

## Design and Construction Application Electronic Learning of Sumbawa Language

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**Abstract** - Preservation of Sumbawa Regional Language (Basa Samawa) through E-Learning Platform in Learning Innovation for Teenagers is an application that has been successfully created using the Rapid Application Development (RAD) software development method which includes the requirement planning phase, use design phase, construction phase, and cutover phase. The design model used in developing the application is the Data Flow Diagram (DFD). This application can be optimized for use by the Sumbawa Regency Education and Culture Office (DIKBUD), teachers, and students in the Sumbawa Regency area. The use of the application can be maximized by teenagers to learn the Sumbawa language according to the learning model available in the application. The learning models include batuter (storytelling), maca ke nulis (reading and writing), aksara, lawas (poetry), balawas (rhyming), basakeco (developing poetry), speeches and writing short stories in Samawa or Sumbawa language. All Sumbawa language materials are available in the application which is also equipped with learning videos. To be able to access the material presented, users must first register and then be able to take part in learning, quizzes and post-tests. After the testing process was carried out on the application using black box testing on three actors, namely the Dikbud admin, teachers and students, it was stated that all application functionality in the twelve tables could function properly.

**Keywords:** *Design, E-Learning, RAD, Sumbawa Language*

### 1. INTRODUCTION

Regional languages in Indonesia that have been identified and validated by the Language and Book Development Agency, Ministry of Education and Culture, number 718 languages from 2,560 observation areas. [1]. Language is the easiest medium to understand social conditions and is a culture that is created and used as a means of communication [2]. Culture will position regional languages as the wealth and legacy of human creativity, feelings and desires of the past, which must be preserved and correlated with the nature of culture. Of course, regional languages are included in a dynamic culture, which means they will experience language deconstruction or reconstruction [3]. Linguistic diversity in Indonesia is not just the number of languages it has, but reflects the diversity of cultures and traditions that are passed down from generation to generation [4]. The diversity of regional languages is something to be proud of, but on the other hand concerns are starting to emerge because most of them are in critical condition. The extinction of a language in one or two generations may occur due to factors outside the language that encourage this to happen, such as the development of the Indonesian language, which is a factor that can reduce the frequency of use of regional languages [5].

In terms of quantity, the number of regional language speakers in Indonesia is quite different, where there are regional languages that still survive with a relatively large number of speakers, but there are also regional languages that only have a small number of speakers or what are usually referred to as minority languages [6]. The loyalty of regional language speakers to their language has decreased, especially in the family sphere [7]. A large number of languages are now moving towards extinction due to the small number of speakers and parents who no longer make it a habit to use their mother tongue at home [8]. This is in line with the development of the times and various influences, both the influence of science and technology and socio-culture, there have been changes in the use of language [9]. Another fact that shows the crisis situation of regional languages is the decreasing daily use of regional languages and the fact that regional languages have failed to respond to the need for global communication, which is marked by the entry of technological languages [10].

Reviewing one of the regional languages in Indonesia, namely Sumbawa Language or Basa Samawa which is rich in dialects and vocabulary. Sumbawa language, Sumbawa Besar dialect spoken by the Sumbawa tribe is

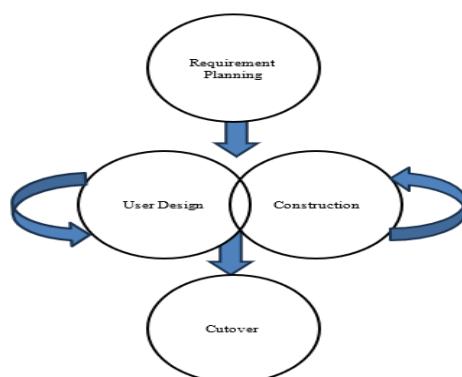
one of the dialects with the widest distribution area which is in line with the history of the Sumbawa Sultanate with the territory covering the entire West Sumbawa Regency to the border of Sumbawa Besar Regency and Dompu Regency [11]. The number of Sumbawa language speakers was around 300,000 people in 1989 and has continued to decline until now. Based on the results of dialectometric calculations, Sumbawa language is a language that has a percentage of differences ranging from 81-100% when compared to the surrounding languages, such as Bima and Sasak [12]. The concern is based on the phenomenon that is developing in the field that the Sumbawa language is increasingly being abandoned. The position of the Sumbawa language as a mother tongue has been replaced by Indonesian, the use of which has also decreased both in quantity and quality.

The phenomenon of the decreasing interest of the younger generation in regional culture to learn and apply regional languages is increasingly diminishing, especially in learning regional languages and scripts [13]. This is a challenge and difficulty that is often faced by teachers, both in terms of the material contained in the module which is still minimal so that teachers have to look for additional material from various other references as well as challenges in terms of time and media [14]. Similarly, teachers in Sumbawa Regency have difficulty in delivering local cultural subject matter as local content to high school students. Language learning in its process certainly carries out effective, innovative, active, creative and enjoyable learning innovations [15]. The challenges in teaching Sumbawa language and script are increasingly complex due to the cultural heterogeneity of students and the lack of environmental support, so adaptive and creative learning strategies are needed to increase students' interest in learning. The development of a responsive web-based Sumbawa language learning application on smartphones is part of the solution to these problems.

Technology that supports activities in the field of education can be implemented in the form of distance learning, better known as e-learning [16]. Effective learning can be said to be learning that optimally utilizes information and communication technology in the learning process [17]. The application is designed with aspects that are adjusted to the habits of students who are accustomed to using gadgets. Learning in schools tends to emphasize memorization aspects alone, so by using e-learning emphasizes repetition of the material to provide a new and interesting learning experience [18]. Utilizing e-learning as a learning medium for Sumbawa language is expected to attract the interest of teenagers to learn the regional language. Various learning models for Samawa language and literature that can be learned are batuter (storytelling), maca ke nulis (reading and writing), aksara, lawas (poetry), balawas (rhyming), basakeco (developing poetry), speech, and writing short stories in Samawa or Sumbawa language.

## 2. RESEARCH METHODOLOGY

This study focuses on the creation of an e-learning application for preserving the Sumbawa regional language as a learning innovation media for teenagers. The stages of creating e-learning use the Rapid Application Development (RAD) framework starting from the requirement planning phase, user design phase, construction phase, and cutover/ completion phase [19]. The process carried out using the RAD framework can be seen in Figure 1.



