



Implementation of the Heuristic Evaluation Method in the Design of the School Academic Information System Website

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Abstract

In the world of education, the role of teachers and parents is very influential in the process of improving student learning achievement. However, in reality, most parents only give responsibility to teachers at school to improve student learning achievement. Parents of students rarely monitor the development of their children's learning abilities due to the lack of information about it. Global Prima National Plus School is one of the leading private schools in Medan, located on Jalan Brigjend Katamso. Currently, Global Prima National Plus School uses Microsoft Excel to manage student data and student test scores. However, the implementation of this system still has several weaknesses, namely parents cannot monitor attendance and directly know the development of student scores and behavior. This will reduce parental participation in their children's educational development. To solve the problems faced by Global Prima National Plus School, an application can be created to monitor student learning development. By using this application, parents of students can obtain information about student attendance data, attitude and behavior scores, assignment scores, and test scores directly, without having to wait for report cards to be distributed. With this web-based student learning progress monitoring application, parents can find out information about student attendance, attitude scores, behavior, exam scores and assignment scores which can be accessed directly through the school website.

Keywords: students; schools; monitoring; learning; websites

1. Introduction

Science and technology continue to develop rapidly in the current digital era. Technology has provided numerous benefits, particularly in education, government, and other fields, particularly for human life. The impact of this technological development, particularly in education, is crucial, including the increasing ease of access to information [1]. In education, one application of technology in the 4.0 era is the academic information system designed for academic data management using computer technology, both hardware and software. This allows all academic processes to be managed as useful information for management and decision-making [2]. This academic system aims to support the implementation of education, enabling educational institutions to provide effective and efficient information services [3].

Global Prima National Plus School is one of the leading private schools in Medan, located on Jalan Brigjend Katamso. Currently, Global Prima National Plus School uses a computerized system to manage tuition payments and a Go Home system for picking up kindergarten students from school. However, Global Prima National Plus School still uses Microsoft Excel to manage student exam score data. Furthermore, the process of recording student attendance at Global Prima National Plus School still uses an attendance book. The implementation of this system has several drawbacks. Parents cannot know whether their children (especially junior high and high school students) are attending school. Furthermore, parents cannot monitor their children's educational progress at school at all times.

To address the challenges faced by Global Prima National Plus School, a web-based academic information system can be implemented. This study chose to design a website considering that it can be accessed anytime and anywhere. It is not restricted to a specific operating system, allowing it to be accessed on all types of mobile devices (Android and iOS) or on computers or laptops. Furthermore, the website does not need to be downloaded or installed on a mobile device before use. This study will use the Waterfall method to design this information system because it creates a more organized process and a more structured sequence of work processes from one stage to the next [4].

Ease of use of an application is one of the many factors that can significantly influence consumer purchasing intention [5]. Therefore, it is necessary to analyze the application's User Interface (UI) and User Experience (UX) to determine user satisfaction with the website design. User Interface (UI) and User Experience (UX) are essential components of application development. User Interface (UI) is the interface of a system through which users interact. User Experience (UX) is the result of the interaction between the user and the system. Several methods for analyzing UI/UX exist, such as User-Centered Design (UCD) and Heuristic Evaluation. These methods are used to assess user usability when using an application. Heuristic Evaluation is a method for measuring the extent of usability problems in software interface design [6].

2. Theoretical Review

2.1. Education

Education is a conscious effort to carry out training and guidance activities as a form of effort to prepare students for life in the future. So that students can develop their potential to be able to control their personality, attitude, intelligence, and morals. Digitalization in Education is interpreted as a process of transfer carried out in the field of Education into digital form in order to achieve educational goals. Digitalization of Education is the management of a system that uses technology as a tool in achieving its transfer. In every aspect of education, it is required to use technology in every aspect such as, curriculum, administration, media, and methods used [7].

