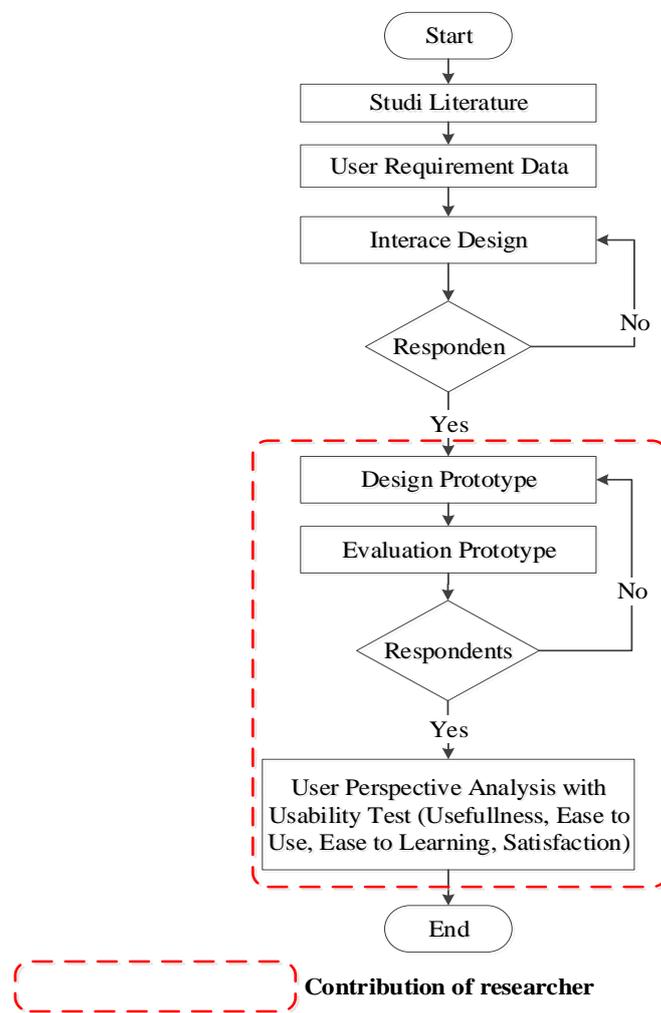

Fig. 1. Research Flow Chart

In this paper, the method used is to use a user-centered design. As seen in Fig.1, the research begins by conducting a literature study, and this is considered essential because the author can find out the development of previous research and find out more deeply about the topic being worked on. The next step has already begun by taking data on user needs, which will be given an initial questionnaire that can assist researchers in knowing the user needs for the use of the system later (respondents who are willing will continue to follow the process that takes place in this study).

In the next stage, interface design has been carried out, which will then be evaluated by respondents. At this stage, before the interface design is not following the needs of the user, the process will continue to undergo evaluation from respondents. After the user needs are following the next step, the prototype design will continue to be evaluated by the respondent to the point where the user needs are appropriate.

In the last stage, a user perspective analysis is performed using the usability test. Usability test analysis conducted will see Usefulness, Ease to Use, Ease to Learning, and Satisfaction. From the analysis made will be seen the level of success obtained by the system in user-centered design.

3.2 Stage of needs analysis

There are two activities in this stage, namely identifying the characteristics and needs of the user and identifying the design characteristics of the learning application that will be created. The requirements analysis framework is seen in table 1.

Table 1. Requirement Analysis Framework

Needs	Activity	
Characteristics and User Needs	a.	Identify user limitations in learning
	b.	Identify the strengths/strengths of users in learning
	c.	Identify the parts where the difficulty of the user in learning the local language "lamaholot"
Characteristics of application to be made	a.	What will be highlighted from the application design that will be made
	b.	What is minimized from the design of the application to be made
	c.	What elements are expressly provided for children

In table 1 is a framework of needs analysis carried out in this study. This framework will guide the two activity needs. Then the needs analysis is also done using the UCD process cycle where there are stages that will be passed repeatedly when the user's needs have not been met. The stages of the UCD cycle process include: plan the human-centered design process that is planning the interface design by looking at the needs of users obtained when observing in the East Flores Regency of East Nusa Tenggara Province. In the second stage is understanding specifying the context of use that is understanding user needs for products that are built as well as understanding the environment of these users, continued in the third stage is specifying the user requirements that is determining the user's specifications based on the criteria that exist in the field, at the

fourth stage is the product design solution that is to design a system in the form proto-type and the like. The last stage is evaluating the design that is evaluating the results of the design to get feedback to further improve the product (ISO 9241-210, 2010) [24].