**Figure 1.** Stage of RAD Method [20]

The process of the stages carried out using RAD software development is explained as follows:

### Requirement Planning Phase

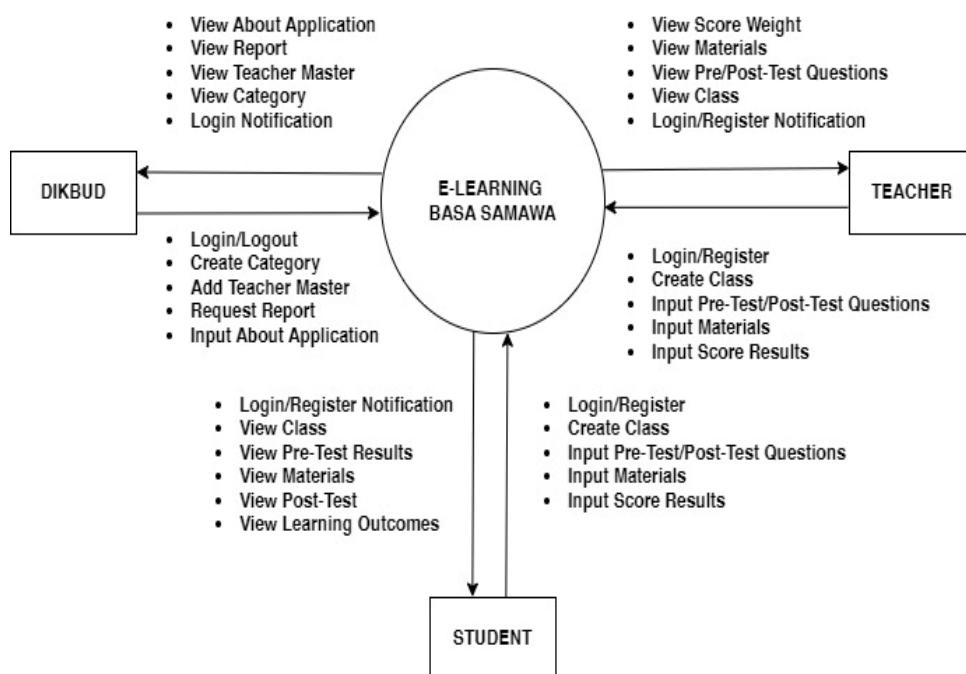
The requirements planning phase process is a planning stage related to identifying the steps and needs related to efforts to preserve the Sumbawa language. The activity was carried out through a Focus Group Discussion (FGD) process involving cultural activists, local content workers in schools and information technology practitioners. The Master Teacher Certificate for Regional Language Revitalization for Mother Tongue Shoots from the West Nusa Tenggara Provincial Language Office is a requirement that must be possessed by the master teacher resource person. The FGD was carried out in eight meetings, namely the first meeting with the theme of Regional Language Protection Policy and the second meeting discussed Efforts to Protect Regional Languages and Literature. The third FGD activity was themed Sakeco Learning Practices and Presentation of the e-learning Concept, and the fourth FGD discussed Sumbawa Language Speech Practices and Presentation of the e-learning Concept. Meanwhile, the fifth FGD discussed Belawas Learning Practices and Explanation of the e-learning Concept and Batuter Learning Practices and Explanation of the e-learning Concept were the themes of the sixth FGD. Meanwhile, the seventh FGD discussed Sumbawa Short Story and Poetry Learning Practices and the Explanation of the existing e-learning concept. The eighth FGD process, which was the last FGD, discussed Sumbawa Script Learning Practices and the Explanation of the existing e-learning concept.

### Use Design Phase

At this stage, the e-learning application design is carried out using structured design to facilitate the application design. Utilization of context diagrams, data flow diagrams, entity relationship diagrams and database structure designs and display designs that produce designs for the coding process.

#### 2.1. Context Diagram

Context diagram is a diagram consisting of a process and describes the scope of a system and the highest level of DFD that describes all input to the system or output from the system. The context diagram contains a general description of the system being developed which contains who provides data to the system and to whom the information that the system must produce [21].



**Figure 2.** Samawa Language e-Learning Context Diagram

## 2.2. Data Flow Diagram (DFD)

Data Flow Diagram is a graphical representation of a system that describes the components of a system, the data flows between these components, the origin, destination and storage of the data. [22]. Data Flow diagram in the e-learning system as follows:

