

Learn from Home Application of Politeknik Negeri Padang Students during Covid 19 Pandemic

Hidra Amnur, Roni Putra, Andre Febrin Kasmar and Raemon Syaljumairi
Department of Information Technology, Politeknik Negeri Padang, Padang, Indonesia

Keywords: Covid-19, Android, Database, MySQL, Server, Moodle, Presence Information System, LMS, QR Code.

Abstract: The number of positive cases of the Corona or Covid-19 virus continues to grow. The existence of this epidemic has an impact on society, ranging from social and economic impacts to education in Indonesia. This was recognized by UNESCO on Thursday 5 March 2020, that the Corona virus outbreak had an impact on the education sector. Several campuses in Indonesia implement a distance learning policy, including the Politeknik Negeri Padang. Before the pandemic, lecture attendance was carried out with the Presence Information System. And lectures are carried out face-to-face in the class, laboratory or workshop. During the pandemic, the information system was no longer used and lectures were redirected using Moodle. Online lectures have several problems that arise, such as attendance, lecture schedules and the current student condition. This research was conducted by combining the Presence Information System database with Moodle which has similarities and adding several new fields to determine the condition of students with a questionnaire. To make it easier to use, an Android-based Learning from Home application was created and used by students.

1 INTRODUCTION

The Covid-19 pandemic has changed many things in the world of education. Access to online learning (e-learning) is now more important than ever. This change has been seen since the pandemic, due to health protocols that must be followed to prevent the spread of the virus.

Before Covid-19, one of the information systems in Politeknik Negeri Padang (PNP) was the Attendance Information System which aimed to manage lecturers, students, courses, classes, and attendance. This system is web-based with a MySQL database and is integrated with an attendance device using a card (RFID technology). This information system is very helpful in the management and reporting of lectures during normal conditions.

However, during the Covid 19 period the lecture model was no longer face-to-face in class, replaced by distance learning (eLearning). The Attendance Information System that was usually used before the Covid-19 is no longer used. The eLearning used by PNP is Moodle (<https://moodle.com>). The advantages of Moodle's LMS (Moodle, 2020) are:

1. Opensource
2. flexible learning

3. Mobile Learning,
4. Accessibility for All,
5. Security and Privacy,
6. Easy Integration.

PNP also uses JTSI (<https://jitsi.org/>) for video conferencing as a complement to lectures if you want face-to-face online.

The interesting thing about Moodle is Opensource and Easy Integration. Moodle is open source with advantages such as: Complete ownership, Give it your own look & feel, customize the functionality.

At Moodle there are various external platforms and services. Moodle can integrate with video conferencing for in-person meetings; Student Information System, plagiarism detection; portfolios, popular document suites, content repositories and thousands more. Moodle is a global learning management platform that supports open standards, and is interoperable by design to allow the integration of external information and applications into a single Moodle platform.

During student learning activities at home, there are several obstacles faced, including students and lecturers who are less disciplined with class schedules, and there is no control for student attendance during lectures. The lecturers' ignorance

of the student's condition, why students don't go to college, don't do assignments. The lecturer only guessed the condition of the students. In the Attendance Information System, there are ways to recap student attendance, class schedules, and lecture journals. Attendance can be seen by the administration department without the need for the lecturer to recap the attendance and give it.

The information system that already exists in PNP can certainly take advantage of this Moodle feature to be able to adjust and expand existing functions. The big question is how to integrate Moodle with the existing system in PNP.

Each system has advantages and disadvantages. If both are used, it will tend to be troublesome because the data that is filled in are basically almost the same. And it tends to cause input errors that result in data being filled in at Moodle not the same as the attendance information system. This error can result in detrimental to students or lecturers later. So this research contributes to finding how to integrate two different systems in one application by engineering the MySQL database

This Learning from Home application uses database tables that already exist in the PNP's Presence Information System and Moodle. To determine the condition of students, several questionnaire tables are added. This research is based on the Android and MySQL databases.

2 LITERATURE REVIEW

2.1 eLearning, LMS and Moodle

e-Learning is a distance learning that utilizes computer technology, computer networks and the internet. E-Learning makes it possible for learners to learn via computers in their places without having to physically leave follow lessons / lectures in class.

