IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

WEB-BASED EARLY CHILDHOOD LEARNING INFORMATION SYSTEM TO PROMOTE FUN LEARNING USING FRAMEWORK CODEIGNITER

Mariel Cristine Casas Sasubo[1] , Prihartono Aksan Halim[2] , Falaah Abdussalaam[3]
[1]Student, [2]Lecturer, [3]Lecturer
[1] Informatics Management
Politeknik Piksi Ganesha, Indonesia

Abstract

The Early Childhood Education Division manages early childhood education institutions from playgroup to kindergarten. In the field of early childhood education, data processing and storage is counterproductive, still manual, and not yet centralized in a single database, making processing, information gathering, and presentation of learning information difficult. It is As a result, designers discuss what to build, give users an overview of the new system to meet future users' needs, and make the resulting data more useful. Create a learning information system for early childhood education using the CodeIgniter framework and waterfall methodology. The purpose of this study is to determine whether the developed system can assist early childhood education staff and teachers, process and collect data, and present learning information to students at school and at home. The system can also support and encourage learning activities of early childhood education students.

Keywords: *Early Childhood Education, Information System.*

INTRODUCTION

In the current system, teachers and staff encounter numerous issues and challenges when managing learning data, starting with the creation of modules, activities, children's activities, and children's data. And aslo Preparation of data learning reports for children in order to provide information on child development to parents. When there is a doubt in the learning data staff and teachers must check and repeat each learning data one by one, which takes a long time to process learning data for preschool children.

A web-based early childhood learning information system is a digital platform designed for young children to learn and explore new subjects in a fun and interactive way. The aim of such a system is to promote and support early childhood education through the use of technology. The system can be accessed through a web browser and provides a variety of educational content and activities, including lessons, games, and interactive simulations, to engage children and encourage their learning.

In the current system, teachers and staff face many problems and challenges in managing learning data, starting with creating modules, activities, children's activities and children's data. It also creates child data learning reports to provide parents with information on their child's development. If there is any doubt about the learning data, staff and teachers have to check and repeat all the learning data one by one, which takes a long time to process the learning data of preschoolers.

A web-based early learning information system is a digital platform that enables young children to learn and explore new topics in a fun and interactive way. The purpose of such systems is to use technology to facilitate and assist early childhood education. The system can be accessed through a web browser and provides a variety of educational content and activities, including lessons, games, and interactive simulations, to engage children and encourage their learning.

This research is solely based on the observations of researchers and references from prior researchers; references from earlier research are used as references in this research as well as writing about it.Dody Sumardi, Nunuk Suryani, and Akhmad Arif Musadad conducted research with the title Website-Based Learning Management System (LMS) as a Tool for Learning in the Covid-19 Pandemic Period for Junior High Schools, As a result, teachers can now deliver teaching material electronically or in a virtual class, and students can access these subjects at any time and from any location as long as they are connected to the internet network. According to the findings of the assessment conducted by material experts, media experts, and teachers as potential users, this study was successful in developing an LMS suitable for use in the learning process.

The system typically includes a dashboard for administrators to manage the content and user accounts, and a user-friendly interface for children to access the learning materials. With a web-based system, children can learn at their own pace and on their own schedule, without the need for a traditional classroom setting. In addition, the system can provide data and insights on a child's learning progress, allowing administrators and educators to track progress and make data-driven decisions to improve the educational experience.

The researchers' solutions are based on background and references from previous studies. After searching the data and comparing the researcher's work with previous researchers, the researchers found that their previous work focused solely on storing student data and student value data. In this study, researchers extend previous work by including learning data accessible to parents and students. Of course, early childhood education requires information systems aimed at facilitating the management of learning data more effectively and efficiently. This is a web-based early childhood learning information system that uses the CodeIgniter framework to facilitate fun learning, as demonstrated in this study. Overall, a web-based early childhood learning information system is a valuable tool for promoting the joy of learning and supporting early childhood development.

METHOD

The authors used qualitative research methods in this study. Creswell claims that: Researchers construct complex and big picture, analyze words, report information in detail, and conduct research in natural settings”. Hendryadi et al. (2019:218) is a naturalistic process study that aims to gain a deeper understanding of the experience of social phenomena. To collect valuable and consistent data to facilitate and advance this research. The authors used several stages of data collection methods, including:

1. Observation

Observation and analysis subjects from the education department and several early childhood education institutions were used to perform the observations. His observations were divided into three parts:

A. Directors' satisfaction with fulfilling their responsibilities in their day-to-day operations.
B. Can you maintain self-control while playing?
C. Whether you enjoy learning new things

2. Interview

The authors interviewed early childhood students, teachers, and parents to gather reliable information.

