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Development of Student Performance Assessment Applications using Website-based Gamification Concept

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Abstract. Violations that continue to increase, as if unconsciously, can affect the teacher's assessment of students. To overcome this issue, an application for student performance assessment was developed using the concept of web-based gamification to reduce the frequency of violations. The purpose of this study is to improve the quality of students by encouraging them to adhere to school rules and rewarding those who comply. The research employs the concept of gamification and a daily assessment method, whereby assessments are carried out every day and calculated monthly. This method involves communication, planning, modeling, and construction, culminating in deployment. The results show that the web-based assessment application, utilizing gamification methods, can effectively improve student behavior in a more positive direction. Additionally, testing of the black box functionality revealed successful results, demonstrating that the application is reliable and feasible for use. Overall, the application motivates students to improve their discipline in order to achieve good results.

Keywords: Gamification, Performance, Discipline, Web

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1. Introduction

Information technology can be applied using web engineering development methods, a software engineering model used to develop web-based systems. Quality web-based systems can help companies save on operational costs, simplify deposit, and loan processes, and enable access to information from anywhere. Gamification is the integration of game elements and design techniques into non-game applications to encourage desired behavior, such as the use of leaderboards, points, levels, and badges. This creates an atmosphere of healthy competition

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among system users, making tasks more interesting. Work performance is a record of results obtained from certain job functions or activities over a specific period. Students with good performance will receive awards from their teachers as a form of appreciation for following rules. Rewards can take non-financial and financial forms and are used to foster recognition and a sense of acceptance within an organization. Discipline is crucial in human life since a lack of it can harm oneself, others, and the environment.

2. Method

2.1. Method of Communication phase

During the development stage, data collection is essential. Data collection typically involves two stages namely observation and interview.

2.1.1. Observation

During this stage, the author conducted observations by examining the case study in the student security division at Daar el-Qolam High School, located on Raya Serang Street, Pasir Gintung, Jayanti District, Tangerang Regency, Banten.

2.1.2. Interview

Prototyping is a software development method that involves obtaining prototypes through interviews to gather necessary information. The goal of these interviews is to create a student performance appraisal application that uses a 360-degree assessment method to ensure objectivity. This method assesses students through their superiors, friends, and self-evaluation, and uses the concept of gamification to motivate students to improve themselves. With this application, it is hoped that assessments will be both objective and motivating.

2.1.3. Problem Identification

Based on the results of observations and interviews, assessment process is still done manually using an assessment form, which is time-consuming. Then, errors occur frequently when calculating grades and the forms are often damaged. Student assessments also lack objective parameters, leading to subjective evaluations. Lastly, student assessment process is one-way, which further contributes to subjective evaluations.

2.2. Planning Phase

This study involved mapping all activity processes from data collection to the completion of the application implementation process (refer to Table 1).

Table 1. Planning phase of this research

No	Activity	Period															
		July	August				September				October				November			
		4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Observation																	
2	Data collection																	

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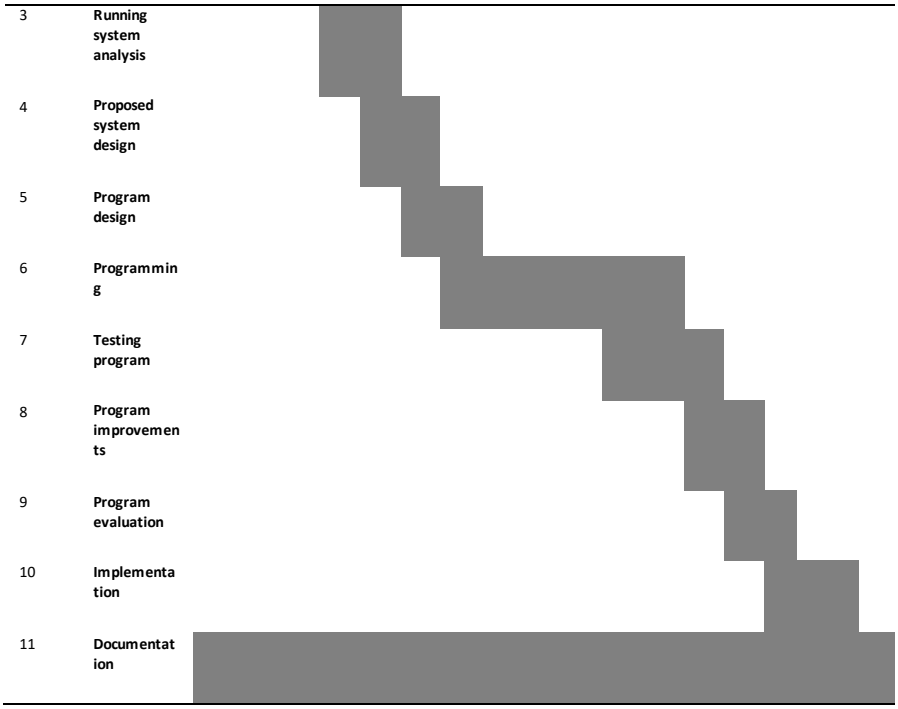

2.3. Construction Phase

At this stage, the system is designed and developed. In the previous stage, the system flow was presented through diagrams and prototype designs. In this stage, the design is translated into a code or programming language that can be understood by a code reader, resulting in the development of the actual system.

