User Interface / User Experience Design Aksaranesia.co Mobile Based with Design Thinking Approach

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***Abstrak*— One of the comprehensive problems in SMA Intensif Taruna Pembangunan Surabaya is the lack of integrative literacy activities. Therefore, this study aims to design UI/UX Aksaranesia.co, application as one of the efforts to improve the literacy movement in SMA Intensif Taruna Pembangunan Surabaya. The method used is design thinking with five stages: emphasize, define, design, prototype, and testing. Some of the views or features designed are the design system, onboarding screen, sign-up page, log-in page, dashboard page, interactive features, explore page, library page, class page, and profile page. The application Aksaranesia.co is effective for improving GLS in SMA ITP based on the test results. The Aksaranesia.co application is a stimulus given to students to interpret literacy as an activity that is interesting, fun, and close to technology.**

***Keywords*— Aksaranesia.co, Application, Design Thinking, Literacy, SMA ITP**

I. INTRODUCTION

Reading is one of the activities in literacy activities, so it is the key to educational progress. The success of education is not measured by the number of children who get high scores but the number of children who like to read in class. Through reading, learners can broaden horizons, sharpen ideas, and increase creativity [1]. The driver of interest in reading is the ability to read, and the driver for the growth of reading culture is reading habits. Interest in reading that is developed from an early age can be used as a foundation for the development of a reading culture [2]. School is an institution responsible for realizing a reading culture, an essential part of learning activities. In accordance with Law No. 20 of 2003 on the National Education System Chapter III Article 4 paragraph (5) explicitly states that "Education is carried out by fostering a culture of reading, writing, and arithmetic, for all community citizens."

However, the Programme for International Student Assessment (PISA) research shows that Indonesian learners rank 64th and 65th in participating countries in maths, science and reading [3]. The low skill proves that the educational process has not developed students' reading competence and interest in knowledge. The low interest in reading in Indonesia requires follow-up from the government to strive to improve the reading culture. The establishment of a school reading culture can be implemented through the School Literacy Movement (GLS) [4].

GLS can be defined as a program to print students' character by optimizing reading and writing activities [5]. This program is a product of the Regulation of the Minister of Education and Culture number 23 of 2015, concerning the growth of ethics which contains the obligation to read 15 minutes before starting lessons at school. School literacy activities in GLS are the ability to access, understand, and use something intelligently through activities such as reading, viewing, listening, writing, and/or speaking [6].

Based on the results of a case study at SMA Intensif Taruna Pembangunan Surabaya (SMA ITP) through the interview method with the teacher in charge of literacy, it shows that the problem regarding the lack of integrative literacy activities has not been carried out. Students still carry literacy independently without systematic coordination so that control and supervision functions cannot be carried out. As a result, learners gradually abandon literacy activities. Furthermore, through questionnaires and interviews with students, two factors were found that also hinder student literacy activities: the unavailability of reading books at school and home and excessive use of devices, making it difficult for students to manage time.

SMA ITP Surabaya has not been able to find a way to solve these serious problems. Based on needs analysis and idea filtering, a solution was initiated by implementing Aksaranesia.co applications. This application is specifically designed to develop GLS to accommodate the needs of students in literacy needs and maximize the supervisory function based on digital technology. Previous research by [7] developed a web-based literacy information system to increase students' reading interest, but the weakness of this study is that the website only presents works without any supervision and control. Another study by [8] developed a local games-based digital flipbook to improve the reading literacy of elementary school students, the weakness of this study is that it focused on elementary students only and did not show a sustainable literacy movement. Therefore, this study enhances previous research by designing UI/UX applications Aksaranesia.co to support GLS in schools.

II. RESEARCH METHODS

The method used in this study has several stages, starting from the stage of problem identification, literature study and determining research methods, data collection, analysis and recommendations, testing improvement designs, conclusions and suggestions. These stages can be seen in Figure 1.