3. Literature review

The above law applies to early childhood education in Bandung. The authors used data collection techniques in their literature survey by reading, taking notes, and researching three sources (a literature review article, observational notes, and a questionnaire).

a. Information

A set of data or statistics that are first filtered so that the information received can be quickly and easily understood and used to the benefit of the recipient. From this definition we can see that the term information does not have the same meaning as the term data. Data is raw information that can be transformed into useful information when processed. Not all data or information can be transformed into useful information for the recipient. If we receive information that is not useful to the recipient, it will not be considered relevant. The term "information" comes from the Middle French word "informacion". This means code, synopsis or inspirational information that can be presented in a variety of formats including audio, charts, videos, images, sentences and tables.

b. System

A set of elements, components, and variables that work together and depend on each other to carry out a procedure and achieve a single primary goal. If any element of the system fails, the task cannot be accomplished, what was intended to be accomplished or realized is not achieved, and problems arise. According to Abdul Kadir Sistem adalah sekumpulan elemen yang saling terhubung yang bertujuan untuk mencapai satu tujuan.

c. Web-based

Web-based applications and programs based on World Wide Web Consortium (W3C) technologies and standards that are easily accessible from a Web browser. Most web applications are built with JavaScript, Hypertext Markup Language (HTML), and Cascading Style Sheets (CSS).

SOFTWARE DEVELOPMENT

The waterfall method and the software development lifecycle (SDLC) method deal with different parts and phases beginning with planning and ending with software testing and implementation (Ragunath, Velmourogan, Davachelvan, Kaylvizhi, and Ravimohan, 2010). Too many government projects and large corporations use the waterfall model (Alshamrani & Bahattab, 2015). The five phases of the software development life cycle are requirements analysis, design, implementation, testing, and maintenance. according to the photo. Based on Figure 1.

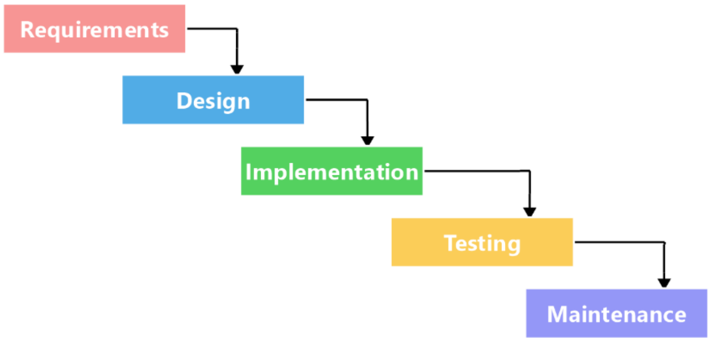

Figure 1 WaterFall Method

The following description of this research method

1. Requirements extraction and analysis - in this phase all possible requirements of the system to be developed are recorded and documented in the specification.
2. Design - In this phase the requirements specification of the first phase is reviewed and the system design is prepared. This system design specifies the hardware and system requirements and helps define the overall system architecture.
3. Implementation - With information from the system design, the system is first developed in small programs called units, which are integrated in the next stage. Each unit is developed and tested for functionality called unit testing.
4. Testing - After testing each unit, all units created during the implementation phase are integrated into the system. After integration, the entire system is tested for errors and failures.
5. Maintenance - There are some issues that occur in the client environment. A patch has been released to fix these issues. Also, some better versions will be released to improve the product. Maintenance will be performed before these changes are implemented in customer environments.

RESULTS AND DISCUSSION

I. Requirement

Requirements analysis is the first phase of system development to capture information, modes, and specifications about the software desired by the customer. It's important to do this first. This helps us understand what our customers want and how they plan to use it. You should ensure that all your needs are met by your application design so that you don't have to worry about it later.

A. User-friendly control panel:The system should have a user-friendly interface that parents and teachers can easily navigate. This makes it easier to access and manage information related to your child's learning.
B. Security Login:The system requires a secure login system to ensure the confidentiality and security of information about children. Parents and teachers must be able to access the system using unique usernames and passwords.
C. Database management: The system should have a database management system that can store and manage information related to children's learning, such as: B. Progress, Assessment Results, and Learning Materials.
D. Learning materials:The system should provide access to a wide range of learning materials, including instructional videos, interactive games, and educational activities. These materials should be age-appropriate and in line with the early childhood curriculum.
E. Rating and progress tracking:The system should incorporate an assessment and progress tracking system that can track the child's progress and provide feedback to parents and teachers.
F. Reporting:The system should have a reporting function that can generate reports on the child's progress. This includes your child's strengths and areas of improvement.
G. Compatibility:The system should be compatible with a variety of devices and web browsers, including smartphones and tablets, and accessible anytime, anywhere.
H. Technical support:The system should have adequate technical support to assist parents and teachers with any technical issues that may arise while using the system.
I. CodeIgniter Framework:The system should be built using the Codeigniter framework, a PHP-based web application framework. Known for its speed and flexibility, Codeigniter is well suited for developing web-based information systems for early childhood learning.