3.3 Result of need analysis

Regional languages are the languages spoken from generation to generation. How-ever, the reduction of speakers who will pass on language becomes a new problem that must be resolved. From the analysis that has been carried out to find out the needs of users, several general requirements that have been obtained, include:

- The age of the object of this research is the age of children with a range of ages between 10 years to 14 years, and most can use smartphones.
- Due to the lack of "lamaholot" language speakers, children with the age range in question are very lacking in knowledge about "lamaholot" language in the sense of lacking in vocabulary and understanding conversations in "lamaholot" language.
- The interface used in the application is offered in the form of grids, and the text presented is clear to read.
- The presentation of "lamaholot" language learning is still at an early stage or is still at the elementary level.
- Color selection is adjusted to the user's characteristics.

The results of user requirements obtained will be a reference in the next process. Referring to the purpose of the method used in this study, the process will continue to be repeated until the user's needs will be fulfilled, as explained in the previous section.

3.4 Questionnaire

To be able to analyze the results of the proposed system design, whether it is follow-ing user needs based on measuring the perspective of the user-centered design, the ques-tionnaire questions are distributed to respondents to get feedback so that they can be used as conclusions in this study. These questions are relevant to the system design interface and perceived usefulness, as shown in table 2.

Table 2. Questionnaire

No.	Statement					
Information:						
1: Strongly Disagree	*2: Disagree*		*3: Neutral*	*4: Agree*	*5: Strongly agree*	

No.	Statement	Score				
		1	2	3	4	5
USEFULNESS						
1	The design of this system helped me become more effective in learning the "lamaholot" local language	○	○	○	○	○
2	This system design is useful for learning "lamaholot" language	○	○	○	○	○
3	The design of this system is following my need to learn "lamaholot" language	○	○	○	○	○
4	The design of this system works according to what I expect	○	○	○	○	○
EASE OF USE						
5	This system design is easy to use to learn "lamaholot" language	○	○	○	○	○
6	The design of this system is practical for use in learning the "lamaholot" language	○	○	○	○	○
7	Users easily understand the design of this system	○	○	○	○	○
8	I can use this system design without written instructions	○	○	○	○	○
EASE OF LEARNING						
9	I learned to use this "lamaholot" language learning system design quickly	○	○	○	○	○
10	I easily remember how to use this system design	○	○	○	○	○
11	The design of this system is easy to learn how to use	○	○	○	○	○
12	I quickly became skilled with the design of this system	○	○	○	○	○
SATISFACTION						
13	I am satisfied with the design of this system	○	○	○	○	○
14	I would recommend this system design to my friends	○	○	○	○	○
15	The design of this system is fun to use in learning "lamaholot" language	○	○	○	○	○
16	I feel I must have/use this system design to learn "lamaholot" language	○	○	○	○	○

Table 2 shows that there were 16 questions given to respondents or children. This question was adopted from the USE standard questionnaire [25] by taking a few questions following the needs of the case studies being faced. The question uses a 5 Likert scale answer format that strongly disagrees, disagree, neutral, agree, and strongly agree.

4 Result and Discussion

4.1 Interface design

The results of gathering the needs of users have obtained several needs that are desired by the user and have been applied to the prototype of the "lamaholot" local language learning design that has been made. The result of the design is in Fig.2, which is the starting page, and becomes the entrance to start this learning application. In the initial page design, there are two buttons, the learning button on the left and the play button on the right.

In Fig.3 is a "lamaholot" page for language learning. There are three choices of learning presented, namely learning verbs, learning body parts, and learning animal

names. In Fig.4 is a game page. After the user learns, the user can hone his skills by doing simple games. The game presented is a body part puzzle, guess the name of the animal and guess the language "lamaholot".
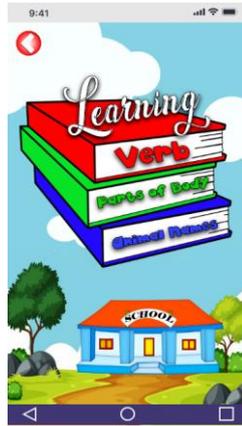

Fig. 2. Homepage

Fig. 3. Learning page

Fig. 4. Game page

Fig.5 is a page to learn verbs and continuation of learning pages. The verb page presents verbs in "lamaholot" and their meanings that are commonly used in people's daily lives. While in Fig.6 is the page to learn parts of the body in the area served illustration of selected parts of the body. Similarly, Fig.7 is a page learn animal names in the local language with illustrations of animals presented selected.