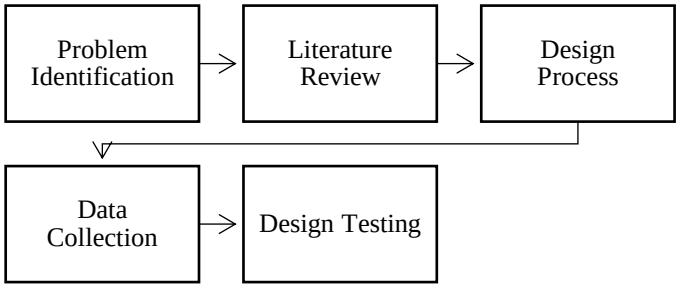


Fig 1. Research Stages

A. Problem Identification

At this stage, researchers identify problems in SMA ITP by conducting several methods such as interviews with GLS support teachers, conducting interviews and distributing questionnaires on problems and needs of students regarding literacy at SMA ITP. The solution to overcome this problem is to design Aksaranesia.co applications to improve the literacy of learners.

B. Literature Review

At this stage, a literature study is carried out to find sources of theory and previous research relevant to the findings of UI/UX design problems in Aksaranesia.co applications. Based on the literature study that has been done, researchers decided to use the Design Thinking method as a problem-solving method then use the Likert Scale to calculate scores on questionnaires then test prototypes to teachers and students.

C. Design Process

Design Thinking is a method with a creative problem-solving approach that focuses on customer empathy [8]–[10]. This design process has five stages: Empathize, Define, Ideate, Prototype and Test [11]. Each stage has a meaning, namely the Empathize Process, which is the process of carrying out activities to find out user needs by conducting various researches. In the Define stage, use to analyze the problems and needs that have been obtained in the previous stage. Ideate describes the solution needed by taking ideas sourced from the previous stage. Meanwhile, in the p process prototype is carried out to implement ideas obtained from the previous stage into a user interface design that can be tested. The Test process is the test of the interface to the user after being prototyped. This testing stage is carried out to get feedback from respondents who test the interface design.

D. Data Collection

Quantitative data collection is carried out by distributing questions to respondents through questionnaires. Where each question that has been made will be scored using the Likert scale. After getting the score from each question that has been made, the next step is to calculate the maximum score (number of respondents times the highest score of likert). To get the final Likert score, the Index (%) will be calculated by means of (Total Score / Maximum Score) x 100. The purpose of calculating the score is to find out whether the problems felt by users in terms of the author's experience of Aksaranesia.co application have similar problems.

E. Design Testing

After the prototype of the repair design is complete, the next stage is to test the Aksaranesia.co application. Testing was conducted by providing pre-test and post-test to 128 students with aspects of need, pleasure, follow-up, awareness, school environment, learning, access to information, and technology. The test aims to determine the effectiveness of Aksaranesia.co application to support GLS in SMA ITP.

III. Results and Discussion

A. *Emphatize and Define*

This stage is done by finding and analyzing user problems and needs. This process is carried out by conducting interviews and distributing questionnaires to teachers as well as learners. It is expected that in the Empathize process, several user problems will be obtained to be processed further at the next stage. Based on the results of the analysis, several problems and needs are formulated as in Table 1. It can be seen that the problems faced by ITP SMA partners are participants who have not used their gadgets to do literacy. There is no team responsible for the implementation of GLS, lack of literature resources, and no coordination of literacy activities. Therefore, to overcome these problems will be adjusted to the features as a solution.

Table 1. Analysis of Problems and Needs

Problems	Needs
Students have not used devices for literacy	Designing Aksaranesia.co as a mobile app-based GLS media.
The school does not yet have a team responsible for GLS implementation.	Design of monitoring features in the Aksaranesia.co application.
Lack of availability of literature sources	Procurement of non-subject digital literature through two Aksaranesia.co features, namely (1) Explore which contains various literature sites; and (2) Library containing more than 200 digital books
No coordination of literacy activities	Integrative GLS through Aksaranesia.co for 15 minutes before learning activity is over.

