Student and Lecture Attendance on Moodle Elearning Based on Cloud Infrastructure

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Abstract

E-learning is a unit where there is collaboration with academics and IT unit. Here we develop several technologies that can assist academic administration, especially those closely related to the learning process and evaluation. Of course, this cannot happen without the support and tools from the IT Bureau, such as servers and web hosting, which are a place for the system we have developed. Moodle is the main application that is the main operation of e-learning at Widyatama University, but Moodle itself is not enough to solve higher education learning problems, especially at Widyatama University. The following are some of the main problems that are not a feature of Moodle itself so it needs developments that have been carried out by the elearning unit.

Keywords: component, formatting, style, styling, insert (key words)

INTRODUCTION

Questions that are commonly asked regarding the implementation of online lectures are related to attendance. By analogy, if classes are held face-to-face in class, lecturers and students will be present in class to carry out teaching and learning activities. Filling in attendance is done by filling out a folder brought by the lecturer and signed by the students and lecturers complete with the minutes of the lecture. However, in contrast to e-learning lectures, there is no map to be filled in and attendance is filled in by lecturers and lectures are fully carried out using internet media. The Moodle platform completely provides a variety of activities that can be used for online learning and is so complete that it is called an LMS (Learning Management System). Online activities carried out by lecturers and students include lecturers uploading modules, creating forum discussions and carrying out tasks or called Asyncronous Learning. Even synchronously, lecturers can make online meeting activities such as Google Meet and Zoom meetings. However, Moodle as an LMS itself has not provided a feature to evaluate what activities have been carried out by lecturers and students. Among the thousands of classes (approximately 2500 classes for this even semester) there could be empty activities or no resources filled by the lecturer. Therefore, monitoring is needed as legitimacy that the lectures have been carried out. Moodle does not provide a monitoring tool like this, namely monitoring in the form of any activities that have been carried out by the lecturer every week as a requirement for attendance. Lecturer attendance data is required by the academic bureau to be later deposited into the finance department to be calculated as an honorarium. Of

course, this data is very important and must be as accurate as possible because it is related to the honorarium of lecturers, lecturers who have carried out the lecture requirements properly are given the applicable honorarium and have not carried out lectures will not be given an honorarium until the lecture is carried out. In other hand, higher education also has limitation in their infrastructure such IT budget and administrative staff[1].

In addition to the above, there is a regulation that lecturers who do not attend class for 3 meetings will be replaced by other lecturers by the study program concerned. So if there are online lecture activities 3 times in a row the lecturer does not fill the activity, then in order to maintain the quality of lectures in the eyes of students, it is necessary to take action by the study program in the form of lecturer replacement. Moodle does not have a feature to monitor that the activity has been filled 3 times or not. In general, monitoring is done by humans by looking at each class manually. There are approximately 2500 classes so every week a staff has to look manually one by one to see the progress of online lecture activities.

On the other hand, students, lecturers and parents of students also need the development of their students in attending online lectures. Students, especially scholarship recipients, when conducting online lectures require a recap of their presence to be reported to the scholarship organizer as one of the conditions for disbursing scholarship funds. Non-scholarship students also need a transparent presence to see their performance in relation to the final grade they will get.

ELEARNING SYSTEM

A. *Problem formulation*

1) *E-learning activities include modules, forums, quizzes and assignments. How to detect the existence of these activities as an administrative requirement for lecturers' obligations that an e-learning class has been held?*

2) *Students attend lectures through e-learning. How to know that the student is present in each class and follows the activities made by the lecturer?*

3) *How do lecturers receive reports related to student attendance performance in online classes that are taught by them?*

4) *How do study programs or leaders know that there are vacant lectures for 3 consecutive meetings?*

5) *How can study programs or leaders receive performance reports regarding students and lecturers in conducting online lectures through Moodle?*

6) *How do students and their parents find out the attendance report of the student concerned.*

B. *Proposed solution*

Here we describe the solutions developed to help address the above problems. First, that to solve the problems above, special techniques in the IT and programming fields are needed. The technique we call intelligent systems or referred to as artificial intelligence. The second is to consider all the features available in Moodle itself, namely the existence of data. Therefore, an intelligent system for processing data is known as a scientific area called Data Science. Activities in Moodle are available in html tags, and each activity such as modules, forums and quizzes is distinguished by a different CSS structure. When viewed from the side of web development, a web developer can easily. The third is the existence of Moodle data logs which can be maximized. In-depth data science techniques are needed in processing log data because there is a certain level of complexity in processing Moodle log data. Moodle log data stores all activities in detail for both lecturers and students.

