Design and build Moodle Learning Management System (LMS) for Athlete students

Erwin Yuningsih¹, Gigih Adjie Biyantoro¹, Eko Sugiharto¹*, M. Wahyu Utomo¹, and Nilam Ade Pangestu¹

¹Surabaya State University

Abstract. Optimization of student achievement is carried out with various efforts, including participating in training for preparation for achievement matches. Students of the Faculty of Sports and Health Sciences (FIKK) Surabaya State University (Unesa) who attend training often apply for dispensation not to attend lectures. This has an impact on the quality of learning because students are constrained by place and time so they cannot attend lectures and are only given assignments. So, a system is needed so that student-athletes can take online lectures that are more flexible in time and place. But, FIKK Unesa does not yet have an online lecture system for students. Therefore, this study aims to design and build a Moodle learning management system for student-athletes at FIKK Unesa. The method used in designing and creating the system is waterfall using the Moodle LMS framework. The results showed that the Moodle LMS that had been designed and built could run and function properly.

1 Introduction

Student achievements can make the image and good name of the college proud. This is in line with the achievements of Surabaya State University which obtained 6th place nationally with a superior predicate in the university category in the Student Ranking Management Information System (SIMKATMAWA) in 2021 [1]. One aspect of the documents prepared in SIMKATMAWA is the aspect of student achievement awards. So, it can be concluded that achievement is very important for universities and competes with other colleges. Therefore, universities must provide support for all students to optimize their achievements both in academic and non-academic fields.

The Faculty of Sports and Health Sciences (FIKK) is one of the faculties at Surabaya State University (Unesa) producing many achievements, especially in the field of sports. Based on data from the Student Achievement Reporting System (SIMPELMAWA), in 2021 there were reports of 228 student achievements which increased to 375 achievements in 2022 [2]. This figure is an achievement reported by students, not yet achievements that are not reported by students due to lack of documents and others.

To achieve optimal achievements, students must work hard by attending training and others before participating in competitions. This is in line with the definition of achievement expressed by Dahar [3] which is the result of whatever has been done and created tenaciously

* Corresponding author: ekosugiharto@unesa.ac.id
either individually or in groups in a particular field. Because of the match preparation training activities, not a few students who applied for dispensation permits did not attend lectures. In 2022, the number of applications for dispensation permits at FIKK Unesa reached more than 500 applications. As a form of university support for student achievement, granting permission for dispensation not to attend lectures on the condition that the student must contact the course supervisor.

The obstacle faced when students make a dispensation not to attend lectures is that the replacement of lectures that are left behind is only in the form of assignments because they are limited in place and time because they are scheduled to practice at certain hours. So with such a learning model in a short time, the quality of learning is less than optimal. Priambodho et al. [4] revealed that the students needed lectures that were conducted by combining distance and face-to-face learning. One solution is to provide a learning management system (LMS) as an online class for distance learning.

One of the factors in the creation of LMS is to perfect the SIDIA or SIKADU application owned by students. The disadvantage of these two applications is that there is no upload of materials and lecture questions for students (athletes) who apply for dispensation. So LMS is needed as a forum for students (athletes) to continue to carry out their duties as students so as not to miss the lecture material.

LMS is a system that carries out learning management such as identifying, assessing, tracking progress, and collecting assignments like Baumgartner's face-to-face classroom learning. Muhardi et al. [5] Research revealed that LMS is an online learning solution due to limited time, place and meetings between students and teachers because it can be done outside the classroom. In addition, with the LMS the interaction between teachers and students is increasing.

The general characteristics of LMS presented include:

a) Learning Content
   Allows the preparation and delivery of learning materials such as videos, texts, assignments, and exams.

b) Interaction and Collaboration
   Provide tools to interact, collaborate, and discuss between participants and instructors (lecturers)

c) Evaluation and Assessment
In this context, it allows the creation of exams, assignments, and assessments as well as providing feedback to students.

d) Yield measurement
Provide insight into student learning outcomes and achievements through analytical tools.

Similar research was also conducted by Nurpalah & Nasrulloh [6] which showed that there was an increase in student motivation by 17.68% after using LMS. So, it can be concluded that the learning management system is very necessary in today's learning so that it is not constrained by limited time and place because it can be done outside the classroom.

But, FIKK Unesa has not used LMS as a solution for student-athletes who are in the dispensation period not to attend lectures to continue to participate in learning through online classes. Therefore, this study designed a learning management system as an online class at FIKK Unesa. The LMS framework used in this study is Moodle because it is based on research conducted by Kraleva et al. [7] revealed that Moodle is a free framework with the largest number of users supported by more than 100 interface languages fairly complete features.

This study aims to design and build a learning management system as an online class for student-athletes at FIKK Unesa. The urgency of this research is as a learning solution for student-athletes who are in a dispensation period not attending lectures to continue to follow online learning that is more flexible in time and place at FIKK Unesa. So, it is hoped that this research can improve the quality of academic learning for Unesa FIKK athlete students.

2 Methods

The method used in designing a learning management system as an online class in this study is waterfall. According to Togas et al., [8] the waterfall development model is a classic model that is systematic. The waterfall method has the advantage that the stages of the process are fixed, easy to apply and organized. Then it is suitable for products that have clear needs at the beginning, so that the minimum error is minimal. In addition, software developed with this method usually produces good quality [9]. The system development method uses the waterfall method as follows.