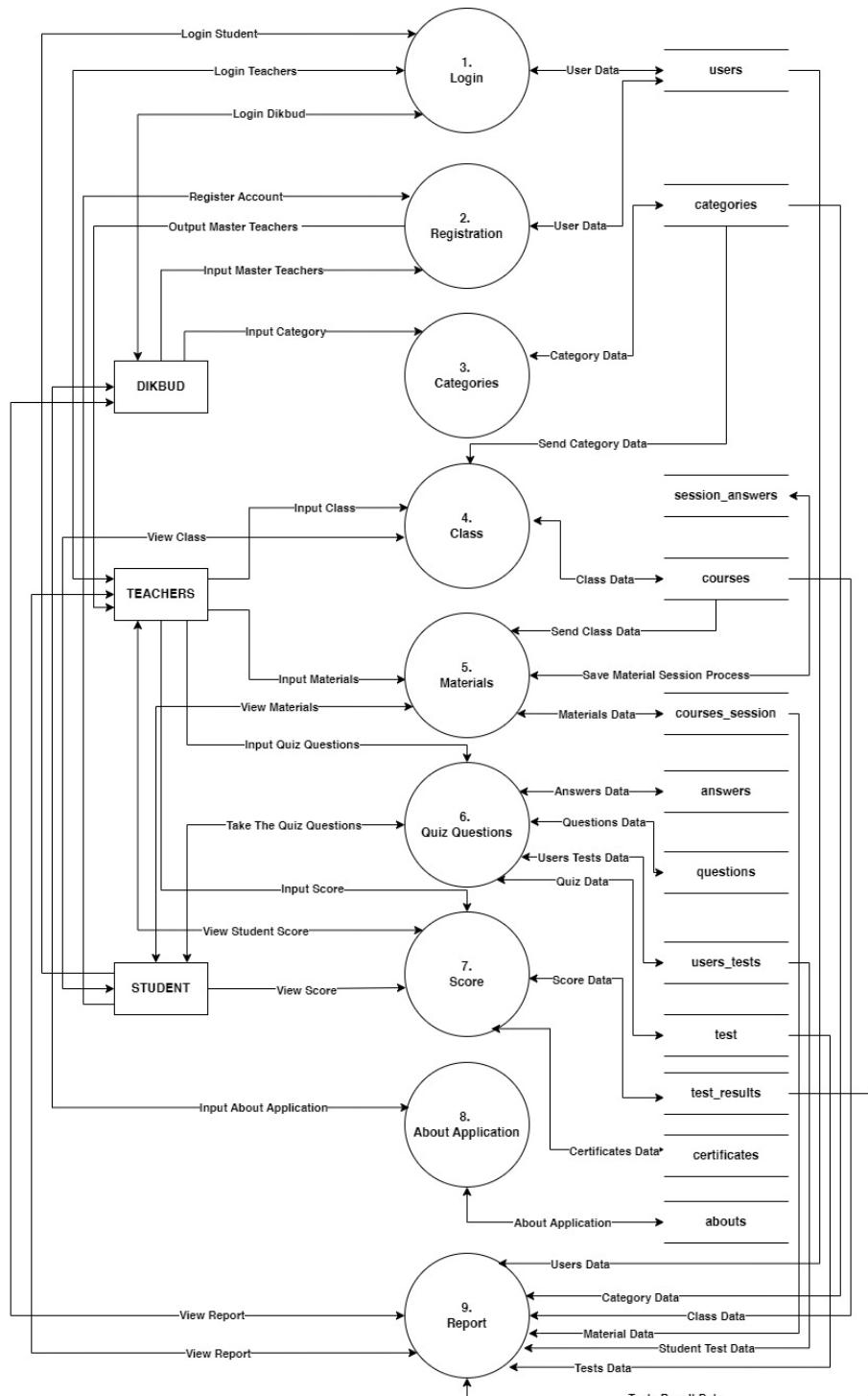
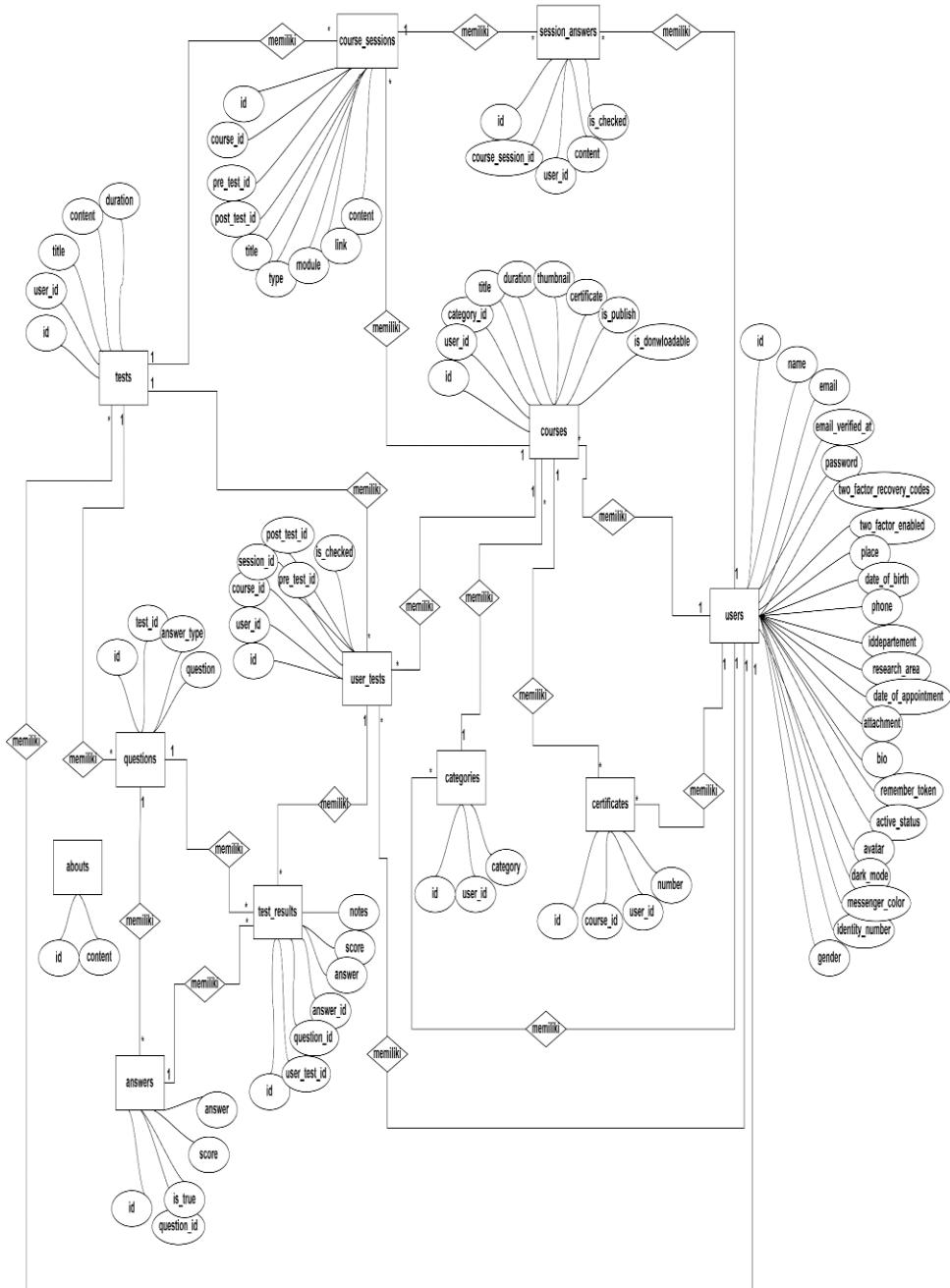