II. Design

UML (Unified Modelling Language) is used by researchers to create use case diagrams, activity diagrams, and database designs. The system design is created to aid in the development of the system. UML is a set of diagrams, structures, and techniques for modeling and designing object-oriented programs and applications, according to researchers (Kroenke et al., 2018).

a. UseCase Diagram

Use case diagrams are used to determine which functions are available to users and who has access to them. This information system's users are classified as admin staff, teachers, and parent's students. Figure 2 depicts a use case diagram for this information system.

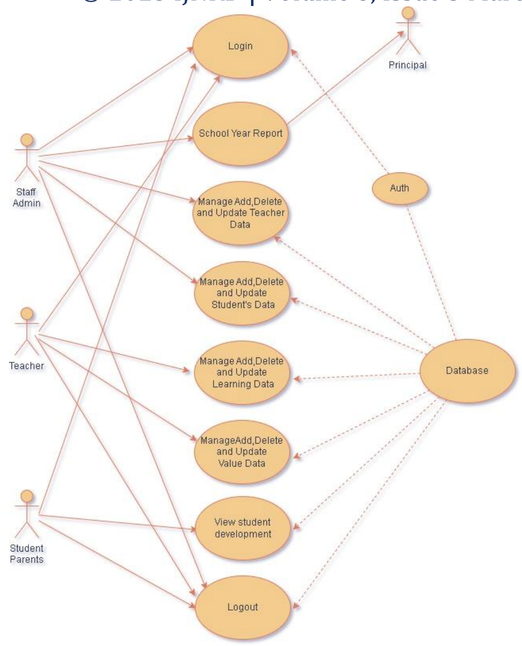

Figure 2 Usecase Diagram

b. Activity Diagram

An activity diagram is a work flow in a program that explains the path that actors will take when running a system.

The activity diagrams below are from early childhood information systems.

1. Activity Diagram Admin

The Early Childhood Learning information system has an administrative activity diagram, which shows that there is a login menu before accessing the system. The admins enters the username and password, and the system checks to see if the username and password are registered as admin staff. If they are not already registered, the process will be repeated to create a new account. If you are successful, you will be taken straight to the admin section. On the admin page, you can add, change, and delete assets from the teacher, student, and activity menus. If the data is successfully saved, a notification will appear, but if it isn't saved, a notify warning will show up. Figure 3 depicts the Admin Activity Diagram.

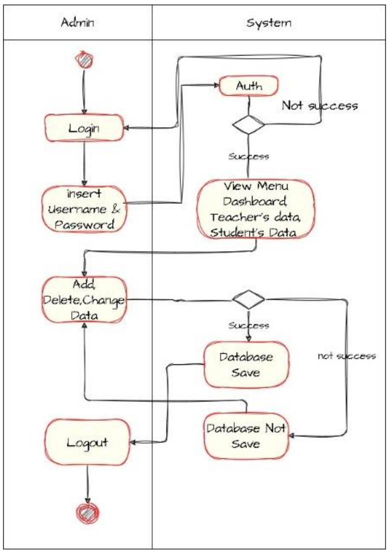

Figure 3 Activity Diagram Admin

2. Activity Diagram Teacher

Before entering the user teacher section, the process is the same as for the admin user: enter the username and password to log in, then verify between the accounts to see if it has been registered; if not, it will return to login to create a new account that has already been verified. The system displays a menu of student value data, lessons, and improvements on this page, which the teacher can add, change, and delete. . If the data is successfully saved, a notification will appear, but if it isn't saved, a notify warning will show up. Figure 4 depicts the Teacher Activity Diagram.

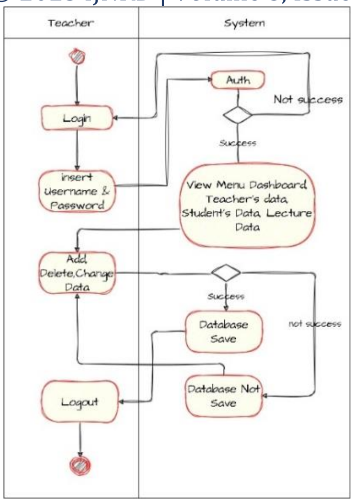

Figure 4 Activity Diagram Teacher

3. Activity Diagram Student Parent's

Before we enter the user section for the student's parents, we must first enter the username and password that correspond to the student's identity and will be verified by the system. Once successfully logged in, we will be taken to the dashboard menu section, where we can see the child's development, the lessons the child requires, and weekly activity. If it is unable to enter, it will return to the login section to create an account that corresponds to the child's identity.