B. *Designed*

In this process, ideas are taken from the previous Empathize and Define processes. Ideas are sourced from Table 1 that has been collected by the author and which allows for prototyping by the author. At this stage the list of user needs will be changed

to solve problems which will then be used as a reference in making prototypes.

Table 2. Problem Solving based on Needs

Needs	Problem-Solving(s)
Application design Aksaranesia.co	Aksaranesia.co application UI/UX design
Design of monitoring features in Aksaranesia.co applications	Establish a point system that is obtained after students read books and do writing
Procurement of non-subject digital literature	Input 200 non-subject digital books into the Aksaranesia.co application and add various digital literature source links
Coordination of literacy activities	Assemble a development team that will oversee the use of Aksaranesia.co that SMA ITP Student Affairs have authorized

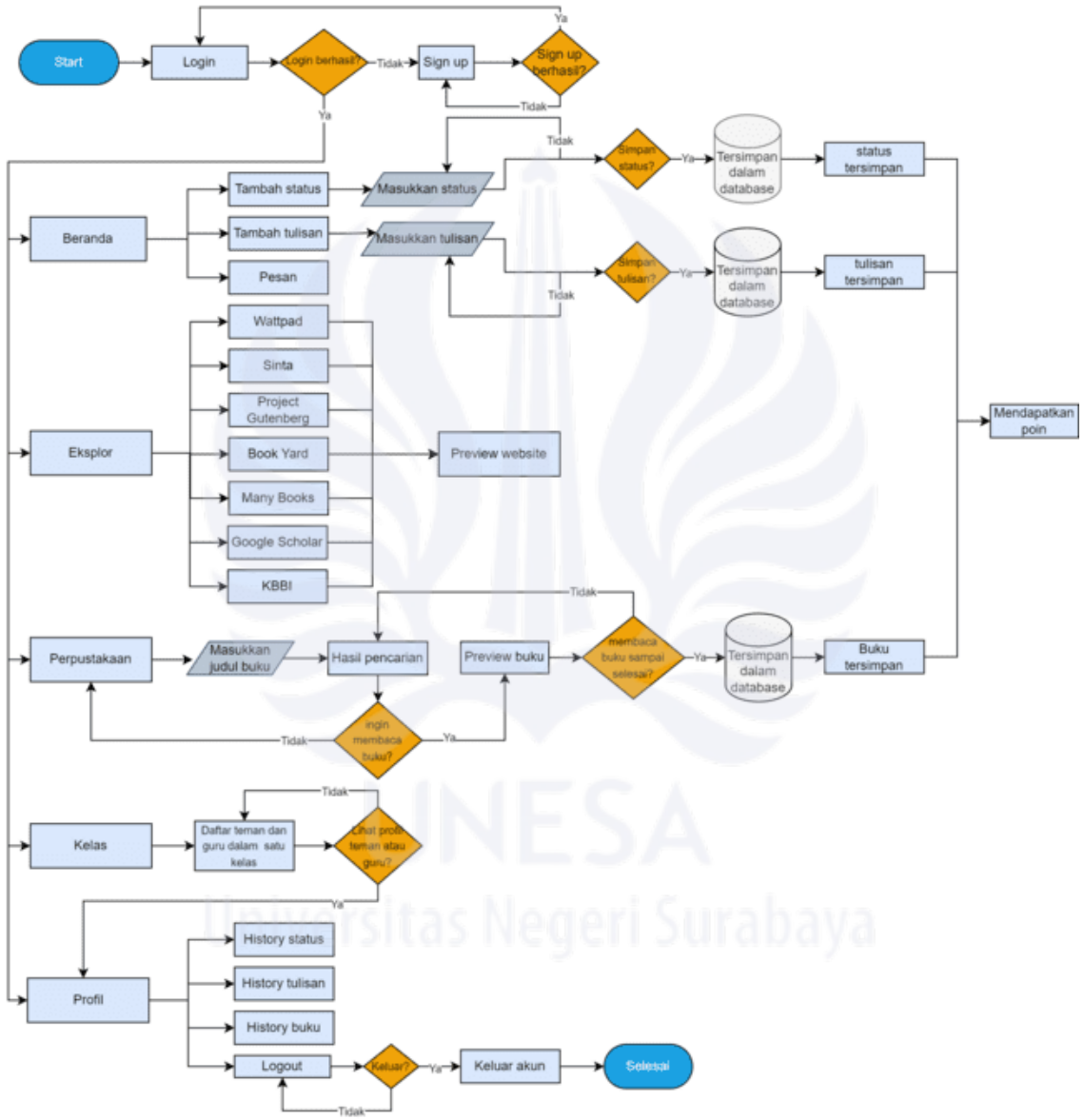


Fig. 2 Application Flowchart Aksaranesia.co

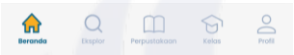
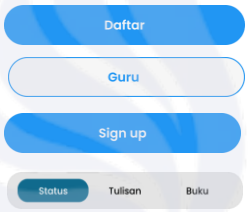
C. *Prototype*

This stage will produce an interface design based on solving problems at the Ideate stage so that it becomes a form of user interface design (prototype). The design made is high-fidelity which can be tested at the next stage, namely the Test stage. Before starting the design creation, the author compiles a flowchart of the Aksaranesia.co application. Making flowcharts serves to provide a more detailed overview of application features and flows as seen in Figure 2.

Furthermore, a visual component of application design will be created, namely a design system. Design systems are groups

