

Conference Paper

Building a Learning Management System which Features Gamification of Appreciative Inquiry for a Remote Elementary School in Indonesia

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Abstract.

Communication between teachers and students is not limited to the physical classroom but has shifted to include the online classroom. A learning management system (LMS) is an app or software that aids in administration, documentation, finding materials, reporting on an activity, and providing online teaching and learning materials. The purpose of this research is to build a Learning Management System (LMS) which features gamification of appreciative inquiry. Gamification motivates students to learn and makes it easier for teachers to provide materials and give assignments to students. The study was carried out using the waterfall method. The waterfall method includes analysis requirements, system and software design, implementation, and unit testing.

Keywords: Gamification, LMS, Appreciative Inquiry

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1. Introduction

The use of technology has influenced various aspects of life. One of them, technology has starting to enter the world of education starting from education elementary level to senior level education. Communication that intertwined between teachers and students is not only limited in the classroom but has shifted with utilization technology outside the classroom (1). Teachers can communicate with students via the internet by utilizing applications which is currently available. Especially during the covid pandemic, most educational institutions have turned to online learning platforms to keep academic activities running (2).

SD Negeri Sugihrejo 01 is one of elementary schools in Pati district Central Java Indonesia. The school in learning such as the provision of teaching materials, namely

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by giving printed books for students to read and study. If the teacher gives assignments in the textbook, then students must collect assignments by collecting textbooks that has been given so that students cannot learn further materials at home. It is felt not effective, because it poses some big risks like data is lost when the operator's computer or laptop damaged, students are easily bored with learning that monotonous so they do not have more motivation to learn. Based on some of these problems Learning Management System (LMS) is one of the technological developments that can be used. Web-based Learning Management System (LMS) in schools has their benefits and advantages in development schools (3). One of the important components of the teacher's role is to operate student motivation. That is, to increase the level of motivation with the aim of producing positive results, such as tenacity, excellence and outstanding performance (4),(5),(6). Gamification is the application and use of elements game design into a non-game context. Non-game context in this study is a Learning Management System (LMS). AI Method (Appreciative Inquiry) is based on a belief that the system built and developed by those who live and work in it. AI method focuses on 'positive' data' and use positive analysis to generate potential and future possibilities. The concept of AI is actually closely related to the gamification process, especially in the provision of rewards, which also departs from a positive achievement or advantages. With a description and design of the concept as well as design as described, then make it Learning Management System (LMS) With Features Gamification of Appreciative Inquiry at SD Negeri Sugihrejo 01.

The purpose of this research is to build Learning Management System (LMS) With Gamification Features Appreciative Inquiry that can make students motivated to learn and make it easier for teachers to provide material and assignments to students.

2. Method

In this study, the author uses the waterfall method. The waterfall method is one type of application development model and included in classic life cycle, which one emphasizes sequential and systematic phases (7). First : Requirement Analysis, gathering needs that will be used well in the form of functional and non-functional needs functional. Observation and interview was needed for collecting data through direct observation or review directly related to research. Data collection through face-to-face and direct question and answer with the principal and school operator.

Second : System and Software Design for the system design stage, the author uses design tool, namely UML (Unified Modeling Language) which consists of: Use Case

Diagrams, Activity Diagrams, Sequence Diagrams. Apart from planning object-oriented, the author also does user design interface with the aim of generating a display as needed.

Third : Implementation and Unit Testing. This stage is to make programming or do the coding to create the system and use algorithm in the LMS to be created.

The next step : System Integration and Testing. This stage is testing the system using black box testing, white box testing, and also user accepted testing (UAT). And the last : Operation and Maintenance User-operated ready-made software and maintenance carried out. Maintenance possible developer to make fixes for errors which were not detected in the earlier stages. Maintenance includes repair of errors, repairs implementation of system units, and improvement and system adjustment as needed.

3. Result and Discussion

Based on observational studies in schools and interviews with principals, we mapped the problems, impacts and suggestions in table 1.

TABLE 1: Problems Mapping.

Problems	Impact	Suggest
Online Learning is still carried out with WhatsApp group media by only giving assignments.	Students learn if there is only an assignment, when the task is finished they are negligent in repeating the material being taught.	Built a system that can support effective online learning
The data is not and the subjects and attendance are not well organized.	Data access is not flexible so that it slows down the handling of data collection and information recap.	The system provides data collection features that are stored in a good database for easy access to information.
Giving material that is monotonous or too pegged to the book.	Students become bored so students often ignore what the teacher says.	The system provides a feature for uploading material so that teachers can provide varied material.
Students' learning motivation is low due to online learning.	Students become less enthusiastic about learning and prefer to play.	The system provides an appreciation feature for competent students

Functional requirements analysis is any process or service provided by the system. It includes how the system should react to certain inputs and how the system behaves in

certain situations. After going through the requirements analysis stage, the next stage is to design a software system.

In the design we determine the use case of the system. Use case itself is a process of drawing done to show the relationship between the user and the designed system. In this use case diagram there are 3 actors, namely admin (school operator), students and teachers. Admin can manage teacher data (add data, edit data, delete data, view data), manage student data (add data, edit data, delete data, view data), and manage material data (add data, edit data, delete data, view data) in the system. Users (teachers) can upload materials, upload assignments, create quizzes, view teacher data, view student data, view awards, and can also view answers to assignments that have been given to students. Users (students) can download materials, download assignments, do quizzes, view awards, upload answers to assignments that have been given by the teacher, view teacher data, and also view student data.