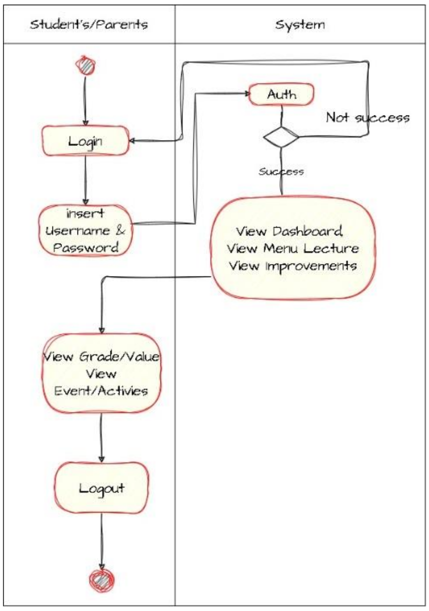

Figure 5 Activity Diagram Student's Parents

c. Class Diagram

A class diagram is a type of UML diagram that depicts the structure of a system by displaying its classes, attributes, methods, and their relationships. It is a powerful tool for visualizing and documenting software architectures and is used to describe the static structure of a system.

User: Represents the users of the system, including both admin, students and teachers.

Grade: Represents the progress of improvements of each student every semester.

Subject: Represents the list of subjects in every new semester

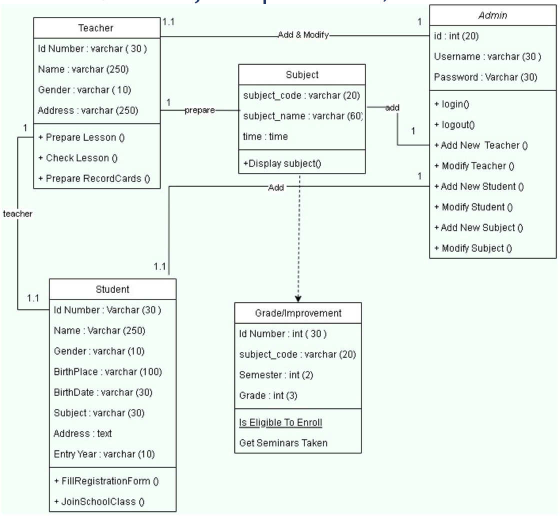

Figure 6 Class Diagram Early Childhood Learning Information System

d. ECLS Input Design (Early Childhood Learning System)

Table 1 Input Design Early Childhood Learning System

No	Input Name	Function	Attribute
1.	Student Data	to obtain information about students enrolled in the early childhood education section	Id Number/School Id Number, Name of Student, Gender, BirthPlace/Date, Address, Subject Chosen, and Entry Year.
2.	Teacher Data	to provide information about the early childhood education section's teachers	ID Number, Teacher Name, Gender and Address.
3.	Improvement Data	to provide information about each child's learning progress	Name of Student, Subject,Class Semester and Grade/Improvement.
4.	Subject Data	information about the subject taught in early childhood education each school year	Subject Code, Subject Name and Time Given in each subject.

e. ECLS Output Design (Early Childhood Learning System)

Table 2 Output Design Early Childhood Learning System

No	Output Name	Function	Attribute
1.	Student Data Report	Displays student data and student lists as well as student personal data	Id Number/School Id Number, Name of Student, Gender, BirthPlace/Date, Address, Subject Chosen, and Entry Year.
2.	Teacher Data Report	Displays information to give information about the teacher	ID Number, Teacher Name, Gender and Address.
3.	Improvement Data Report	Information about each child's development is shown using data.	Name of Student, Subject,Class Semester and Grade/Improvement.
4.	Subject Data Report	Displays the data subject that enters each school year	Subject Code, Subject Name and Time Given in each subject.

III. Implementation

At this point, the researcher has created a web-based early childhood learning information system that can be used for every Earlly Childhood Learning Center.

a. Display Registration Form

The Registration Form is used to register new students or students who have not registered in the system and to be able to access the web.

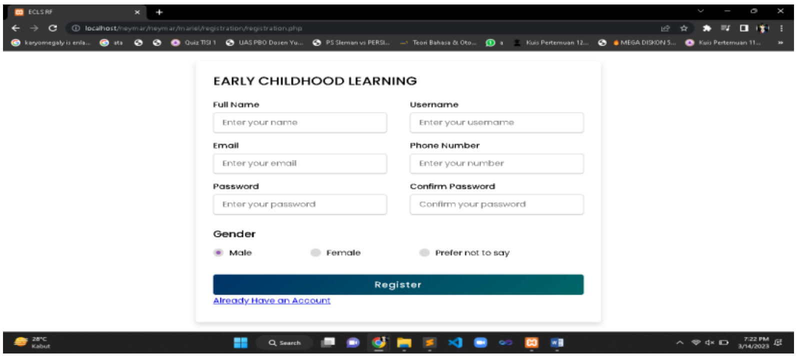

Figure 7 Registration Form

b. Login Page Display

The Login page is used to enter the Administrator Menu, which consists of a Username and Password