2.2. Technology in Education

The use of technology can create conducive learning conditions, because technology can simplify and accelerate students' tasks and improve their skills in utilizing technological advances. Therefore, innovation in education is important, because innovation is the development of knowledge to create or significantly improve new processes or systems [8]. Information technology is the development of information systems by combining computer technology with telecommunications. The development of information and communication technology (ICT) has a significant influence on various aspects of life. One of them is the field of education. ICT has had a huge impact on the world of education. Before ICT was known, the world of education was still carried out in a manual and traditional manner [9]. In the world of education, the strategic and appropriate use of information and communication technology is key to efforts to rebuild education while encouraging quality learning for the nation's children [10].

2.3. Heuristic Evaluation

Heuristic Evaluation is a usability engineering method for identifying and identifying usability problems in user interface design, which can then be addressed as part of an iterative design technique. Heuristic Evaluation involves a small group of testers analyzing the interface and assessing its compliance with agreed-upon usability principles. Heuristic Evaluation is a user-based evaluation system for assessing the usability of computer software. This system involves evaluators providing evaluations and feedback, which are then categorized according to 10 heuristic principles.

3. Research Methods

The system analysis stages in this research include the data collection process and analysis of the running system.

3.1. Methods of Collecting Data

The data collection methods in this study are:

- a. Interviews
An interview is a data collection method conducted through questions and answers with several sources at the research location, with the aim of gaining in-depth information and understanding of the topic being discussed. The interview process involves structured or open-ended questions to allow the sources to provide detailed information. The interview was conducted with Mr. Ericson Wijaya, an administrative staff member. The questions asked concerned the process of recording and managing class data, student data, student attendance data, and student grades.
- b. Observation
Observation is data collection through direct observation of a number of objects studied within the research context. In observation, the researcher actively records and observes observed events or behaviors. The primary goal of observation is to gain a deep understanding of what is happening in the field, involving direct monitoring. The observation process in this study was conducted at Global Prima National Plus School for two weeks. The observation process included observing the process of managing student attendance and grades.
- c. Literature Review
This study was conducted to review a series of articles, books, and other references related to learning monitoring information systems. The main goal was to compile and analyze information from various sources to gain a comprehensive understanding of the development of knowledge in the field of learning monitoring. It is important to note that the literature review is not simply a summary of existing literature but also a critical analysis of existing understanding.

3.2. Current System Analysis

Currently, Global Prima National Plus still uses manual recording for student attendance. For elementary, middle, and high school attendance, each teacher receives a list of students in their class, which the teacher marks during attendance check. Meanwhile, Global Prima National Plus still uses Microsoft Excel to process student grades. Student data is recorded in a Microsoft Excel application created using the Macro feature.

4. Overview of Proposed System

The functional requirements analysis for the proposed system will be conducted using use case diagrams, which map the system's functions based on the interactions between users (actors) and the system. Use case diagrams visually illustrate what each user can do and how they do it, helping developers understand and design the system according to user needs. The proposed system's use case diagram design can be seen in Figure 1.

