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Davelopment of a Multimedia Website as a Learning Tool for English and Mandarin for Student at PT. Global Mitra Akademi (Oaklearn Center)

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I N F O A R T I C L E

Keywords:

website multimedia, elearning, language learning, waterfall method, educational tecnology

ABSTRACT

The use of information technology in education is a solution to improve the effectiveness of learning, especially foreign language learning. At PT. Global Mitra Akademi (Oaklearn Center), English and Mandarin language learning still requires more interactive and easily accessible media. This research aims to develop and implement a multimedia website as a learning tool for English and Mandarin for students at PT. Global Mitra Akademi (Oaklearn Center). The problem in this study includes the process of developing and implementing a multimedia website to support learning activities. The system development method used is the waterfall method. Data collection was carried out through observation, literature study, and interviews with staff and students at PT. Global Mitra Akademi (Oaklearn Center). The research results show a positive response; this e-learning website can facilitate access to materials and support English and Mandarin language learning more effectively.

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INTRODUCTION

The development of information technology has brought significant changes to various aspects of life, including education. The field of education is required to present a learning system that is faster, more efficient, and more effective in order to improve the quality of students learning processes[1]. Technology is becoming a crucial factor in supporting learning interactions and achieving optimal learning outcomes[2]. Public perception of how information is obtained is also changing, with the development of information technology, where conventional information sources such as magazines and newspapers are beginning to be replaced by the internet, which provides information that is easier and more up-to-date[3].

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E-learning has emerged as an innovative solution that provides broader access to learning materials and greater flexibility in time and location for its users[4].

The use of websites in education is not just as an information medium, but has evolved into web-based software that combines text, images, and video elements to create an interactive learning experience[5]. This transformation is highly relevant considering that the majority of current students are part of Generation Z, known as the iGeneration or internet generation, who are skilled at maximizing the application of technology in their daily lives[6]. Some popular elearning, such as Duolingo and English Academy, demonstrate this digital transformation with interactive approaches, CEFR curriculum, and direct interaction with professional instructors[7].

At PT. Global Mitra Akademi (Oaklearn Center), English and Mandarin language learning is still predominantly conducted offline, which presents challenges in terms of coordination and data management. The manual distribution of materials and reporting of learning outcomes leads to poorly organized information, resulting in a risk of miscommunication and inefficiency in monitoring student progress regularly[8].

This problem highlights the need for a more structured and integrated learning mechanism through an information system capable of systematically accommodating every activity[9]. Some previous studies have shown that web-based and multimedia learning media are effective in increasing student motivation and learning outcomes[10]. However, most research is still limited to a single language or platform and has not yet accomodated multilingual learning, particularly English and Mandarin, within a single integrated system. Technically, the website is developed using the PHP programming language and the MySQL database to ensure flexibility, centralized storage, and efficient data management[11]. XAMPP was chosen as the web server for ease of local testing[12], while Visual Studio Code is used as the main text editor in the development process[13]. The Waterfall method is applied as a development methodology to ensure a systematic workflow, from analysis to implementation[14]. The system evaluation is conducted through Black Box testing to ensure functionality meets user requirements[15].

Based on the above description, this research aims to develop a multimedia e-learning website for English and Mandarin language learning for students at PT.Global Mitra Akademi (Oaklearn Center). It is hoped that this research can improve the quality of education and the flexibility of student learning.

METHODS

The research obectives and problem mus be addresed with appropriate research methods. Research typically begins with careful planning and a logically and systematicallyy compiled set of instructions to ensure that the results are usable and reflect the actual situation. Figure 1 showns the stagess carried out in this study :

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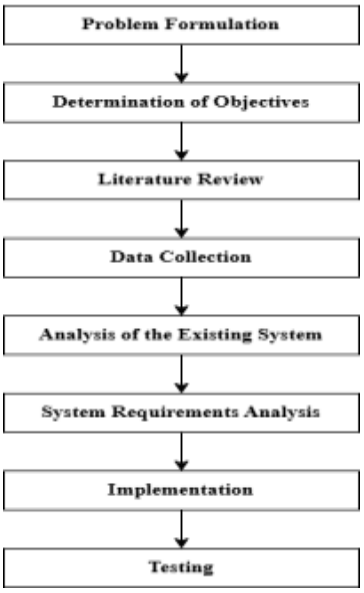

Figure 1. Research Stages

DATA COLLECTION

In this study, the author applied several data collection methods to obtain necessary information, including:

1. Interview

Data collection techniques were carriout through direct interviews with staff and students of PT. Global Mitra Akademi (Oaklearn Center) in order to obtain information ralevant to the needs of e-learning website development.