Figure 3. Data Flow Diagram Level 0

### 2.3. Entity Relationship Diagram (ERD)

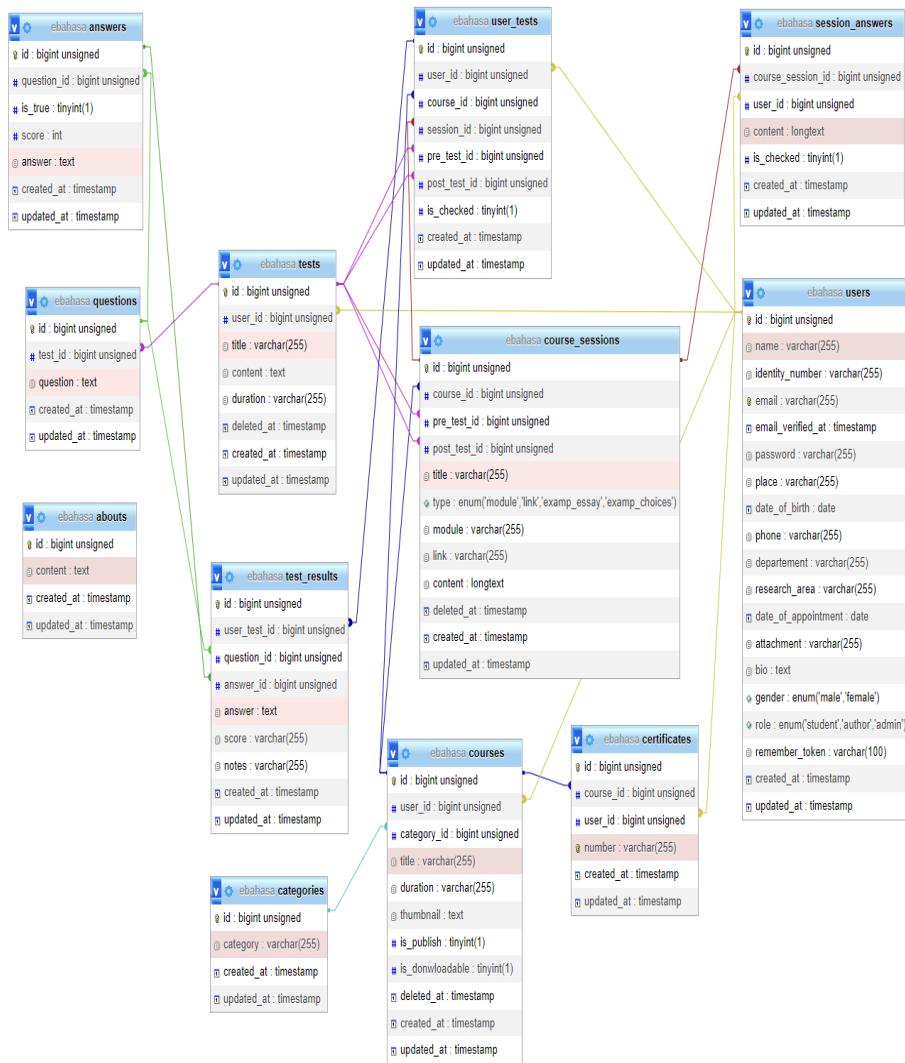
The basic technique used to create databases and ERDs is one of the most widely used database design techniques [23]. ERD in e-learning Samawa language contains twelve entities, namely about, answers, categories, certificates, course, course\_session, question, session\_answer, test, test-result, user and user\_tests. The following is an ERD image of the system:



**Figure 4.** Entity Relationship Diagram of e-Learning Basa Samawa

### Construction Phase

This stage is the coding stage of the Basa Samawa e-learning application where the application is built web-based using the Flutter Framework and PHP programming language. The following is a display of the MySQL database.



**Figure 5.** Database View in MySQL

### Cutover Phase

The final stage of RAD software development is the completion phase. The fourth stage of the RAD process includes the application testing process [24]. At this stage, the testing process is carried out or by informatics alumni. The e-learning application testing includes the dikbud admin account, teacher account and student account. In software testing, validation is one of the processes of checking or checking the software according to the specifications and objectives expected [25]. The testing model used is black box testing, system testing on the outside of the software such as interface design and functionality [26].

## 3. RESULT AND DISCUSSION

The results of preserving the Sumbawa regional language through the use of e-learning in learning innovation for teenagers. Users of Sumbawa language e-learning consist of the admin of the Sumbawa Regency Education and Culture Office (DIKBUD), Sumbawa regional language revitalization master teachers, and students. Access to the e-learning application can be reached via the link <http://e-bahasasamawa.id/> [27]. The application usage display is as follows:

### 3.1. Admin of the Department of Education and Culture (DIKBUD) of Sumbawa Regency

The application user, namely the DIKBUD admin, can access six application views including the admin login page, admin dashboard page, category page, user page, add user page and about application page. The following is a view of the six pages.

### 3.1.1. Login Page and Dashboard Page View

Figure 6 displays the login menu with the initial display that must be passed by the admin by entering email and password. While Figure 7 displays the admin dashboard page. The dashboard page is the first page when the admin successfully logs into the system and sees information related to reports, average class scores, passing data, pre-exam and post-exam percentages, user age, number of users per month, gender and user type.

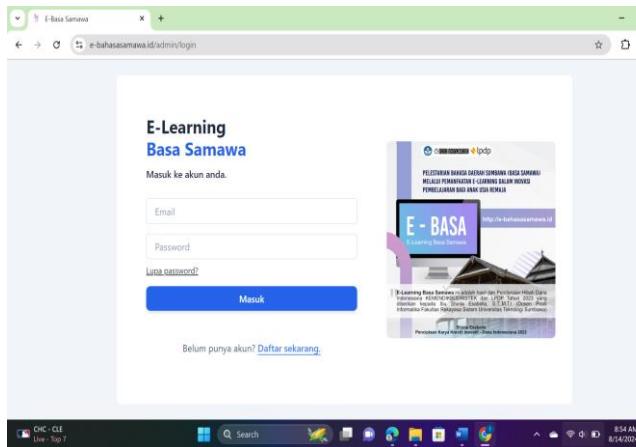


Figure 6. Admin Login Page View

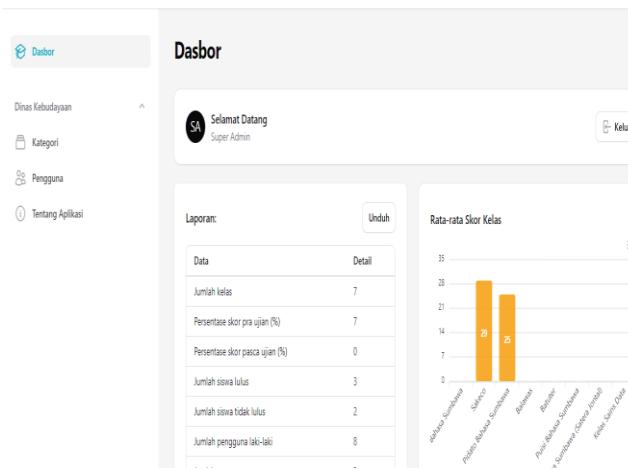


Figure 7. Admin Dashboard Page View

### 3.1.2. Category and User Page Views

In the Category Page display image, this page functions to view various available class categories and can also add the required class categories. There is a change menu to edit existing data and there is also a delete menu. While in the User Page display image, this page displays user data that uses E-Learning Basa Samawa. Starting from Admin, Teacher and Student data. On this page, the Admin can also add user data. On this menu there is also edit and delete.