of elements containing design components and assets used in developing applications.

Table 3. Visual Components of Aksaranesia.co

Component Name	Visual Design
Frame	Android Large (360 x 800 pixels)
Primary Color	A1CCED D9D9D9 F6F6F6
Secondary Colors	F9AD23 106A8D 2196F3
Application Logo	
Icon Botom Navbar	
Application Button	
Font	Font Poppins AaBbCcDdEeFf Type: Reguler Medium Semibold Bold Extra Bold Size: 13, 15, 18, 20, 28, 30

Here is the Aksaranesia.co interface has developed:

1. Onboarding Screen Page

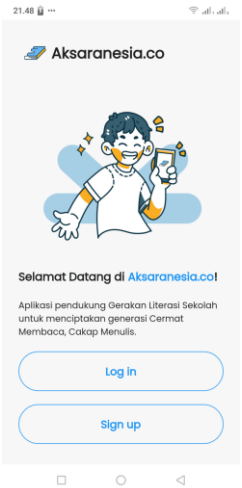


Fig. 3 Onboarding Screen

The initial display when the user opens the Aksaranesia.co application is like in Fig. 1 Onboarding Screen. In the initial screen, there is an illustration of a boy operating the Aksaranesia.co application cheerfully and enthusiastically, along with a welcome greeting. Furthermore, users who already have an account can press the 'Log in' button while users who do not have an account must press the 'Sign up' button.

2. Sign up Page

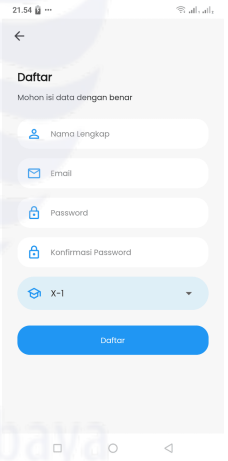


Fig. 4 Sign up Page

Suppose users do not have a registered account. In that case, users can register by pressing the 'Sign up' menu and writing down the required data in the available fields, namely full name, email, password, password confirmation, and class. When choosing a class, a little care is required, because users cannot switch classes on their own when choosing the wrong one. However, users can immediately contact the admin to carry out the class transfer process if this happens. After completing all the data, the user can press the "Register" menu. Then, the user will go directly to the home page.