Fig. 5. Verb Learning Page

Fig. 6. Body Parts Learning Page

Fig. 7. Learning Pages Animal Names

In Fig.8 is a playground puzzle parts of the body, where children will match the body part is displayed with a choice of the name that appears. While in Fig.9 is a playground guess the animal name and Fig.10 is a page Lamaholot play charades language.

Fig. 8. Body Parts Puzzle Page

Fig. 9. Guess the Animal Names page

Fig. 10. Guess the Language Lamaholot Page

Fig.11 is the result of playing the game selected. The result is a value that is answered correctly by the user and is given with an illustration of how many dimensions can be obtained. Each question answered correctly is worth 10.

Fig. 11. Learning Outcomes page

All interface designs that have been described have gone through the entire cycle of the environmental cycle in the UCD process. Where all interface designs already meet the needs of users in terms of "lamaholot" local language learning for children.

4.2 Usability test

Evaluation of the application design that has been passed and approved by following the circle process in the UCD method, then an analysis of usability test perspectives was conducted using a questionnaire with 16 questions that contained four aspects namely usefulness, ease of learning, ease of use and satisfaction distributed to children with an age range between 10 years - 14 years in East Flores Regency. The questionnaires distributed received feedback of 147 responses with the results that can be seen in table 3 and table 4.

Table 3. Top 2 Box Calculation

	Usefulness				Ease Of Use				Ease Of Learning				Satisfaction			
Top Box	22%	44%	48%	31%	29%	28%	51%	62%	27%	21%	21%	42%	46%	25%	21%	25%
Top 2 Box	79%	77%	80%	81%	95%	99%	98%	92%	74%	87%	86%	67%	89%	89%	95%	80%
Mean Top Box	36%				42%				28%				29%			
Mean Top 2 Box	79%				96%				78%				88%			

From table 3, the top 2 boxes are calculated for each aspect counted, namely, usefulness, ease of use, ease of learning, and satisfaction. The calculation is done by only taking the values 4 and 5. For the evaluation of usefulness obtained as much as 79% of respondents agreed that the system offered is useful. Then for the results of the evaluation of ease of use obtained as many as 96% of respondents agreed that the system offered is easy to use. In the ease of learning evaluation, it was found that as many as 78% of respondents stated that the system offered was easy to learn. For the evaluation of the top 2 boxes in the aspect of satisfaction obtained, 88% of respondents said they were satisfied with the learning system offered.

Table 4. Calculation of Confidence Interval

	Usefulness	Ease of Use	Ease of Learning	Satisfaction
t-Distribution	1,6554	1,6554	1,6554	1,6554
Mean	4,0884	4,2925	4,0476	4,2789
Stdev	0,7395	0,4565	0,7055	0,5586
Lower limit	4,0	4,2	4,0	4,2
Upper limit	4,2	4,4	4,1	4,4

After getting the results of the calculation of the top 2 boxes, the calculation of 90% confidence in-sheet is done by using the mode of the results of the questionnaire, as seen in table 3. If tested in the real population or see the calculation of the possibility of the level of confidence obtained that, 90% of respondents Useful answer or offered system is between 4.0 to 4.2 Likert scale, 90% answered system is easy to use or will be between 4.2 to 4.4 Likert scale, 90% answered system is easy to learn or will be between 4.0 to 4.1 Likert scale, 90% answered satisfied with the system offered or would be between 4.2 to 4.4 Likert scale with 5 Likert scales.

5   Contribution

In this research, there are three points that we have made such contributions, namely:

- The design of the "lamaholot" regional language learning mobile application that is built is user-centered design (UCD).
- There has never been a "lamaholot" regional language learning mobile application system created.
- The system offered is one solution that can be provided in facing the challenge of the extinction of regional languages.
- The design of the application is used for the early stages of learning, namely for learning words in lamaholot language.

6   Conclusion

The design of the "lamaholot" regional language learning mobile application for children using the user-centered design method was made to be used in children with an age range between 10-14 years. The learning presented in the design offered is still at a basic level or for beginners. By looking at the results of research that the design that was built could help in preserving and preserving the "lamaholot" regional language so as not to become extinct.

This research can still be developed better in the future. Suggestions that the author can give concerning what has been done is that the design of learning can be added with moving animation and sound, and the addition of "lamaholot" language dictionary features in the application can be used as future development.

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