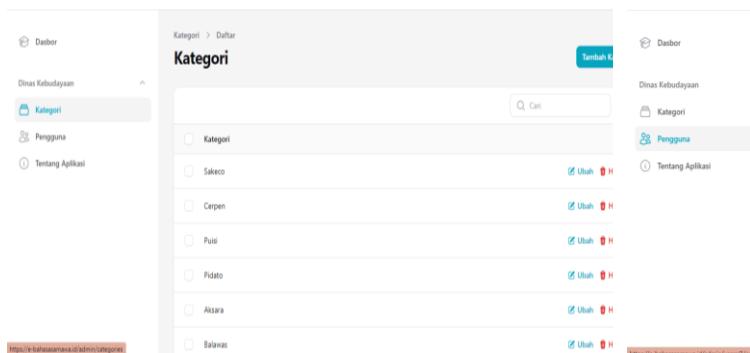


Figure 8. Category Page View

Pengguna > Daftar			
Pengguna			
<input type="checkbox"/> Nama	Email	Role	<a href="#">Lihat file</a> <a href="#">Ubah</a> <a href="#">H</a>
<input type="checkbox"/> Super Admin	admin@gmail.com	Admin	<a href="#">Lihat file</a> <a href="#">Ubah</a> <a href="#">H</a>
<input type="checkbox"/> Mufti Jauhari, S.Pd, S.Sd	kgisabukar14@gmail.com	Guru	<a href="#">Lihat file</a> <a href="#">Ubah</a> <a href="#">H</a>
<input type="checkbox"/> Arifhanto, S.Si	arifhanto@gmail.com	Guru	<a href="#">Lihat file</a> <a href="#">Ubah</a> <a href="#">H</a>
<input type="checkbox"/> Sulastri, S.Pd, M.M,Inov	sulastri573@ganu.sma.id	Guru	<a href="#">Lihat file</a> <a href="#">Ubah</a> <a href="#">H</a>
<input type="checkbox"/> Aenun Jariah, S.Pd	aenunjariah05@gmail.com	Guru	<a href="#">Lihat file</a> <a href="#">Ubah</a> <a href="#">H</a>
<input type="checkbox"/> Rosidah, S.Pd, M.M,Inov	rosyadrosidah@gmail.com	Guru	<a href="#">Lihat file</a> <a href="#">Ubah</a> <a href="#">H</a>

Figure 9. User Page View

### 3.1.3. Add User and About App Page Views

In the Add User Page display image, Admin can add the required user data. The data inputted is full name, telephone number, NIK/NISN, email, password, password confirmation, place of birth, date of birth, gender, institution/agency/school of origin, field of science/major/expertise, date of appointment, role, attachment of professor/expertise certificate and bibliography. Meanwhile, the About Application Page display image explains the description of E-Learning Basa Samawa and there is an edit and delete menu.

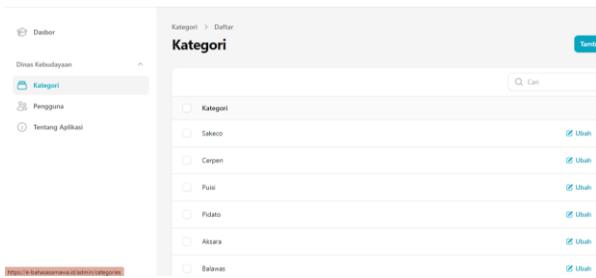


Figure 10. Add User Page View

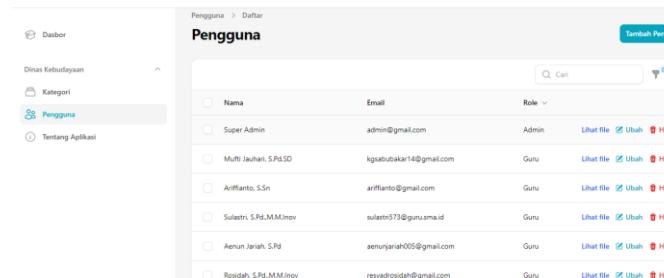


Figure 11. About Application Page View

## 3.2. Master Teacher of Sumbawa Regional Language Revitalization

The application users, namely the Sumbawa regional language revitalization master teachers, can access ten application views including the teacher login page, teacher dashboard page, class page, add class page, material, add material page, quiz page, add quiz page, learning result page, and view learning result details page. The following is a view of the six pages.

### 3.2.1. Teacher Login Page and Teacher Dashboard

On the teacher login page display, to be able to enter the system, teachers must enter their email and password. Meanwhile, on the Teacher Dashboard Page display image, it displays the average student score data, pass data, and percentage data for exams and post-exams.