![Fig. 2. Waterfall model.](image-url)

### 2.1 Requirements analysis

At this stage, an analysis of system requirements is carried out. As much information as possible is needed so that it can be in accordance with the purpose. Data collection was
carried out by literature study and observation on the implementation of learning for Unesa FIKK athlete students who were in the dispensation period and did not attend lectures due to match preparation training. The information that has been obtained is processed and analyzed so that complete information is obtained about the specifications of the system that needs to be developed. At this stage, a user requirement document is produced which becomes a reference in designing and building a learning management system as an online class.

2.2 System design

At this stage, system design is carried out based on the results of system requirements analysis. System design aims to provide a complete picture of what must be done. It also assists system developers in preparing hardware for the creation of the overall software system architecture. The system modeling tools used are data flow diagrams, entity relationship diagrams and data structure and discussion. System design helps the system development process to be more directed and organized. It is also used to outline how business logic is covered in analysis to be implemented technically.

Coding. The writing stage is carried out by writing programs based on the system design that has been made. In this study using the Moodle LMS framework.

System testing. System testing is carried out to check whether the system is running properly and functioning as expected. The system will be tested for its ability and effectiveness so that deficiencies and weaknesses of the system are obtained which can then be reviewed to be improved into a better system.

Operation and maintenance. After testing is carried out and the system is declared to have passed the test, the system can be applied and during the implementation of the system, maintenance is needed so that the system can continue to be used.

3 Results and Discussion

Designing the Moodle learning management system for student-athletes at FIKK Unesa consists of several stages, namely:

3.1 Preliminary study

Interviews and questionnaires were conducted to analyze system requirements. At this stage, several system requirements are obtained which are shown in Table 1.

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online classes</td>
<td>Courses that can be done online are available</td>
</tr>
<tr>
<td>Material archive</td>
<td>All materials are saved</td>
</tr>
<tr>
<td>Online assignment</td>
<td>Online organized assignment and collection of tasks</td>
</tr>
<tr>
<td>Online tests and quizzes</td>
<td>Tests and quizzes can be done online</td>
</tr>
<tr>
<td>Grade and report</td>
<td>Student activity grading and reports can be done online</td>
</tr>
<tr>
<td>Announcements</td>
<td>All users can see the announcements</td>
</tr>
<tr>
<td>Online classes</td>
<td>Courses that can be done online are available</td>
</tr>
</tbody>
</table>
3.2 Development

LMS Moodle FIKK Unesa which is designed is divided into 4 types of users, namely: lecturers, students, class admins, and faculty admins shown in Figure 3. LMS Moodle FIKK Unesa can be accessed on the https://www.lms-atletfikk-unesa.my.id/ page. The start page is shown in Figure 4. After successfully logging in, the user will be directed to the home page in Figure 5. Development in accordance with the results of the needs analysis written in Table 1.

Fig. 3. Use case diagram.

Fig. 4. ‘Login’ page.
Course Menu. This menu is used to access online classes. Students or lecturers can use the menu to access the desired courses. This menu can be accessed on the main page by selecting one of the available course options. The display is shown in Figure 6.

Material Menu. This menu is used to access the material provided. This menu is in the course that has been selected, with a look like Figure 7.
Assignment Menu. This menu is used to access assigned tasks. This menu is in the course that has been selected. After all assignments are uploaded by students, the lecturer can assess them. Figure 8 is a display of task collection.

Fig. 7. ‘Materi’ page.

Fig. 8. ‘Assignment’ page.

Quiz. This menu is used to access the test or quiz given. This menu is in the course that has been selected. After the quiz is submitted, students can see their scores directly or can be assessed by lecturers. Figure 9 is the display of the quiz.
Grades menu. This menu can only be accessed by admins and lecturers. Lecturers can assess all assignments and quizzes given and see attendance scores. Display of menu grades as shown in Figure 10.

Announcements menu. This menu is used to see announcements that have been given by admins or lecturers. This menu can be accessed on the home page in the Latest announcements sub-menu then clicked the announcement option presented in Figure 11.
3.3 Testing

The testing phase is carried out to test whether the information system is running in accordance with its function [10]. Testing is done by testing each menu that has been developed. The test results are shown in Table 2.

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Information</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online classes</td>
<td>Courses that can be done online are available</td>
<td>Success</td>
</tr>
<tr>
<td>Material archive</td>
<td>All materials are saved</td>
<td>Success</td>
</tr>
<tr>
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4 Conclusion

LMS Moodle for student-athletes FIKK Unesa is designed, built, and can run and function as needed. The Moodle LMS provides learning that can be used to access materials, assignments, quizzes, grades, and announcements online. To improve effective and efficient services, it is necessary to evaluate users and improve the system based on evaluation.

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References

1. Universitas Negeri Surabaya, Simkatmawa 2021, UNESA Raih Peringkat 6 Nasional dan Berpredikat Unggul (Universitas Negeri Surabaya, Surabaya, 2021)
2. PPTI Unesa, “SIMPELMAWA : Sistem Pelaporan Prestasi Mahasiswa (Universitas Negeri Surabaya, Surabaya, 2023)


9. V. A. Kurniyanti, D. Murdiani, Jurnal Syntax Fusion 2, 8 (2022)

10. R. Rabiman, M. Nurtanto, N. Kholifah, Online Submission 9, 1 (2020)