3. Log in page

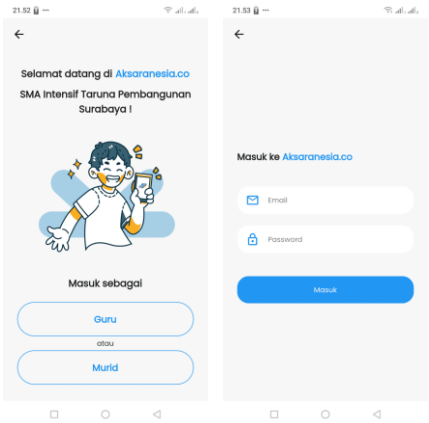


Fig. 5 Log in Page

For users who already have a registered account will enter the application by writing the email and password that has been registered in the Aksaranesia.co application. Then, the user will go directly to the home page.

4. Home Page

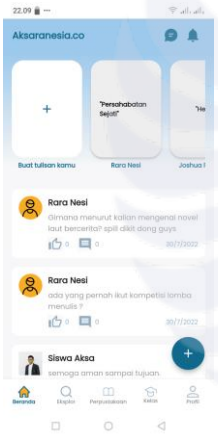


Fig. 6 Home Page

On this home page, user students can see various kinds of works from other user, including Status (short sentences) and Writing (long essays). Users can scroll down (for Status) and sideways (for Writing) to see existing works.

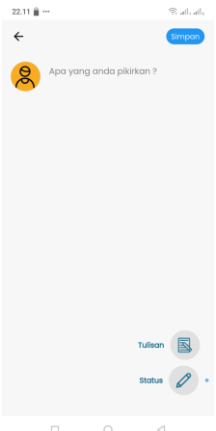


Fig. 7 Pages Create Status and Post

Meanwhile, by tapping the + button located in the lower right corner of the home page, users can take advantage of the writing feature, which is to create an extended essay, with a minimum limit of 200 words and a maximum of 500 words. This allows users to write more freely, such as short stories, poems, serials, and other works with a larger number of words. As for the status feature, it is feature that allows users to upload short sentences of a maximum of 150 letters. This feature can be used to provide book recommendations, provide brief reviews of books that have been read, write quotes, and so on. After the Status or Post has been typed, the user can press the blue Save button in the upper right corner of the page so that his work can be uploaded to the Aksaranesia.co application and be seen by other users.

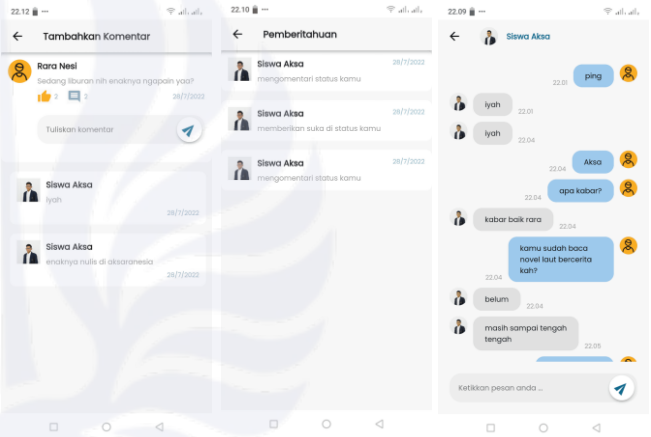


Fig. 8 Views Likes and Comments, Notifications, Private Messages

Users can still interact with each other by giving Likes and Comments on the Status they have viewed. The account notification will include any status marked with a Like or Comment. Users only need to press the bell icon to find out who has given their status to their status. This feature allows a form of interaction between users to respond to each other in the form of Likes. In Aksaraneisa.co application, users can also send private messages (personal chat) allowing more private discussions. This feature can be used to share various things such as favorite books or other information without being noticed by other users.

5. Explore Page

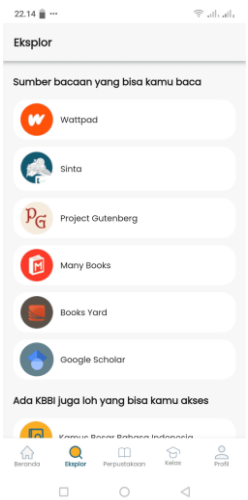


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Fig. 9 Pages Explore

This feature lets users access digital literature compilations from 6 trusted sites, namely Wattpad, Sinta, Project Gutenberg, Many Books, Books Yard, and Google Scholar. This digital literature has a wide variety, because it is not only in Indonesian but several sources provide English-based literature. On this page, the Big Indonesian Dictionary (KBBI) feature is provided to assist users in defining various kinds of words.