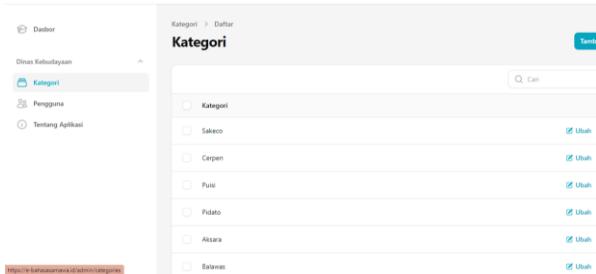


Figure 12. Add User Page View

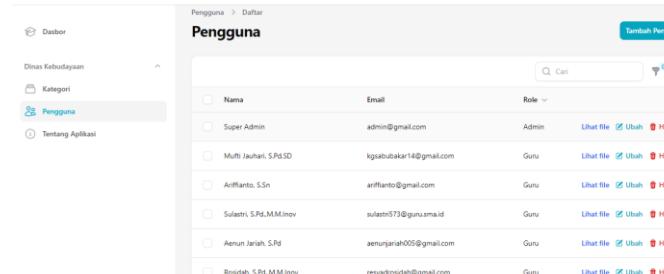


Figure 13. About Application Page View

### 3.2.2. Class Usage Page and Add Class Page

In the Class Page display image, it is a page that displays data on the number of classes, the total number of graduates, the total number of failures and also contains data on class names, categories, number of materials and thumbnails. On this page, teachers can add classes and can also change, delete or view class details. Meanwhile, permission to download certificates. Meanwhile, in the Class Page display image, it is a page that displays data on the number of classes, the total number of graduates, the total number of failures and also contains data on class names, categories, number of materials and thumbnails. On this page, teachers can add classes and can also change, delete or view class details.

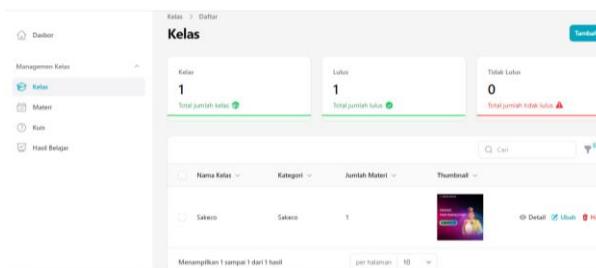


Figure 14. Class Page View

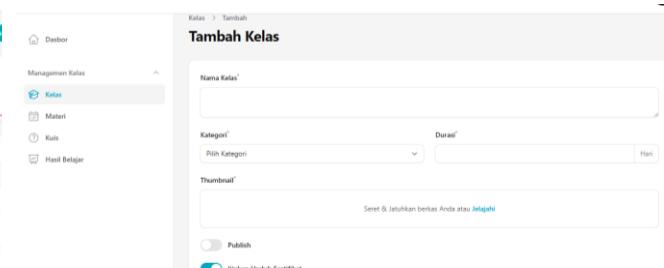


Figure 15. Add Class Page View

### 3.2.3. Materials Page and Add Materials

In the display image, the Material Page contains the materials available in the class. This page displays the class name, materials, and class sessions. There is a change and delete menu to change or delete available materials, in addition there is a menu to add the required materials. In the display image of the Add Class Page, there are several things that must be filled in by the teacher to add new materials, namely select class, session name/material, pre-exam, post-exam, type of session/material.

The screenshot shows a list of materials for a class named 'Sakico'. The list includes 'Pengantar' and 'Modul'. There are buttons for 'Ubah' (Change) and 'Hapus' (Delete). The page has a search bar and a pagination control 'per halaman 10'.

Figure 16. Material Page View

The screenshot shows a form for adding a new material. It requires selecting a class ('Pilih Kelas'), entering a session/material name ('Nama Sesi/Materi'), and specifying a pre-exam ('Pra Ujian') and post-exam ('Pasca Ujian'). There are dropdown menus for 'Pilih salah satu opsi' and 'Jenis Sesi/Materi'. At the bottom are buttons for 'Simpan', 'Simpan dan tambah', and 'Batal'.

Figure 17. Add Material Page View

### 3.2.4. Quiz Page and Add Quiz Page

In the image of the Quiz Page display, it displays a page containing the quiz name, duration, number of questions and there is a change and delete menu to edit or delete the quiz. There is an add quiz menu to add the required quiz. Meanwhile, on the Add Quiz Page display. On this page, teachers can add the required quizzes by filling in some data starting from the quiz name, duration and quiz details.

The screenshot shows a list of quizzes for a class named 'Pre Test Sakico'. It includes a duration of '1 Jam 0 Menit' and a question count of '20'. There are buttons for 'Ubah' and 'Hapus'. The page has a search bar and a pagination control 'per halaman 10'.

Figure 18. Quiz Page View

The screenshot shows a form for adding a new quiz. It requires entering a quiz name ('Nama Kuis'), specifying a duration ('Durasi'), and filling in a 'Detail' section with a rich text editor. At the bottom are buttons for 'Simpan', 'Simpan dan tambah', and 'Batal'.

Figure 19. Add Quiz Page View

### 3.2.5. Learning Outcome Page and Learning Outcome Details

In the image of the Learning Results Page display, it displays the title and total users. On this page there is a view menu to see details of learning results. In the image of the View Page display, it is a page to see details of student learning results. On this page teachers can see a list of students who take classes, student scores, check test results and can download certificates, to download certificates students must get a score of more than 75.

Title	Total User
Sakeco	1

Menampilkan 1 sampai 1 dari 1 hasil

Figure 20. Learning Results Page View

#	Nama	Status Dikerjakan	Status Diperiksa	Skor	Action
Pra Ujian	Pre Test Sakeco	✓	✓	29	Periksa →

Total Skor 29  
Grade E

Figure 21. Learning Outcome Detail Page View

### 3.3. Students

Student application users can access sixteen features in the Sumbawa language e-learning application, the display of which can be seen as follows:

#### 3.3.1. Student Home Page and User List

In the image of the Home Page display which is the initial display when the user has typed E-Learning bahasasamawa.id in the search column and is immediately directed to the home menu on E-Learning Basa Samawa. In the image of the User Registration Page display, users who are using E-Learning Basa Samawa for the first time must register by clicking the "register" menu in the upper right corner of the home page. Then fill in the existing data, namely name, NIK/NISN, school/agency origin, class/major/expertise, date of birth, email, password and password confirmation then click register.

Figure 22. Student Home Page View

Figure 23. User List Page View

#### 3.3.2. User Login Page and Home

In the image of the Login Page display, the user has completed the registration process, then can log in by clicking the "login" menu in the upper right corner of the homepage. To be able to log in, the user must enter the email and password used to register previously. In the image of the User Home Page display, after the user logs in, they will be directed to the homepage of their respective accounts. On the homepage there is a class menu, my class, and about the application.