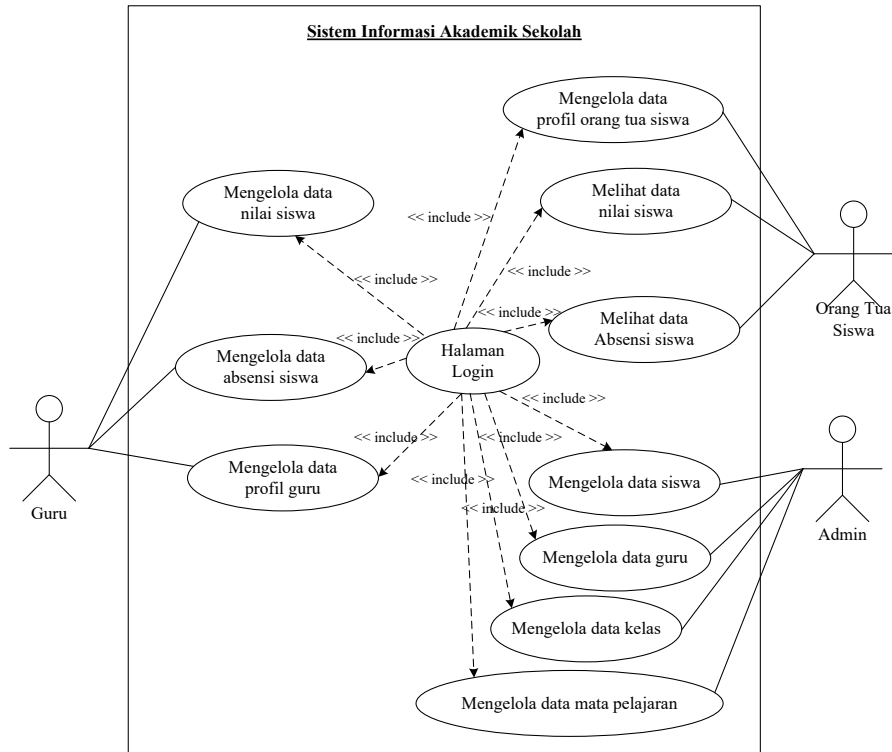


Fig. 1: Use Case System

5. Implementation and Testing

The user interface of the proposed system can be detailed as follows:

a. Login Page

The first page that appears when running a web-based application is the Login page as shown in Figure 2.

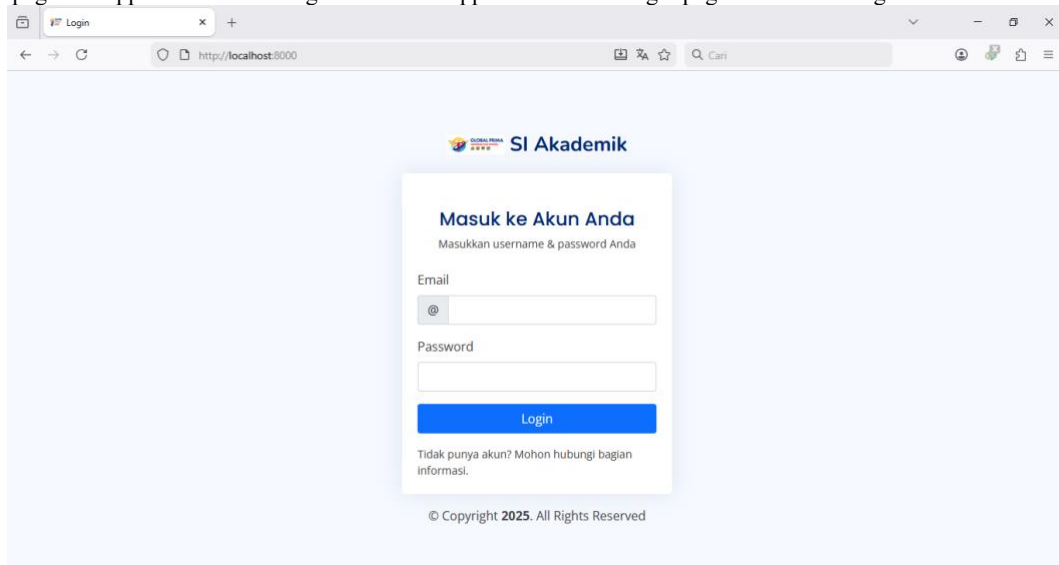


Fig. 2: Login Page

Users must enter the correct user ID and password to access the system. This web-based student progress monitoring application has three user types: admin, teacher, and parent. The user information entered on the login page determines the type of home page displayed next.

b. Home Admin Page

If the login process using the admin user is successful, the system will display the Home Admin page as shown in Figure 3.