Software applications for managing documentation, reporting, automation, delivery of learning or educational materials, training programs are known as learning management systems (LMS). It acts as a centralized training platform that serves as the center of any learning ecosystem. LMS can manage learning content, audience and assess the performance of the audience

The first introduction of LMS occurred in the late 1990s. LMS is more focused on delivering online learning that can support a variety of users. LMS acts as an online content platform that can do classroom management, training, instructors, or vice versa which is usually done by schools or colleges. over

time, e-learning tools and features continue to evolve. The e-learning industry keeps abreast of trends, such as implementing VR, AI or other types of new technologies. It aims to bring flexibility, accessibility and convenience to its customers at a low cost, which will not have a drastic impact. Research shows that the LMS market is expected to pick up with a compound annual growth rate of 24% between 2016 and 2020. In 2020 the growth will continue to increase due to Covid-19 (Pappas, 2019).

Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalized learning environments. To be integrated with external systems, Moodle provides

1. External database authentication

This method uses an external database table to check if the username (which must be varchar) and password are valid. If a user is not currently on Moodle, a new account is created and their information copied from an external database.

Activating the External Database Authentication feature, can be done by logging into the Moodle administrator and accessing the site administration > Plugins > Authentication > External database. And check the external database authentication plugin.

There are 2 ways to use the External Database Authentication feature

a. Field Mappings

- Update Local - Specifies that the external data will be entered into the local field in question
- Update External - Specifies just the opposite, meaning changes in the local Moodle field in question will update the corresponding field in the external database
- Lock Value - Only determines whether the local user can make a change in the Moodle field and does not affect the two settings above.

b. Automatic Synchronization

A typical cron entry will be as follows:

```
0 * * * * /usr/bin/php
/path/to/moodle/auth/db/cli/sync_us
ers.php >dev/null
```

2. External database enrolment

External databases (of almost any type) can control registration. It is assumed that the external database contains a field that contains course IDs, a field that contains user IDs, and optionally a field that contains roles. It is compared with the fields

selected in the local course, the users table, and the roles table.

This script is meant to be called from a system cronjob to sync moodle enrolments with enrolments in the external database.

Example cron entry

```
# 5 minutes past 4am
5 4 * * * /usr/bin/php -c
/path/to/php.ini
/path/to/moodle/enrol/database/cli/sync.p
h p
```

MySQL is a database based on the client-server model. At the heart of MySQL is the MySQL server, which handles all database instructions (or commands). MySQL server is available as a separate program for use in a client-server network environment and as a library that can be embedded (or linked) into separate applications.

2.2 Android

Android is an open source platform software package that is based on the Linux operating system for mobile devices and allows anyone to download, customize, innovate and distribute so that people around the world can enjoy greater access to more information and opportunities.

The Learn from Home application uses the Android platform, because most lecturers and students use Android-based smartphones (Afdal and Hidra, 2020).

2.3 QR Code

External database for integration of academic information systems (SIA) with Moodle by preparing the SIA data structure as required by the External Database feature in Moodle. For external database authentication, the integration process is carried out every time a user logs in to Moodle, so that data can be integrated in real time. External database enrollment poses the integration is done by executing the file that has been prepared in the doodle on PHP CLI and it also takes a long time (so as not to overload the server, it is done once a day) (Bunyamin and Syazili, 2019).

2.4 Information System

An information system (IS) is a system designed to collect, process, store, and distribute information. One example of an information system is a presence

information system, a presence information system aims to manage the presence of an institution or company. The system is designed to collect a person's attendance data at any time which will be processed automatically according to the wishes or needs of the institution / company. The results will be distributed in the form of reports that have been processed from data that are related to the presence in the database.

2.5 Database and MySQL

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS).

A QR code (abbreviated from Quick Response code) is a type of matrix barcode (or two-dimensional barcode) first designed in 1994 for the automotive industry in Japan. A QR code consists of black squares arranged in a square grid on a white background, which can be read by an imaging device such as a camera, and processed using Reed–Solomon error correction until the image can be appropriately interpreted. The required data is then extracted from patterns that are present in both horizontal and vertical components of the image (Denso, 2011).

3 MATERIALS AND METHODS

The material used includes existing databases in the presence information system and Moodle. From the two databases, find the equation that intersects the two databases. Merge records from two relational databases and create a new database which will be created for the Moodle External Database and will be used for the API in application.