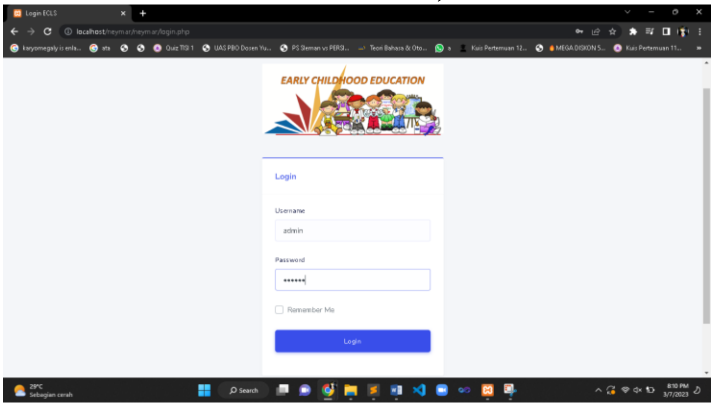

Figure 8 Login Page

c. Dashboard Page Display

The Dashboard page contains information on teacher and student data, subject data, child developmentscores and can input data such as student data, teacher data and others.

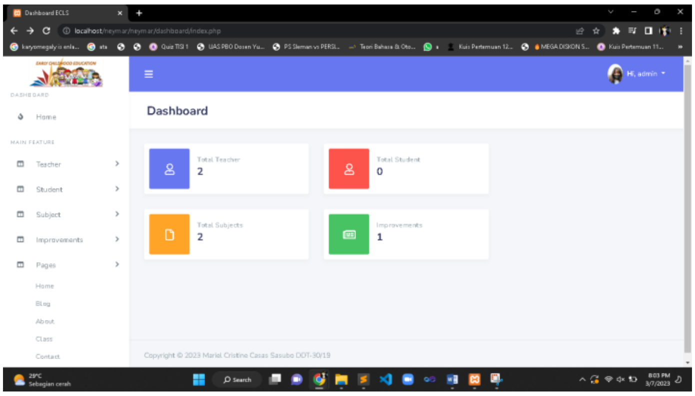

Figure 9 Dashboard Page

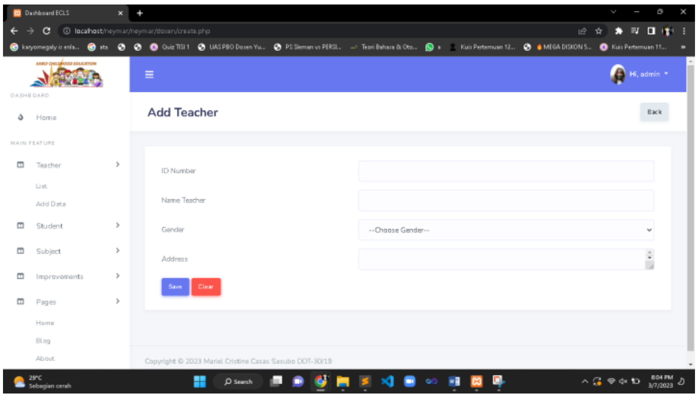

Figure 10 Teacher Page

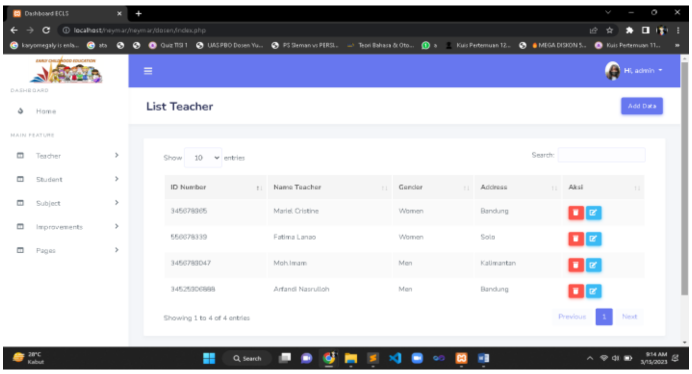

Figure 11 Teacher Data

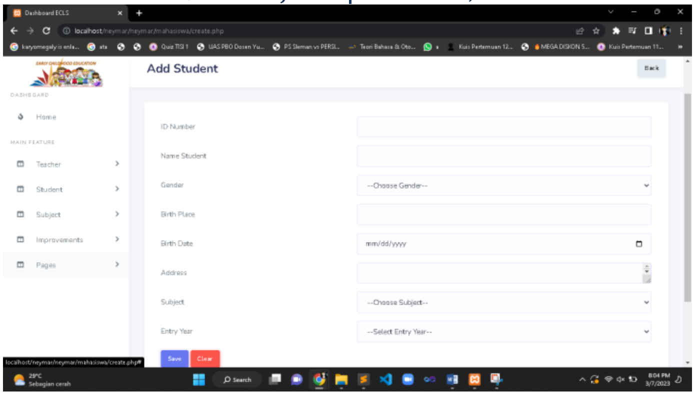

Figure 12 Add Student