6. Library Page

Fig. 10 Library Pages

This page is a digital library with various kinds of literature that can be accessed directly through a pdf reader in Aksaranesia.co. The number of digital literature provided is 200, originating from the digital collection of the Ministry of Education and Culture, so that it is credible and does not violate rights. To access it, users only need to press the book they like, or use the search field by typing the title of the book you want to read.

7. Class Page

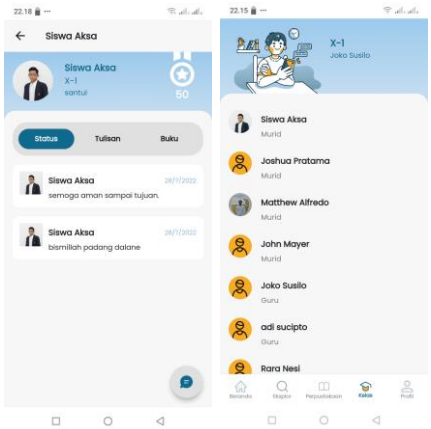

Fig. 11 Class Page

On this page, users can see a list of names of friends in one class and teachers in that class. Especially for the account, teachers can see the points earned by all students registered in the class, making it easier to check literacy activity in the application. Users can also view other users' profiles by tapping on one of the names. The profile displayed includes photo, name, class, bio, points earned, Status written, Posts made, and book history that has been read.

8. Profile Page

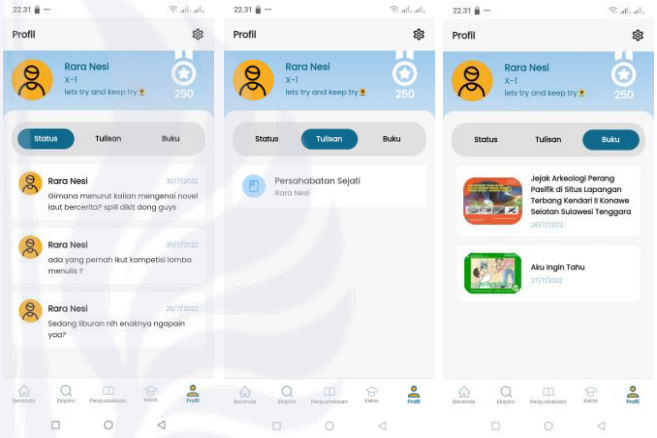

Fig. 12 Profile Page

On the profile page, users can see their account personal information in the form of photos, names, classes, bio, points earned, Status written, Posts made, and book history that has been completed.

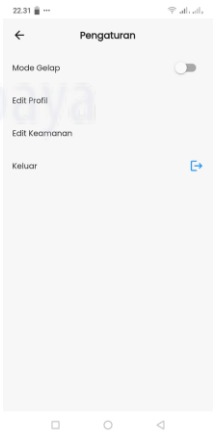

Fig. 13 Settings

In addition, users can also set several things about their account, including dark/light mode, editing the bio, editing profile photos, editing account security or passwords, and logging out of the account by pressing the settings icon in the upper right corner.

D. Test

The testing phase is carried out using interface testing to respondents after a new interface design is made at the prototype stage. This stage is carried out by testing the prototype to determine the effectiveness of the application to improve GLS at SMA ITP. The test results can be seen in Table 4.