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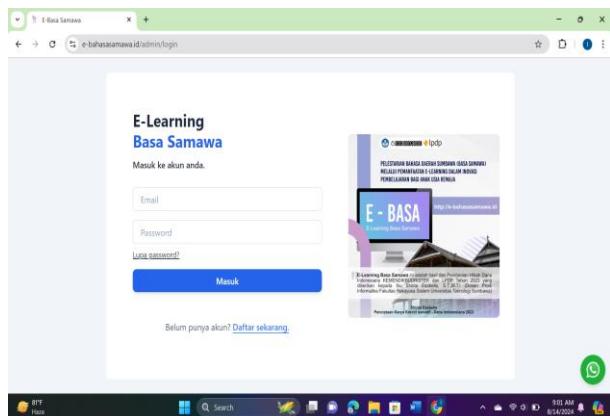


Figure 24. Student Home Page View

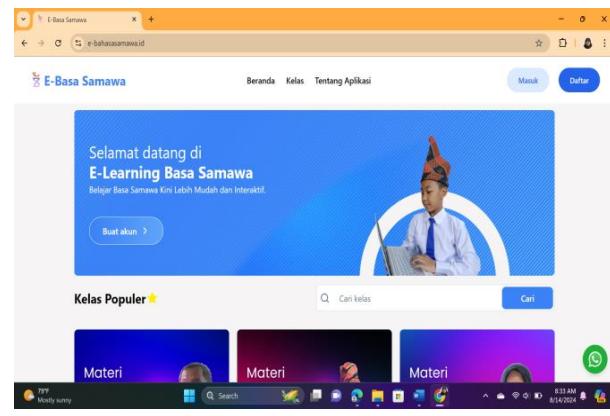


Figure 25. User List Page View

### 3.3.3. Class Page and Start Learning Page

In the display image of the Class Page, there is a collection of classes available on E-Learning Basa Samawa. Users can select the desired class and start taking the available class by clicking "start learning" to start the class. In the display image of the Start Learning Page, users will be redirected to the display to start working on the pre-exam.

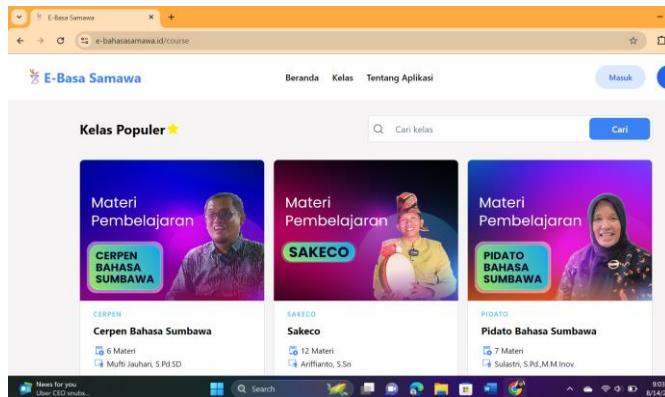


Figure 26. Class Page View

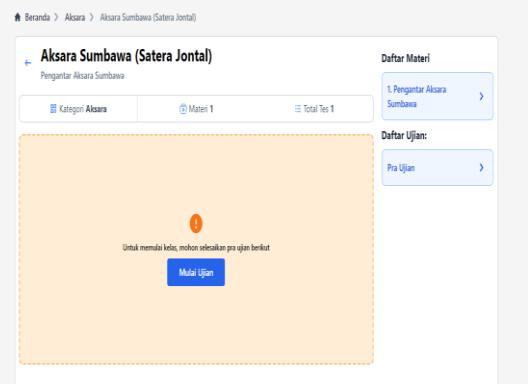


Figure 27. Start learning page view

### 3.3.4. Pre-Exam and Pre-Exam Evaluation Pages

In the Pre-Exam Page display image, users will be directed to work on 20 pre-exam questions within 1 hour of work. Meanwhile, in the Pre-Exam Evaluation Page display image, users who have finished working on the pre-exam will see their exam scores.

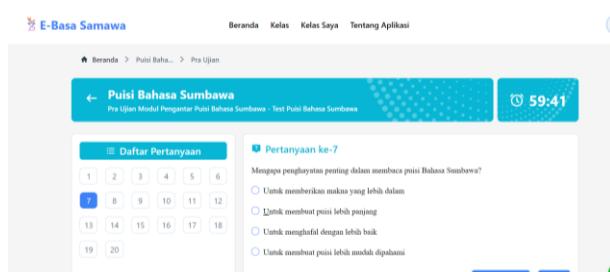


Figure 28. Pre-Exam Page View



Figure 29. Pre-Exam Evaluation Page View

### 3.3.5. Material Page and Post Test Page

In the Material Page display image, it is a page for studying selected class material. Class material can be studied when the user has completed the previous pre-test. Users can download certificates when they get a pre-test score above 75. After the learning is complete, students are required to take a post-test as shown in the image above. The exam with the same questions but presented randomly so that it can test students' abilities after studying in E-Learning. In the Post Test/Exam Page display image, users will be directed to work on 20 questions within 1 hour of work.

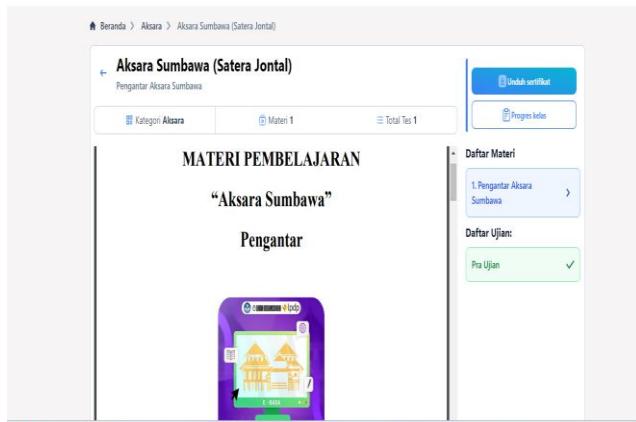


Figure 30. Material Page View

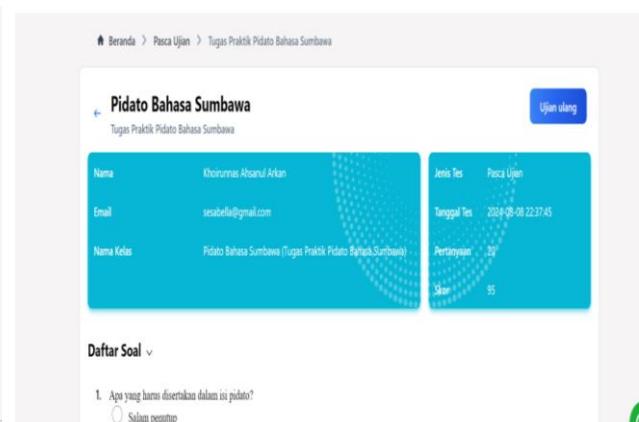


Figure 31. Post Test/Exam Page View

### 3.3.6. Post Test/Exam Evaluation and Class Progress Page

In the Post Test/Exam Evaluation Page display image, users who have completed the exam will see their exam scores. In the Class Progress Page display image, users can see details of the values obtained starting from the scores and grades achieved. Then there is a detail button that will direct users to the learning materials.