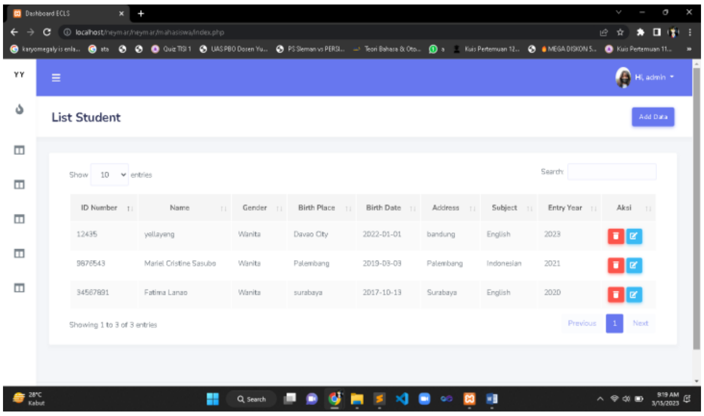

Figure 13 Student Data

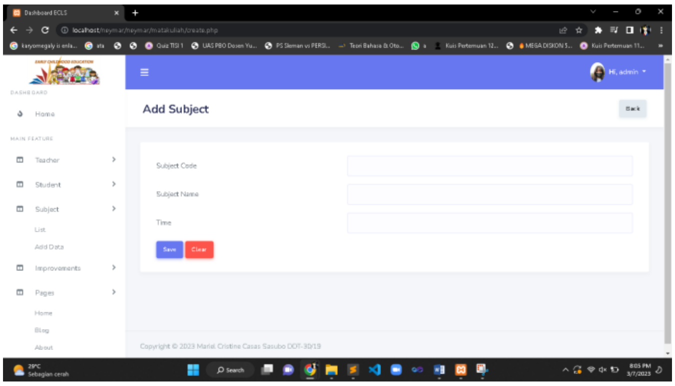

Figure 14 Subject Page

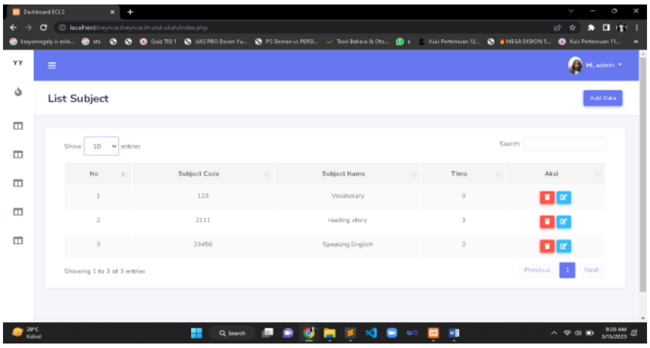

Figure 15 Subject Data

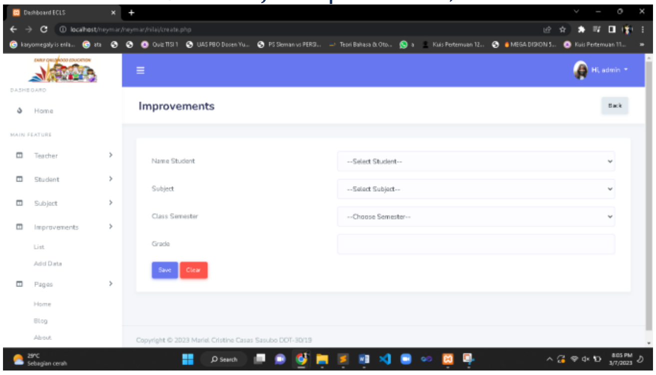

Figure 16 Improvements Page

d. Home Page Display

The home page includes the initial display page, information about us and the web itself, several lessons that are frequently taught in early childhood education, a teacher page where you can learn more about the teachers who frequently instruct, and other things.