2. Literature Study

Data collection was carried out through a literature study utilizing sources related to the research.

3. Observation

Direct observation was conducted by the author by directly observing the current learning process at PT. Global Mitra Akademi (Oaklearn Center), which is still predominantly offline.

System in Operation

Based on data collection during the period from September to December 2025, there were 80 new students who registered and participated in the English and Mandarin language learning programs. The current learning system is presented in Figure 2 below:

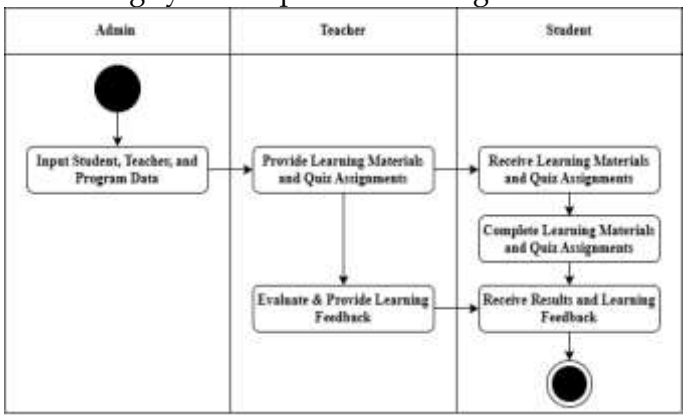

Figure 2. System in Operation

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The current learning system at PT. Global Mitra Akademi (Oaklearn Center) is described as follows :

1. The administrator only manually input basic student and academic data, as well as learning program data, without automatic system integration.
2. The inputted data is stored on multiple media, such us spreadsheets or separate documents, resulting in less centralized data management.
3. Teachers deliver materials and learning programs manually.
4. The learning process is conducted offline in the classroom, with teachers directly handling out materials and quizzes, while students physically subit assignment
5. Monitoring of learning activities is still manual.

Waterfall System Development

The research method applied in this study is the development of the waterfall method. The waterfall method is systematic and sequential information system develoment model

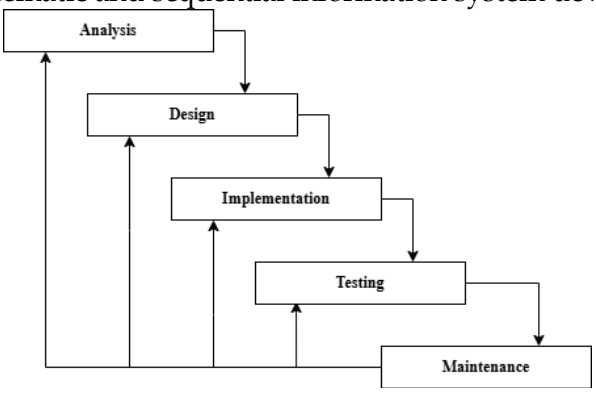

Figure 3. Waterfall System Development

1. System Design

System design is a system of activities carried out to design a system with logically arranged work stages, starting from collecting the data for the design process.

Use Case Diagram

A use case diagram is used to illustrate how a system functions from the perspective of external users. In this system, there are several actors involved who are the users of this e learning system.

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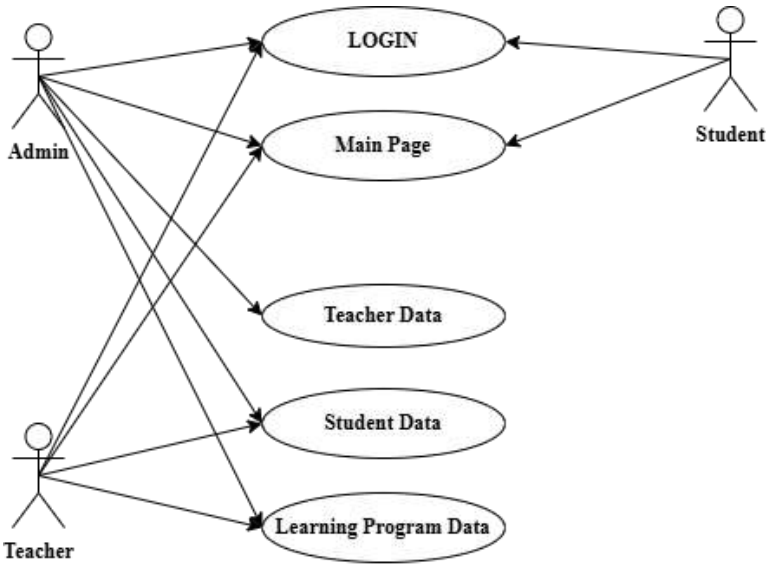