Listing Code sample of Lecture Attendance

```php
<?php
class manage_attd_dosen extends MX_Controller
{
        public function __construct()
        {
                parent::__construct();
                $this->load->library('session');
    $this->load->module('sesi');
    $this->sesi->cek_session();
                //$this->sesi->cek_dosen();
    //$this->sesi->cek_mhs();
    //$this->sesi->cek_role();
                $this->load->module('template');
    $this->load->model('attd_dosen_model');
    $this->load->model('attdn_mhs/attd_mhs_model');
    //echo 'test';
    //$dosen_id = $this->session->userdata('ukd');
                //$data_dosen = $this->attd_dosen_model->get_attd_dosen($dosen_id);
                //$data['dsn'] = $data_dosen;
    $this->cek_role();
        }

        function index()
        {
    redirect('home');

        }

  function course()
  {
    $dosenSlug = $this->uri->segment(4);
    $plotSlug = $this->uri->segment(5);

    if(!isset($dosenSlug) && !isset($plotSlug)){
      redirect('profile');
    }

                $dosen_id = $this->session->userdata('kode');
    $mhs_id = $this->session->userdata('kode');
                //$data_dosen = $this->attd_dosen_model->get_attd_dosen($dosen_id);
    $dosen_id = (string)$dosenSlug;
    $this->session->userdata('kode')!=$dosen_id  ?  redirect('profile')  :  $data_dosen  =  $this-
>attd_dosen_model->get_attd_dosen($dosen_id);

                $data_attdn                    =                    $this->attd_dosen_model-
>get_attd_byPlot($dosenSlug,$plotSlug);
                //var_dump($data_attdn);

    $data['fname'] = $this->session->userdata('fname');
    $data['lname'] = $this->session->userdata('lname');
    $data['uemail'] = $this->session->userdata('email');

                //$data['data_attdn'] = $data_attdn[0]['data_kehadiran'];
                $data['data_attdn'] = $data_attdn->data_kehadiran;
    $data['dsn'] = $data_dosen;
```

```
    $data_mhs = $this->attd_mhs_model->get_attd_mhs($mhs_id);
    $data['mhs'] = $data_mhs;

    $this->template->header($data);

            $this->load->view('index');
}
```

In the era of the industrial era 4.0, it is no longer strange to think that data is very valuable. Coupled with the increasingly widespread development of Big Data, a model is needed that is specifically made as a solution to existing problems. Therefore, with the facilities provided by IT such as hosting and servers, we maximize our programming capabilities to create an intelligent system as a solution to the problems described previously. Here are some brief points with regard to the proposed solution.

Scan data automatically from the intelligent system in its entirety to all courses available in Moodle (2500 courses). And present comprehensive, detailed data including the conditions for the presence of lecturer activities.

Perform data processing with Data Science techniques which are then packaged in the Intelligent System. The output is in the form of a website that can be accessed by lecturers and students transparently, as well as what criteria are required for student attendance automatically by the system.

a) Through the website provided by IT unit, namely at the address http://sisfo.elearning.widyatama.ac.id/ with programming development carried out by elearning and data updates carried out every week automatically operated by elearning.

b) E-learning provides a report to the study program in the form of a summary of any subject data that has not met the attendance rate of 3 times in a row. Sent by email. The study program also has access to a web application to view details of the existence of e-learning activities every week.

c) Through the website that has been prepared at the address http://sisfo.elearning.widyatama.ac.id/ the study program can see the display of student performance. In addition, e-learning sends data every week which contains students who have less attendance to each lecturer in the courses they teach via media messages on the Moodle application.

d) Parents of students can also see the same thing through the system we developed at http://sisfo.elearning.widyatama.ac.id/ to see the student's attendance. Student attendance based on cloud architecture wich allow users to store files remotely and synchronize and share them over multiple devices[2, 3].