2.4. Deployment Phase

In the final stage, the system is implemented and made available to the user, followed by providing training on its usage. The system is evaluated for any potential issues or problems.

3. Results and Discussion

A discipline assessment system for student performance with gamification consists of several elements.

The elements for student assessment are:

1. Points, which are important references for determining the level of students;
2. Challenges, which provide motivation and a sense of achievement;
3. Leaderboards, which rank students from lowest to highest and spur them to achieve higher positions; and

3.1. Component period page

The component period page is a feature of the discipline assessment system for student performance with gamification. It allows users to manage the variable components, indicators, and criteria used in the assessment process by opening and closing component periods based on a specific time frame. This menu provides a time provider for the system, enabling administrators to define and set the duration of each component period.

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By using this menu, administrators can ensure that the assessment process is carried out efficiently and effectively within the designated time frame. For example, they can set a deadline for submitting assessments, and the system will automatically close the component period after the deadline has passed. This feature also helps to prevent errors or inaccuracies in the assessment process by ensuring that all assessments are submitted within the designated time frame and reviewed by the appropriate authorities.

Overall, the component period page is an essential feature of the discipline assessment system for student performance with gamification, as it helps to ensure that the assessment process is managed effectively and efficiently (see Figure 1).

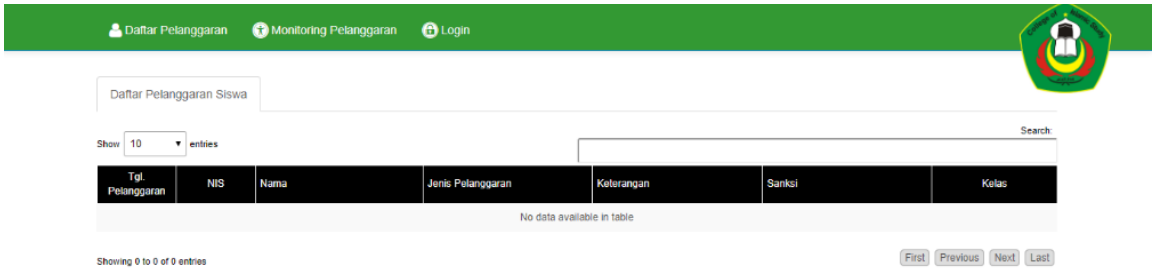

Figure 1. Component period page

3.2. Assessment period page

The assessment period page allows for the management of the assessment periods over the course of a year. Users can open or close assessment periods as needed and make changes to the assessment period dates using the edit menu. This ensures that the system is up to date with the academic calendar and that assessments are conducted within the appropriate timeframe (see Figure. 2).

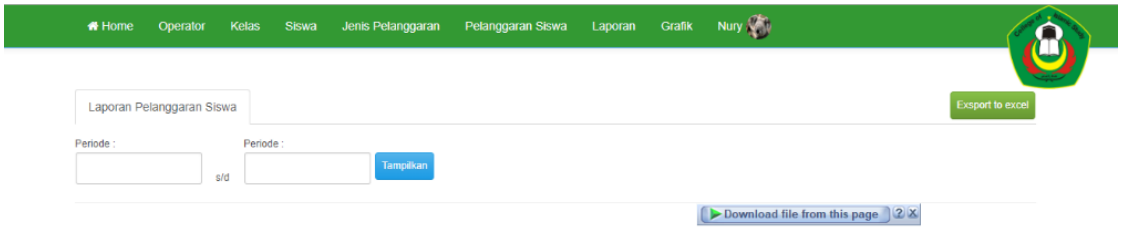

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Figure 2. Assessment period page

3.3. Behavioural assessment page

The student behaviour assessment page has four assessment points to evaluate the behaviour of the student, which are very poor, less than good, good, and very good. The page includes a form that allows teachers or evaluators to assess the student's behaviour based on specific criteria. The criteria may include attendance, punctuality, participation, attitude, and other relevant factors (see Figure 3).

Figure 3. Behavioural assessment page display

3.4. Assessment results data page

As shown in the figure below, the data page of the Student Performance Discipline Assessment Application displays the results of student tests. The page shows the name of the student, the class, and the score obtained in each subject.

The application automatically calculates the scores based on the data entered by the teacher or staff member responsible for entering the data. This makes the assessment process more accurate and reduces the risk of errors that can occur when doing manual calculations. In addition, the application also provides a summary of the student's overall performance based on the scores obtained in each subject. This allows teachers and school administrators to quickly identify areas where a student may need additional support or attention. Overall, the Student Performance Discipline Assessment Application provides an efficient and reliable way to manage student assessments and track their progress over time (see Figure 4).