Figure 4. Use Case Diagram

Table 1. Description of the Use Case Diagram

No	Aktor	Deskripsi
1.	Login	This is the process for logging into the ELearning website, which is accessible to all actors.
2.	Homepage	Each logged-in actor will be directed to their respective main page.
3.	Students data	This is the process of inputting student data managed by the administrator.
4.	Teachers data	This is the process of inputing tecahers data managed by the administrator.
5.	Learning program data	This is the process of inputing data for the programs taken by students.
6.	Materials	This is the process of inputing learning materials done by teachers or the academic team.

Class diagram

A class diagram illustrates the structure and description of classes, packages, and objects, along with the relationship between them, such as associations and dependencies, that make up a system. Each class consists of attributes and operations that represent the system's state and provide services to manage that state through specific functions. The class diagram for the Oaklearn E-Learning system consists of several main, interconneted clases, namely *Users, Siswa Detail, Guru Detail, Admin Detail, Courses, Course Detail, and Capaian Materi,* as shown in figure 5:

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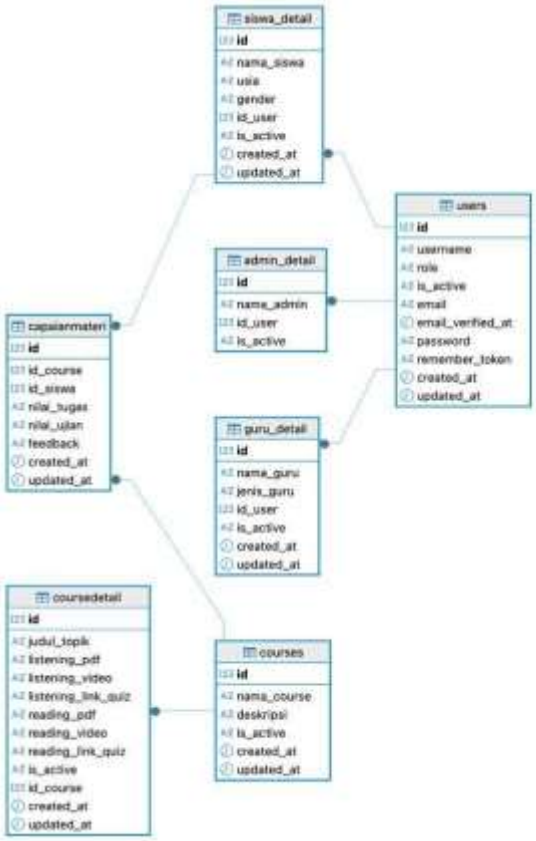

Figure 5. Class Diagram

2. Black Box Testing

Black box testing is a type of testing that verifies the execution results of an application based on the inputs provided to ensure the application's functionality meets the requirements.

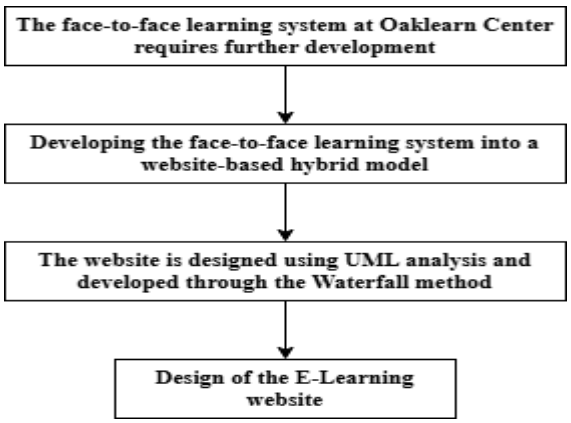

Figure 6. Conceptual Framework

Proposed System

The proposed system is designed as a hybrid learning system aimed at increasing the flexibility and effectiveness of the students' learning process, as presented in Figure 7 below:

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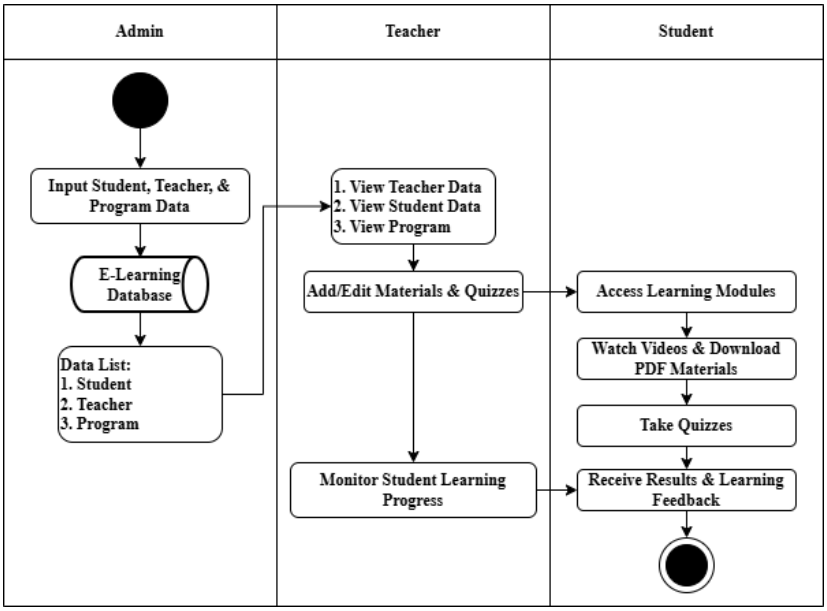

Figure 7. Proposed System

The proposed hybrid learning system for PT. Global Mitra Akademi (Oaklearn Center) is designed to enhance the flexibility and effectiveness of the student learning process, as outlined below:

1. The administrator inputs student data, academic team data, and learning program data into the system.
2. The entered data will be stored centrally in the system's database.
3. The stored data is displayed on the system and can be accessed by the academic team and students, with student access limited to viewing data without the ability to modify or delete it.
4. Teachers have the authority to add and update learning program materials and data.
5. During the learning process, teachers add materials and quizzes, then students download the materials or assignments and take quizzes as a form of learning progress.
6. Teachers monitor online learning activities.

RESULTS

Based on the e-learning website design research conducted by the author, using data collection methods thru observation, online questionnaire interviews utilizing Google Forms, where the author distributed questionnaires to ten samples and eight of them responded, with 80% of the respondents providing a positive response to the research conducted by the author.

1. Login Page

On the login page, the user will fill out a form containing a username and password, as shown in the following image:

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Figure 8. Login Page

2. Admin Page

The following is the appearance of the admin page, where after successfully logging in, you will be directed to the main admin page. On this page, the admin can input, edit, or delete student data, teacher data, and learning program data

Figure 9. Admin Page 3. Teacher's Page

The teacher's page contains materials with program descriptions and material details, as well as student data.

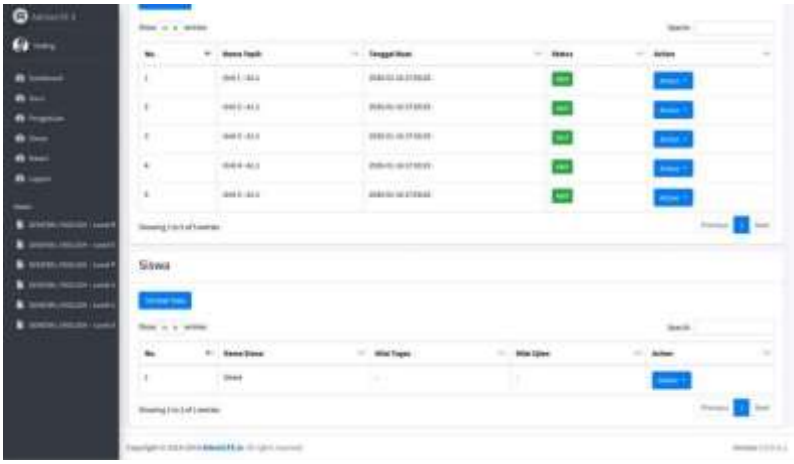

Figure 10. Teacher's Page

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4. Student Page

Students who have successfully logged in will be directed to the main student page. This page provides a language setting feature that allows users to choose one of three languages: Indonesian, English, and Mandarin.

Figure 10. Indonesian Language Student Main Page

Figure 10.1. English Language Student Homepage

Figure 10.2. Mandarin Language Student Homepage

On this page, students will be provided with and can only access learning materials according to the program they previously registered with the Admin.

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Figure 11. Digital Materials

This is the display after the student selects to enter the learning material provided in the main menu. This display contains details of the student program material.

Figure 12. Student Material Details

This display is the form view for students to download materials, interactive learning media videos, and quiz forms. This display is divided into 2 categories: listening and reading. Students can also automatically resubmit their quiz answers or responses thru this form.