C. **Implementation**

A. Intelligent system for Monitoring Lecturer Attendance

We developed an intelligent system where the information can be accessed at the address http://sisfo.elearning.widyatama.ac.id/accounts, login to that address with the account we have prepared.

The following is an example of a lecturer attendance display

Figure 1 Screenshot Application

The above application is information that is accessed every week by academic staff, useful for inputting lecturers' attendance to SISFO. However, we have also prepared accounts for each study program so that each study program can see the lecturer's performance in each course.

Figure 2 Screenshot Lecture Attendance

The display above shows the presence of reg A totaling 994 classes, with features
Detail view per meeting
Search based on the name of the Constitutional Court and the name of the lecturer
There is a link, if you click it it will go to the course or class in question
Complete identity information of who is the tutor of the course
Available attendance data reg A, B and post

The data in the application above is updated every week with details: REG A every Friday, REG B1 Saturday and REG B2 Sunday.

INTELLIGENT SYSTEM FOR MONITORING STUDENT ATTENDANCE

Higher education emergence new digital source inside digital environment called Big Data. Universities are involved in network of digital data technologies and a lot of technical term, some experts reimagined as 'smarter universities'[4]. To maintain transparency, here is some information about how this student attendance system was generated.

a) *Data source: Moodle log*

b) *Note that odd logs reach almost 1 M records with a size of 11 GB*

c) *Attendance is done by processing the large file very accurately by "slicing" the data according to the related course id.*

d) *Periodic snapshot of the log table with a time span of 2 weeks as written in the menu instructions on the "user", "time" and "course" dimensions.*

e) *Transformation of data into attendance tables according to the relevant participant courses.*

f) *Log processing utilizes the GPU based on the NVIDIA CUDA platform. Thus obtained the required speed in producing this presence system.*

Technology has similarities with fashion because if it is not updated, it will be increasingly abandoned. Therefore, this system will continue to develop, especially in order to improve the quality of learning.

Figure 3 Screenshot of Student attendace Application

All student attendance can be accessed on the Faculty menu, then select Study Program.

Figure 4 Menu Screenshot

Then select a course

Figure 5 Whole course menu

The information displayed on the website is always available for lecturers and students. Updates are carried out once a week with an online lecture time range of 2 weeks.

T a b l e   2

Sample Code of Student Attendance

```
stud = dfStud.drop_duplicates(subset=['userid'])
stud['npm'] = stud.firstname.apply(lambda x:    if '/' in x:
x.split('/')[1] # Avoid dead code: 'nan')
ready                                             =
np.hstack([stud[stud.userid.isin(a)].sort_values('userid',
ascending=True)[['firstname', 'lastname', 'npm']], mtx])
rdf = pd.DataFrame(ready)
rdf = rdf.rename(columns={0:'firstname',   1:'lastname',
2:'npm', 3:'pertemuan1', 4:'pertemuan2', 5:'pertemuan3',
6:'pertemuan4',      7:'pertemuan5',      8:'pertemuan6',
9:'pertemuan7',     10:'pertemuan8',     11:'pertemuan9',
12:'pertemuan10',  13:'pertemuan11',  14:'pertemuan12',
15:'pertemuan13',  16:'pertemuan14',  17:'pertemuan15',
18:'pertemuan16'})
```

CONCLUSION

Currently we are working with IT unit and academics to develop e-learning technology. Some of the things we have done involve IT unit and academics to provide the necessary data. We are currently doing modeling with machine learning to make predictions for students' final grades. We have a hypothesis that the number of student activities in online lectures or e-learning has a linear correlation with the final results achieved. From the IT and academic side, they have provided the necessary data, namely the alphabetical value of students, for the next stage it is processed in e-learning to create predictive models with machine learning techniques.

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