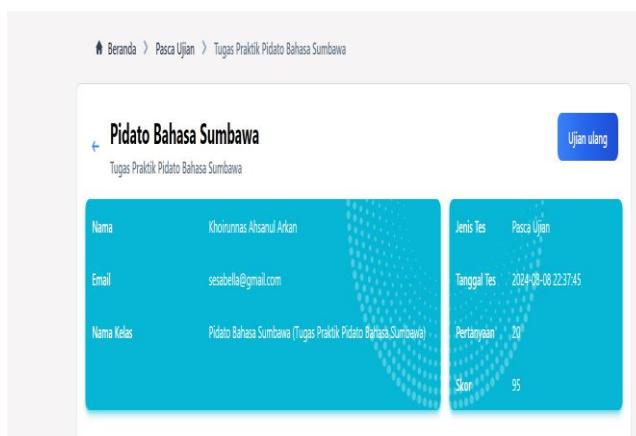


Figure 32. Post-Test/Exam Evaluation Page View

Kinerja Pelajar					
#	Nama	Status Dikerjakan	Status Diperiksa	Skor	Action
Sesi/Materi	Modul Pengantar Pidato Bahasa Sumbawa				<a href="#">Detail</a>
Pra Ujian	Pre Test Pidato Bahasa Sumbawa	<span style="color: green;">✓</span>	<span style="color: green;">✓</span>	95	
Seси/Materi	Modul Cara Pidato Bahasa Sumbawa				<a href="#">Detail</a>
Sesi/Materi	Modul Contoh Pidato Bahasa Sumbawa				<a href="#">Detail</a>
Sesi/Materi	Tugas Praktik Pidato Bahasa Sumbawa				<a href="#">Detail</a>
Tugas	Tugas Isian	<span style="color: green;">✓</span>	<span style="color: green;">✓</span>	86	
Pasca Ujian	Pre Test Pidato Bahasa Sumbawa	<span style="color: green;">✓</span>	<span style="color: green;">✓</span>	95	
Total Skor					92

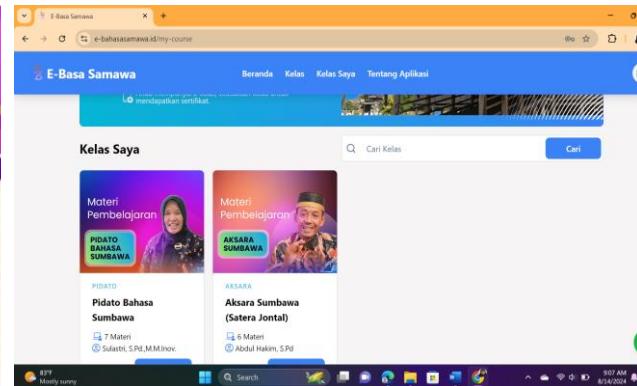
Figure 33. Class Progress Page View

### 3.3.7. Print Certificate of Learning Results Page and My Class Page

In the display image of the Learning Result Certificate Printing display, you can see the student's learning outcomes that have been implemented in E-Learning Basa Samawa. In the display image of My Class Page, it displays what classes the user has taken in E-Learning Basa Samawa. Users can access these classes by clicking "start learning" and will be directed to the material for each class.



**Figure 34.** Display of the Learning Outcome Certificate Print Page



**Figure 35.** My Class Page View

### 3.4. Application Testing

The testing of the Samawa Language e-learning application was carried out using black box testing which is used to test the functionality of the application that has been developed. The following are details of the testing of the Samawa Language e-learning application for Student account testing is carried out in 3 testing categories, namely on the student registration form, student login, and class selection menu.

**Table 1.** Student Registration Form Testing

No	Test Scenario	Test results	Note
1	Add Student Data	Can Add	OK

**Table 2.** Student Login Form Testing

No	Test Scenario	Test results	Note
1	Username and Password are not filled in then press login	There is a message that you must fill in your user name and password.	OK
2	Fill in the username and leave the password blank, then press login.	There is a message that you must enter a password	OK
3	Username and password are filled with an account not registered on the server	There is already a message that you must fill in the registered user.	OK
4	Username and password are filled with the account registered on the server.	Can log in to admin dashboard	OK

**Table 3.** Class Select Test

No	Test Scenario	Test results	Note
1	Select the Add Class Menu	Can Add	OK
2	Select the View Class Menu	Can view	OK
3	Select the Study Material Menu	Can learn	OK
4	Select the Test Menu	Can take the exam	OK
5	Select the Learning Progress Menu	Can view progress	OK
6	Select the Print Certificate Menu	Can print certificates	OK
7	Select Menu View About Application	Can view	OK

## 4. CONCLUSION

Preservation of the Sumbawa Regional Language (Basa Samawa) through the E-Learning Platform in Learning Innovation for Teenagers is an application that has been successfully created using the Rapid Application Development (RAD) software development method and using Data Flow Diagrams (DFD) as a design model. This application can be optimized for use by the Sumbawa Regency Education and Culture Office (DIKBUD),

teachers, and students in the Sumbawa Regency area. The use of the application can be maximized by teenagers to learn the Sumbawa language according to the learning model available in the application. The learning models include batuter (storytelling), maca ke nulis (reading and writing), aksara, lawas (poetry), balawas (rhyming), basakeco (developing poetry), speeches and writing short stories in Samawa or Sumbawa language. All Sumbawa language materials are available in the application which is also equipped with learning videos. To be able to access the material presented, users must first register and then be able to follow the learning, quizzes and post-tests. After the testing process on the application using black box testing on three actors, namely the dikbud admin, teachers and students, it was stated that all application functionality in the twelve tables could function properly.

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