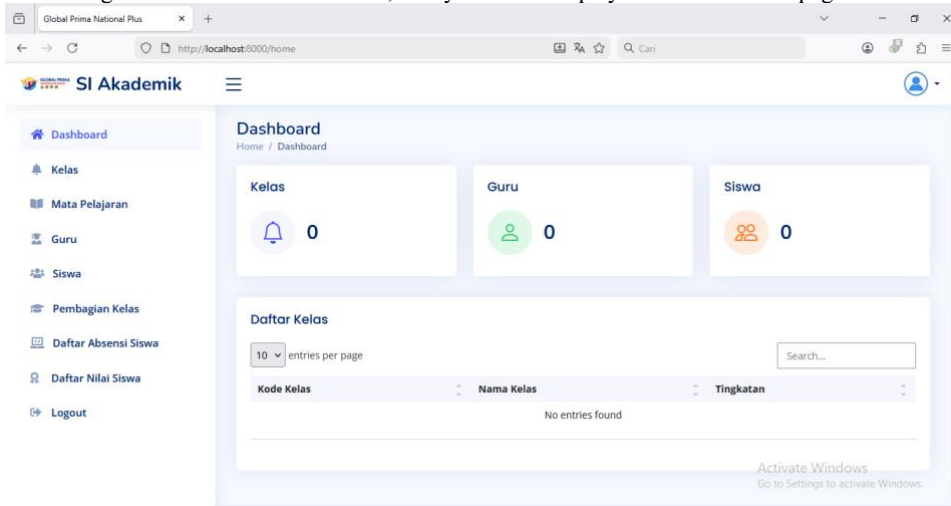


Fig. 3: Home Admin Page

On this Home Admin page, there are several menus that can be accessed, including the Dashboard, Class, Subject, Teacher, Student, Class Division, Student Attendance List, Student Grade List and Logout menus.

c. Home Teacher Page

If the login process using the teacher user is successful, the system will display the Teacher Home page as shown in Figure 4.

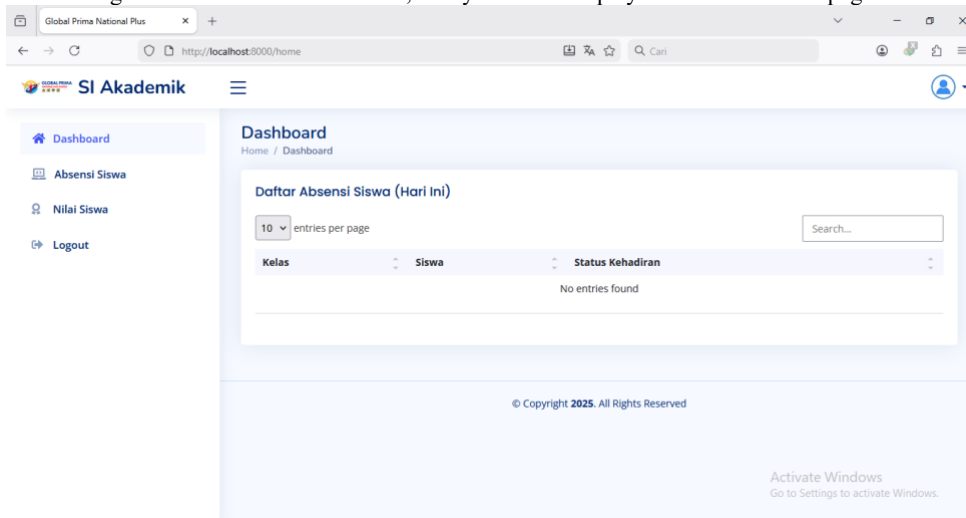


Fig. 4: Home Teacher Page

d. Home Parent Page

If the login process using the student user is successful, the system will display the Student Home page as shown in Figure 5.