Table 4. Test Results

No	Indicator	*Pre*	*Post*
Aspects of Reading Needs			
1	The desire to find information from non-subject books	81,2%	93,8%
2	The activity of borrowing non-subject literature	53,9%	85,9%
Aspects of Feeling Pleasure in Reading			
3	Reading and writing as a form of entertainment	75%	89,9%
4	Using free time to read	64,9%	86%
Follow-up Aspects			
5	Telling a reading to others	67,2%	85,9%
6	Writing new story from reading that has been read	50,8%	80,5%
Aspects of Awareness of the Benefits of Literacy			
7	Understand the essence of the literature read	78,1%	91,4%
8	Understand if literacy can increase insight	92,9%	97,7%
9	Understand if literacy can improve vocabulary	76%	94,6%
Aspects of the School Environment			
10	The school created a literacy program	76,6%	91,5%
11	Schools have media for literacy activities	88,3%	91,4%
12	There is a slogan for literacy activities	78,9%	91,4%
Aspects of How to Teach Teachers			
13	Teachers provide motivation	86%	95,3%
14	The teacher ordered the reading and writing activity	82%	93,8%
Information Access Aspects			
15	Availability of reading in the form of non-subject books	81,2%	94,5%
16	Variety of reading materials	79,7%	97,7%
17	Ease of access to reading materials	83,6%	96,1%
Technology Aspect			
18	Using the internet to find reading	91,4%	97,7%
Average		91,4%	97,7%

Table 4 shows the first aspect: the need for reading increased by 22.3% because the Aksaranesia.co application allows students to borrow and read non-subject literature through the Explore and Library features, making it easier for students to find the information they want to obtain. In the second aspect, reading enjoyment increases by 18% because the Aksaranesia.co application makes students perceive reading and writing as a form of entertainment in their free time, meaning that GLS is carried out as a fun activity. The third aspect, namely follow-up, increased by 24.2% because the Aksaranesia.co application allows students to write new stories through the Status and Writing features, summarize what they have read, and share readings with others. The fourth aspect, namely awareness of the benefits of literacy, increased by 12.2% because the Aksaranesia.co application made students better understand the essence of the literature they read, and made students understand that literacy can increase insight and vocabulary. The fifth aspect, namely the school environment, increased by 10.2% because SMA ITP Surabaya already has special media for literacy, namely the Aksaranesia.co application which is implemented through the integrative GLS program. The sixth aspect, namely the teacher's teaching method increased by 10.5% because through the integrative GLS program teachers can provide motivation so that students are literate. The seventh aspect, namely access to information, increased by 14.6% because the Aksaranesia.co application provides varied reading materials and can be accessed easily through each device. The eighth aspect, namely technology, increased 6.3% because Aksaranesia.co made students use the internet to search for readings. So, based on the average of the eight aspects, it was found that the percentage of interest in reading was 15%. Thus, the Aksaranesia.co application effectively increases reading interest in SMA ITP Surabaya students.

This finding is consistent with [12] research, where increasing students' interest in reading requires the involvement of various parties, namely teachers as motivators, schools as facilities providers and as parties who provide literacy policies, and most importantly awareness in students. A stimulus is needed so that the awareness of students has increased. The Aksaranesia.co application is a stimulus given to students to interpret literacy as an activity that is interesting, fun, and close to technology. In addition, [13], [14] state that optimizing students' reading interest requires digital technology, one of which is electronic books, to obtain a more practical and efficient method. The Aksaranesia.co application can accommodate this need through digital literature so that students can be literate without the constraints of the lack of availability of reading material.

IV. CONCLUSION

UI/UX design of Aksaranesia.co applications has been carried out with a design thinking approach to improve GLS at SMA ITP. Some of the views that have been designed include the design system, onboarding screen, sign-up page, log-in page, dashboard page, interactive features, explore page, library page, class page, and profile page. Aksaranesia.co, an effective application to improve GLS in SMA ITP based on the testing results. Therefore, this application can be used as one of the efforts to improve GLS in other high schools.

However, the limitation of this research is that the problem-finding process is only limited to primary data collection, so there need to be other efforts such as researching existing applications to get a broader view of the problems and user needs later. In addition, it is necessary to disseminate the application to expand the range of users.

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