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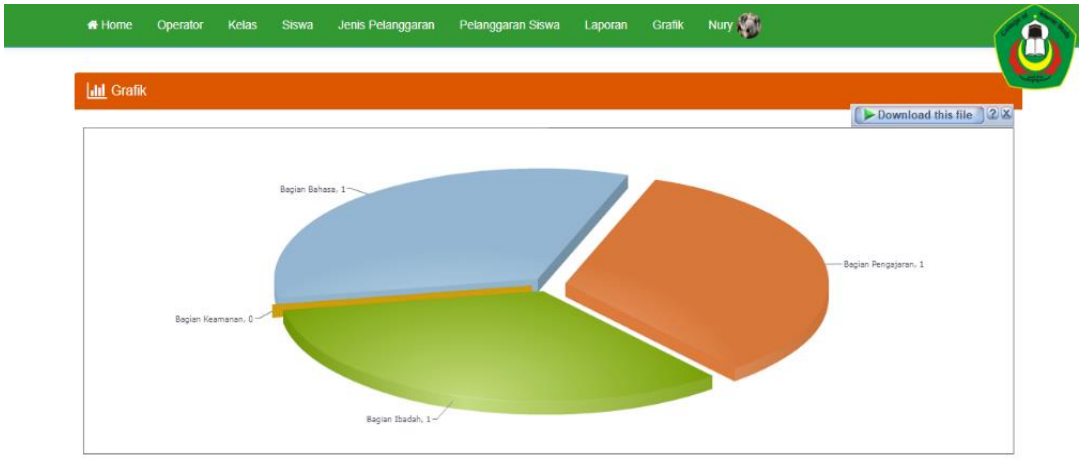

Figure 4. Assessment results data page

3.5. Leaderboard page

The Student Performance Discipline Assessment Application uses gamification elements to motivate students to improve their behavior and performance, such as point systems, challenges, and leaderboards. These elements provide a sense of achievement and competition that can encourage students to engage in positive behavior and strive for higher levels of performance. The leaderboards can be a powerful motivator as students can see their progress and compare themselves to their peers, spurring them to work harder and do better (see Figure. 5).

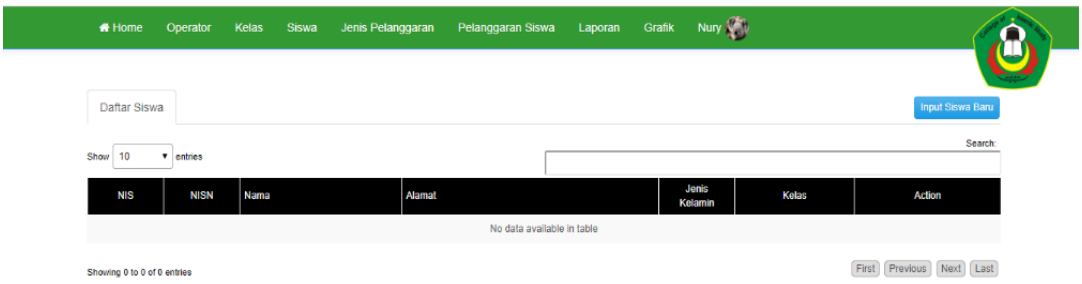

Figure 5. Page leaderboard

3.6. Challenge page

The following is an example of a way to give students a challenge and points (see Figure 6).

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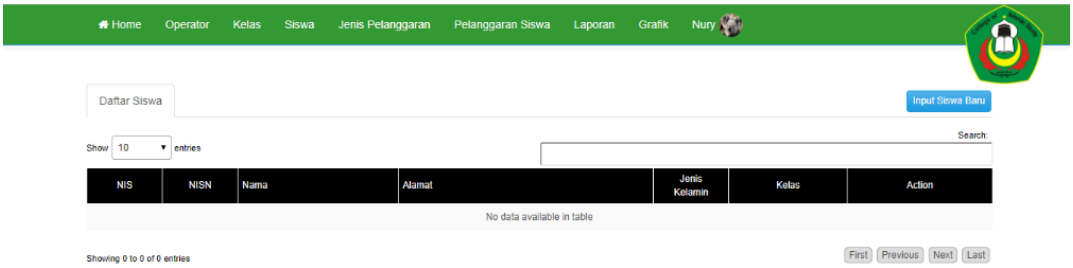

Figure 6. Challenge page

4. Conclusion

The research can also conclude that the application of web-based gamification in student performance and discipline assessment can increase student motivation and engagement in the learning process. This is because the use of gamification elements such as points, challenges, and leaderboards can create a competitive and enjoyable learning environment for students. Moreover, the automatic calculation of student scores by the system can reduce the workload of teachers and increase the accuracy of assessment results. The system also allows for easy monitoring of student behavior and progress, enabling early intervention and support for students who need it. Overall, the application of web-based gamification in student performance and discipline assessment can be an effective and efficient tool for promoting positive student behavior and academic success.

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