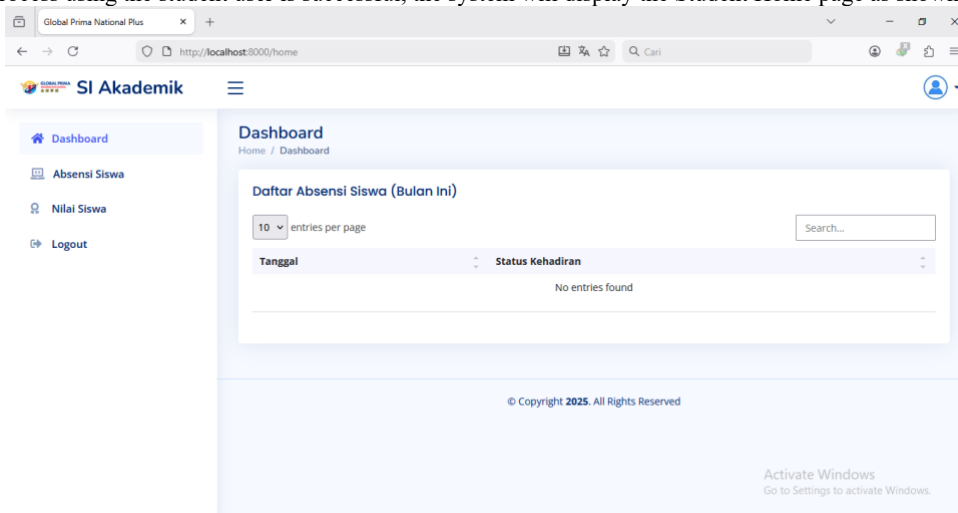


Fig. 5: Home Parent Page

e. Input Class Page

To add new class data to the system, you can click the Add Class Data button on the Class List page, so that the system will display the Class Data Input page as shown in Figure 6.

Fig. 6: Input Class Page

f. Subject Input Page

To add new subject data to the system, you can click the Add Subject Data button on the Subject List page, so that the system will display the Subject Data Input page as shown in Figure 7.

Fig. 7: Subject Input Page

g. Teacher Input Page

To add new teacher data to the system, you can click the Add Teacher Data button on the Teacher List page, so that the system will display the Teacher Data Input page as shown in Figure 8.

Fig. 8: Teacher Input Page

h. Student Input Page

To add new student data to the system, you can click the Add Student Data button on the Student List page, so that the system will display the Student Data Input page as shown in Figure 9.

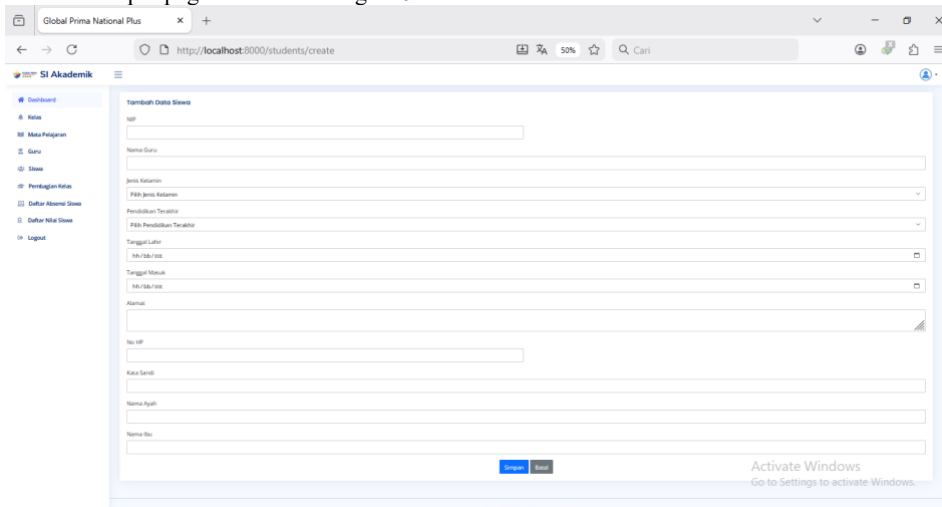


Fig. 9: Student Input Page

i. Student Attendance Input Page

To add new attendance data from students, you can click the Add Attendance Data button on the Student Attendance List page so that the system will display the Add Attendance Data page as shown in Figure 10.