The three users are required to login first in order to enter the system. The system verifies the username and password of each user who wants to access the system. If successful, the system will display the main page of each user, if it fails, the system will display the login page again and ask the user to fill in the correct username and password.

The interface design for student awards is depicted in Figure 1. This page contains data on students who received awards in the form of stars. This award is calculated automatically based on the accuracy of collecting assignments and the value obtained from their assignments.

Figure 2 represents implementation the award page. The award here is calculated based on the total assignments and student grades. It is in this award page that Gamification is applied. If a student does the assignment on time and gets a score of more than 75 out of 100, he/she will get a 2-star award. If the student does the assignment on time and gets a score of less than 75 then he gets a 1 star award. If the student doesn't do it then the student does not get an award. The admin awards page is equipped with a class filter to see the awards for each class.

After the student gets the award, the teacher can print it out. Printed awards are the output of student awards, where prints of these awards can be used for school or teacher archives. Teachers can give rewards or prizes to students who get the highest rating or award in their respective classes. The teacher can also give other appreciations as students who excel that semester.

Realization of Learning Management System With Features Gamification of Appreciative Inquiry at Elementary School was carried out in several stages including needs

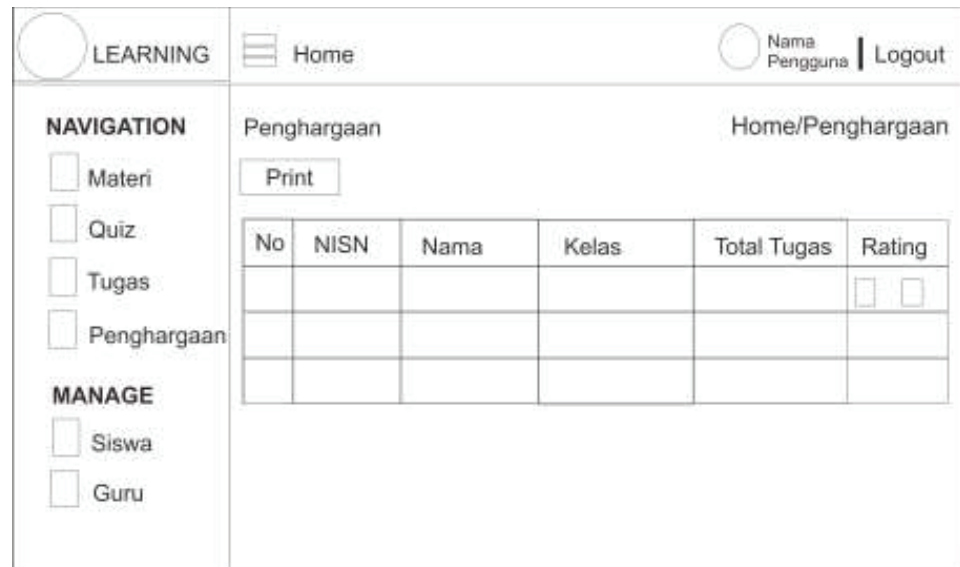


Figure 1: Interface Design for Student Award.

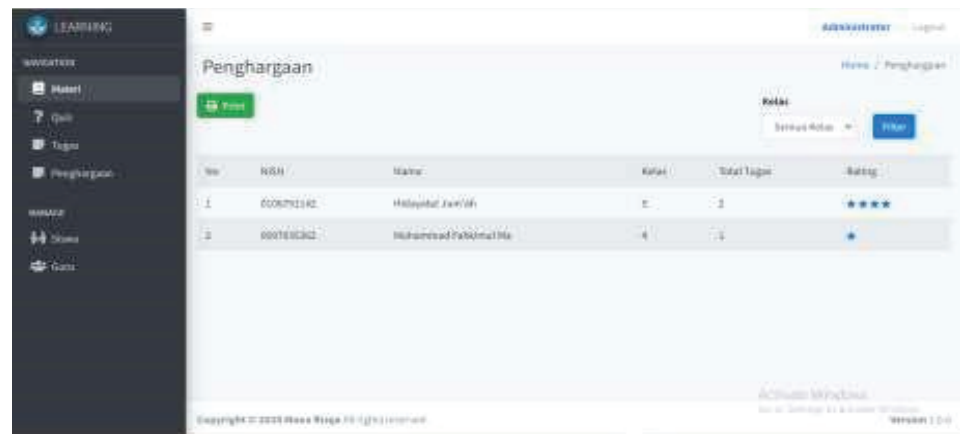


Figure 2: Implementation Design for Student Award.

analysis, system and software design (UML diagrams, interface designs and programming). The next stage is the implementation and testing of the system. The Learning Management System was created using the CodeIgniter framework using the Hypertext Processor (PHP) programming language.

After the system is completed, a black-box test is carried out which aims to find out or test the functional specifications in other words to test whether the functions in the system can run well.

4. Conclusion

In this work, we have successfully designed Learning Management System with the Appreciative Inquiry Gamification Feature at remote elementary school. The LMS design

steps consist of analysis requirement, designing, implementation and testing stages. The conclusion obtained from the results of the Black Box test is that the system has carried out its functions properly and provided the expected results. In the user acceptance test, two tests are carried out : testing in terms of ease of use and in terms of appearance. This test was conducted several respondents. The percentage result on the user acceptance test is 82%, which means that the Learning Management System with the Appreciative Inquiry Gamification Feature at remote elementary school is in accordance with the requirements regarding teaching and learning activities.

What remains to be explore is how the effect of the appreciation of the results of gamification on the progress of the learning outcomes of all students engagment in the class or in a particular chapter. This is a concern for further research.

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