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Figure 13. Students' Reading Material

Figure 14. Student Listening Material

This display illustrates the progress evaluation form and student learning assessment, where teachers input grades and provide feedback as part of the learning evaluation process.

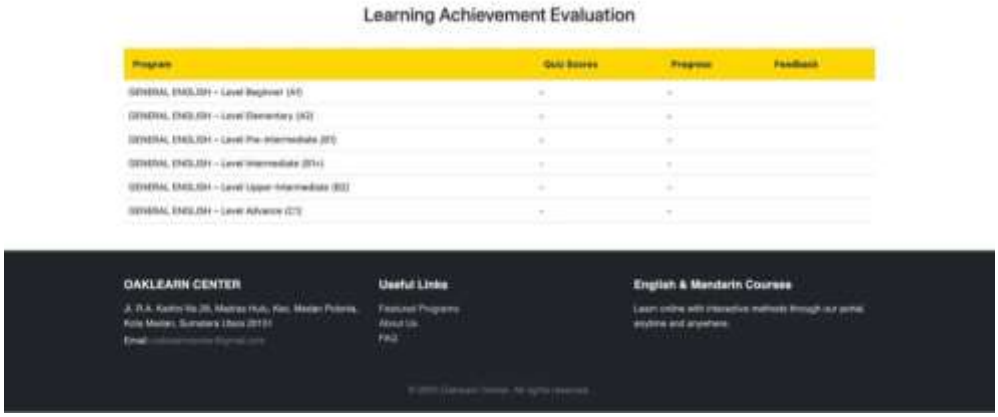

Figure 15. Student Progress Evaluation

Students also have access to report system learning constraints to the admin thru the complaint service form as part of the system support services.

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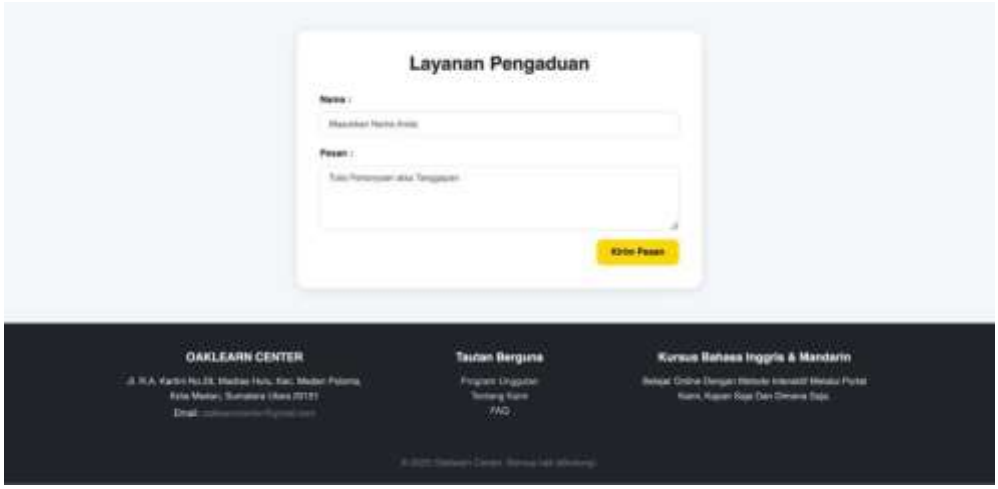

Figure 16. Complaint Service

E-Learning Testing

No	Objective	Test Description	Expected Results
1.	Test login function	Enter username and password on the login page, then click the login button.	Login successful and a "login successful" message will appear, the system will close the login form and redirect to the main e-learning page.
2.	Test login function	If the entered username or password is incorrect	Login failed, the system will display a message stating that the username or password is incorrect.
3.	Test save function	Enter name and material, then click the save button	Data successfully saved to the database and a "data saved successfully" message appears.
4.	Test save function	Enter data but not in the specified format	Data failed to save to the database and does not appear in the system.

CONCLUSION

Based on the research findings and discussions that have been conducted, it can be concluded that the development of a multimedia-based website as a means of learning English and Mandarin at PT. Global Mitra Akademi (Oaklearn Center) has been successfully implemented in accordance with the research objectives. The developed website is capable of integrating various multimedia elements, interactivity, and a centralized database, thus supporting the hybrid learning process in a more structured and effective manner. The implementation of this multimedia website provides ease for teachers in managing materials, quizzes, and learning evaluations, and helps students access learning materials and complete assignments flexibly without time or place limitations. Thus, this website not only serves as an e-learning learning medium but also as a company profile that enhances the quality of educational services at PT. Global Mitra Akademi (Oaklearn Center).

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