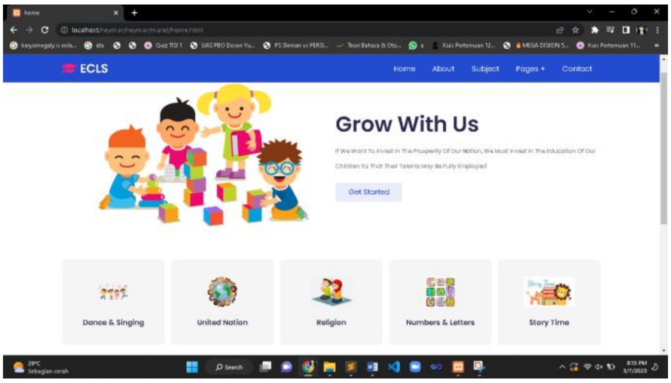

Figure 17 Home Page

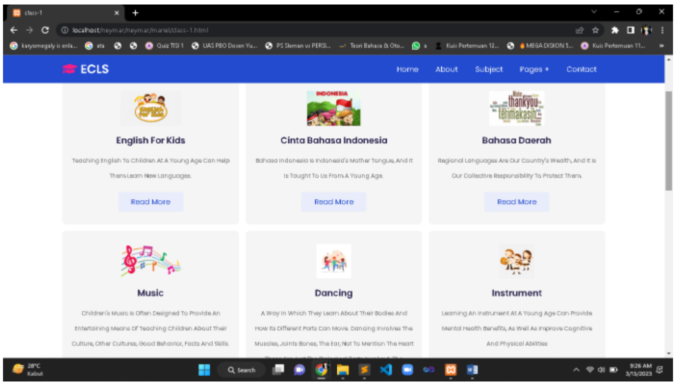

Figure 18 Subject Page

IV. Testing

a. Black Box Testing

Black box testing is used to ensure that the system steps that have been created and developed can process and run in accordance with system functions, as well as test every component in the system. The test is performed by comparing the input and output to reach a conclusion. This test is designed to persuade the early childhood education section that each component is functioning properly.

Table 3 BlackBox Testing

NO	FUNCTION TEST	TEST FORMS	RESULTS	STATUS
1	Login	Username and Password Correct	Go to main admin page	Success
		Incorrect Username and Password	back to login page	Success
2	Register	Create New User	Go to Login Page	Success
3	Forgot Password	Change old account	Go to Login Page	Success
4	Student	Click menu add Student	Go to Student Add Page	Success
		Click Menu Edit Student	Go to Student edit Page	Success

		Click Menu Delete Student	Go to Student Delete Page	Success
5	Subject	Click Menu Add Subject	Go to add Subject Page	Success
		Click Menu Edit Subject	Go to edit Subject Page	Success
		Click Menu Delete Subject	Go to Delete Subject Page	Success
6	Teacher	Click Menu Add Teacher	Go to add Teacher Page	Success
		Click Menu Edit Teacher	Go to edit Teacher Page	Success
		Click Menu Delete Teacher	Go to Delete Teacher Page	Success
6	Improvements	Click Menu Add Improvements	Go to add Improvements Page	Success
		Click Menu Edit Improvements	Go to edit Improvements Page	Success
		Click Menu Delete Improvements	Go to Delete Improvements Page	Success
7	Home Page	Click Menu Home	Go to Home Page	Success
8	Subject	Click Menu Subject	Go to Subject page	Success
9	Teacher Profile	Click Menu Teacher	Go to Teacher Profile Page	Success
10	Contact Us	Click Menu Contact Us	Go to Contact Us Page	Success
11	Blog	Click Menu Blog	Go to Blog Page	Success
12	About Us	Click Menu About Us	Go to About Us Page	Success

b. Usability Acceptance Test

The questionnaire sheet is then distributed to staff and educators in early childhood education. Author collected a series of questions from the stretch performed for the next user.

NO	QUESTION	ANSWER					TOTAL SCORE	PERCENTAGE
		VG	A	PG	E	B		
1	How Quickly Can You Access The Website?							
2	What Do You Think Of The Website's First Appearance?							
3	How About The Ease With Which You Can Find Information On The Website?							
4	What Do You Think Of The Website's Menus?							
5	What About The Website's Learning Data Information?							
6	How Complete Is The Website's Information?							
7	Is The Website Open To The Public?							

Table 4 Questionnaire

Answer Explanation
VG-Very Good
A-Agree
PG- Pretty Enough
E- Enough
B- Bad

$$Z : \frac{P}{\Sigma\eta} \times 100\,\%$$

Table 5 Respondent Questionnaire Results

Question	Answer Value						Percentage Of Answer Values				
	VG	A	PG	E	B		VG	A	PG	E	B
	5	4	3	2	1		5	4	3	2	1
Q1	3	6	1	0	0		30	60	10	0	0
Q2	6	3	1	0	0		60	30	10	0	0
Q3	4	5	1	0	0		40	50	10	0	0
Q4	2	7	1	0	0		20	70	10	0	0
Q5	5	5	0	0	0		50	50	0	0	0
Q6	1	9	0	0	0		10	90	0	0	0
Q7	4	6	0	0	0		40	60	0	0	0
Total							250	410	40	0	0
Average							35%	58%	7%	0	0

According to the results of the testing, 35% said "very good," 58% said "good," 7% said "enough," and 0% said they disagreed with the information system that was created. so that overall the system can be categorized as proper and can be used properly.