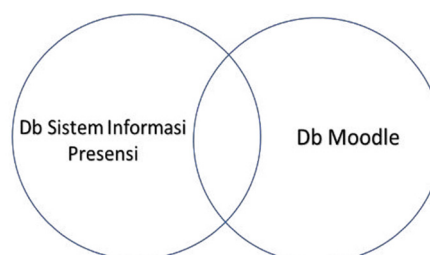


Figure 1: Database Relational.

In addition to the table above, it is added to determine the current condition of students. and for an overview of the application as follows:

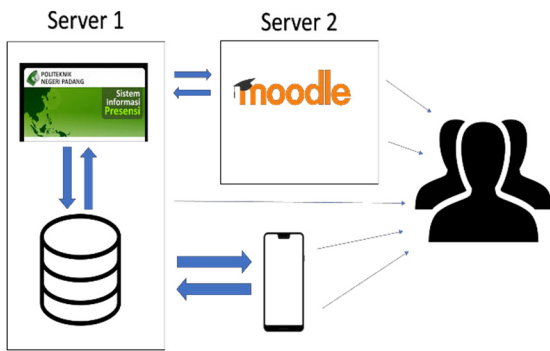


Figure 2: Overview of the application.

In Figure 2, it can be seen that there are 2 servers, one server for presence information systems and the second server for Moodle. The database and API of the Learn From Home Application are on the same server as the presence information system. The main users of the system and applications are Administrators, Lecturers and Students. They can directly access the Presence Information System or directly access Moodle. And they can also access it via the Learn from Home Application. Whatever they access the information and the data received will be the same. information from the operating system and applications used on the server can be seen in table 1

Table 1: The operating system and applications used on the server.

Server 1	Server 2
CentOS 7.6 x64	CentOS 7.6 x64
CWP7Pro, Apache 2.4.39, PHP 5.3, MySQL 10.1.43-MariaDB, Attendance Information System	CWP7Pro, Apache 2.4.39, PHP 7.2.19, MySQL 10.3.23-MariaDB, Moodle 3.9.1

4 RESULT

To implement the External Database, several steps are carried out such as:

1. Setting up a view in the database that provides student and lecturer data that can log in to Moodle, along with the profiles required by Moodle
2. Enabling the External Database feature
3. Setting the external database on the plugin
4. Mapping the Moodle system. This process aims to map the previously prepared fields to the table in Moodle

If external database enrollment has been configured, the administrator may choose to use those settings. This setting can be seen in the following figure:

Figure 3: External Database Configure.

Figure 4 is an additional table in the database related to the questionnaire to determine the student's condition.

Figure 4: Additional tables in the database.

Distance learning difficult to know the real state of the student. This additional table is needed as data or information to find out their situation in order to make it easier for lecturers or leaders to make the best decisions for them during this pandemic.

5 CONCLUSION

Integration of Moodle and Attendance Information Systems can be done by utilizing the External Database feature in Moodle. Similar tables are configured to sync. It is recommended to synchronize database contents with the main data on the Presence Information System, because the External Database feature is in Moodle. for further research, it can be developed in other tables in the Presence Information System and other information systems can also be carried out in the Padang State Polytechnic environment.

ACKNOWLEDGEMENTS

Thanks to Politeknik Negeri Padang and Information Technology Department for their support in this research. This research was sourced from the Politeknik Negeri Padang's DIPA funds for the 2020 fiscal year

REFERENCES

- Moodle. (2020). Key features of Moodle LMS. [Online]. Available: <https://moodle.com/lms/features/>.
- C. Pappas (2019). Top Learning Management System (LMS) Statistics For 2020 You Need To Know. Available: <https://elearningindustry.com/top-learning-management-system-lms-statistics-for-2020-infographic>. [Accessed: 01-Oct-2020].
- M. Bunyamin and A. Syazili. (2019). External Database Sebagai Media Integrasi Sistem Informasi Akademik dengan E-Learning. *J. Bina Komput.*, vol. 1, no. 1, pp. 73–81.
- Afdal and Hidra Amnur. (2020). MRAPAT Untuk Sistem Manajemen Ruangan Rapat, Absensi, dan Notulen di PT PLN Unit Wilayah Sumbar. *J. Ilm. Teknol. Sist. Inf.*, vol. 1, no. 2.
- Denso. (2011). *QR Code @ Essentials*. Denso ADC.