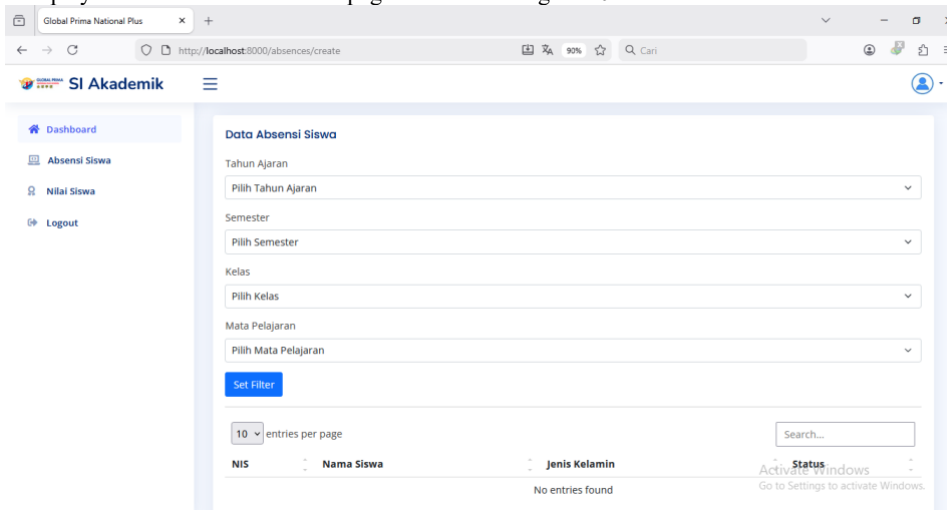


Fig. 10: Student Attendance Input Page

j. Student Grade Input Page

To add new value data, the teacher user can click the Add Value Data button on the Value List page so that the system will display the Add Value Data page as shown in Figure 11.

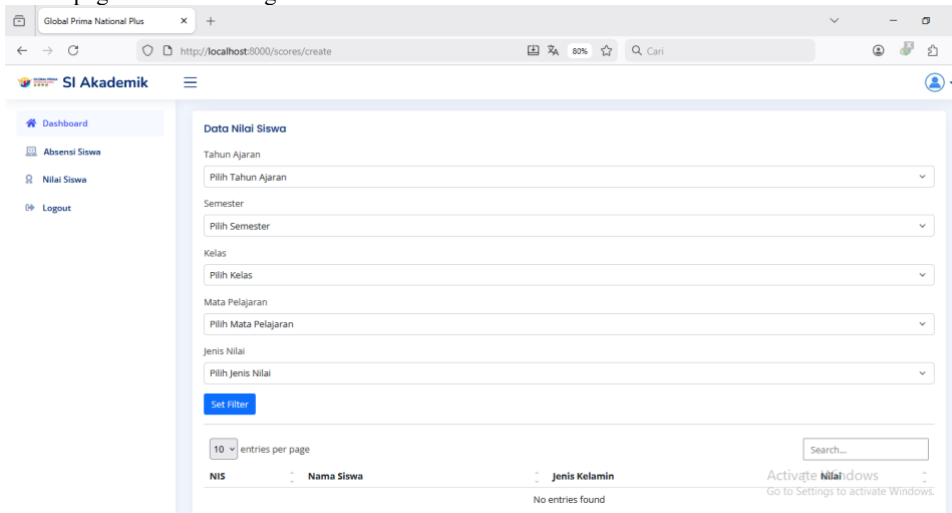


Fig. 11: Student Grade Input Page

6. Conclusion

With this web-based application, parents can access student attendance information, attitude and behavior scores, test scores, and assignments directly through the school website. Each type of user has access to different menus, each with its own unique functions. The author's suggestions regarding the development of this system are as follows:

1. It is recommended to add a feature that allows administrators to access the system.
2. The system can be further developed by designing a mobile application that can send direct notifications to parents if a student is absent from school.

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