V. Maintenance

The maintenance stage is the final stage in the waterfall method's design and development. This maintenance is performed to keep the system safe and operational. System maintenance can be performed if system functions fail to function properly later on.

CONCLUSION

Based on research conducted on the development and manufacture of early childhood education information systems, the system operates according to its function both from input and output, and no errors are found in system functions tested using the blackbox method. Early childhood education information systems can help users overcome difficulties in obtaining information in early childhood education. The previous lack of information has been replaced by the ease with which all information can now be obtained. It is hoped that the presence of an early childhood education information system will make it easier for users, both teachers and parents, to manage and obtain information.

BIBLIOGRAPHY

Aisah, K., Yanto, H., & Firdaus, F. (2021). Perancangan Sistem Informasi Aplikasi E Learning Berbasis Web Di SMA N 9 Padang. Jurnal KomtekInfo, 8(1), 66-72

Alboaneen, D., Almelihi, M., Alsubaie, R., Alghamdi, R., Alshehri, L., & Alharthi, R. (2022). evelopment of a web-based prediction system for students' academic performance. Data, 7(2), 21

Aurachman, R. (2020). Kerangka Perancangan Sistem Informasi Sebagai Pembelajaran Mahasiswa Teknik Industri.

JIIP-Jurnal Ilmiah Ilmu Pendidikan, 4(5), 340-345. Al Ayyubi, S. (2023). Rancang Bangun Sistem Informasi Pembelajaran SMA Trimurti Surabaya (Doctoral dissertation, UPN Veteran Jawa Timur).

Lestari, R. H., Sumitra, A., Nurunnisa, R., & Fitriawati, M. (2020). Perancangan Perencanaan Pembelajaran Anak Usia Dini Melalui Sistem Informasi Berbasis Website. Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini, 5(2), 1396-1408.

Mayasari, A., Supriani, Y., & Arifudin, O. (2021). Implementasi Sistem Informasi Manajemen Akademik Berbasis Teknologi Informasi dalam Meningkatkan Mutu Pelayanan Pembelajaran di SMK.

Munandar, A., Sulistiani, H., Adrian, Q. J., & Irawan, A. (2020). Penerapan Sistem Informasi Pembelajaran Online Di Smk Al-Huda Lampung Selatan. Journal of Social Sciences and Technology for Community Service (JSSTCS), 1(1), 7-14.

Sherley, Y., Ardian, Q. J., & Kurnia, W. (2021). Rancang Bangun Sistem Informasi Media Pembelajaran Berbasis Website (Studi Kasus: Bimbingan Belajar De Potlood). Jurnal Teknologi dan Sistem Informasi, 2(3), 136-147Sumardi, D., Suryani, N., & Musadad, A. A. (2021). Website-Based learning management system (LMS) as a tool for learning in the covid-19 pandemic period for junior high schools. Journal of Education Technology, 5(3), 346-355.

BOOK

Amanda Armstrong - "A Digital Learning Foundation for World-Class Schools: Design Principles and Practices" (2018), published by Routledge in New York, New York.

Chip Donohue - "Family Engagement in the Digital Age: Early Childhood Educators as Media entors" (2019), published by Routledge in New York, New York.

Dr. Akhmad Sodikin, S.Kom., M.Kom., "Pemanfaatan Sistem Informasi Berbasis Web dalam Peningkatan Efektivitas Pendidikan di Indonesia", 2019, Yogyakarta: Deepublish.

Jon Stuebe, CodeIgniter: Beginner's Guide to Learn CodeIgniter 3.1.10, 2018, Packt Publishing.

Jose Argudo Blanco, CodeIgniter 4 Quickstart Guide: Build modern web applications using PHP 7, MVC, and RESTful APIs, 2020, Packt Publishing.

Karen N. Nemeth - "Digital Decisions: Choosing the Right Technology Tools for Early Childhood Education" (2018), published by Gryphon House in Beltsville, Maryland.

Lacey Peters - "Digital Play for Global Citizens: Promoting Equity and Diversity in the Early Years" (2023), to be published by Routledge in New York, New York.

Lori Takeuchi - "The New Coviewing: Designing for Learning through Joint Media Engagement" (2021), published by MIT Press in Cambridge, Massachusetts.

Rachmadhoni, A., & Rachmadhoni, A. F. A. (2019). Sistem Informasi Sekolah Berbasis Web: Studi Kasus SMPN 9 Kota Bandung. Jurnal Mantik Penusa, 3(1), 22-28.

Sanjay Kumar, CodeIgniter Web Application Development: Integrate CodeIgniter and Bootstrap to create robust web applications, 2021, Packt Publishing.