

## Creating Fukuoka Gakuen Moodle as a Tool for Video e-Learning

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#### ABSTRACT

In recent years, lower passing rates in the national dental exam and a reduced number of exam takers seeking entrance into private dental schools have led to lower quality entrants and disparities among those entrants. This requires more appropriate learning support than has been given in the past. For this study, we provided easy-to-use video content to create Fukuoka Gakuen Moodle, which provides this video content through a learning management system to support making the study of clinical practice courses more effective and efficient.

### INTRODUCTION

Moodle is an open source education management software package created based on the idea of social constructionism<sup>[1]</sup>, and can be used via not only personal computers, but also smartphones and tablets. In a University ICT Promotion Council survey of 516 universities across the nation, it was noted that 337 universities (65.3%) had implemented and were using a learning management system, with 125 universities (37.1%) using Moodle as the learning management system. This was a higher rate of implementation than other learning management systems<sup>[2]</sup>. Fukuoka Gakuen had already implemented and was using another learning management system; however, in addition to the cumbersome process for creating content, the process taken to eventually view content requires many clicks and is not easy to use. In recent years, university education has become more advanced and, based on the demands of students for more varied forms of learning, there is an increasing need for more effective and efficient education<sup>[3]</sup>. After Clark's 2001 report<sup>[4]</sup>, web-based e-learning has gradually come to be used in educational settings. Web-based e-learning uses not only visuals such as images and videos, but also enables learning through the browsing of educational materials and test formats. Gallagher et al. reported that web-based e-learning contributed to improvements in attitudes toward learning<sup>[5]</sup>. Thus, in this paper we provide an overview of Fukuoka Gakuen Moodle, which provides video content in

a learning management system, for the purpose of supporting effective and efficient learning in dentistry clinical practice courses.

## SUBJECTS AND METHODS

### System Composition

#### Overview

Fukuoka Gakuen Moodle runs on Windows Server and includes a RAID5 array for recovery from disk failure, as well as backup of all drives to external drives on a daily basis.

#### The construction of the server: physical server

OS : WindowsServer2012R2

CPU : Intel Xeon CPU 3.40GHz

Memory : 16GB (8GB×2)

Hard disk : 600GB (300GB×3 RAID5)

UPS : APC Smart-UPS 750 LCD 100V

#### Virtual server

Virtual software: Oracle VM Virtual Box

OS: CentOS 6.5

## RESULTS

### Creating Fukuoka Gakuen Moodle

When registering a user, a new Moodle ID and password are created, which requires management of the new ID and password by the user. The system administrator must issue and manage all user IDs and passwords. Therefore, to lighten the administration burden, Moodle was made to allow logins with single sign-on with Fukuoka Gakuen IDs and passwords managed on an LDAP server. In addition, by using the information from the LDAP server, user names were automatically registered without user input (no entry required). The system was further set up to grant course creation permissions to teachers, and general permissions to staff members and students.

In Moodle's default settings, user registration requires an e-mail address, and a confirmation e-mail is sent to the registered e-mail address, which provides a URL for users to click on and complete registration. However, in its current state, Moodle can only be accessed from a terminal connected to the school LAN, making it difficult for users without a terminal always connected to the school LAN to register. Therefore, the system was customized to not require an e-mail address during registration, and to do away with the need to send a confirmation e-mail to the user upon registration.

### Viewing of Explanatory Videos in Moodle via a Web Browser

Courses were created with a "single activity format" as the Moodle course format, and the activity type as a "database". Teachers were then able to easily upload explanatory videos, and students could then create environments that allowed them to freely view the content. However, the default functionality of the system was such that links to video files were created, upon which users could download the videos for viewing. Thus, Moodle's individual display template was edited and customized to allow playback of videos from within a web browser using HTML video tags. In addition, functionality was added to prevent video downloads in consideration of copyrights, etc.

#### Source for Individual Display Template

1. <div id="test" style="visibility: hidden">[[video file]]</div>
2. <video id="show\_douga" controls="" autoplay="" loop="" controlslist="nodownload" width="100%"></video>
3. <script src="//ajax.googleapis.com/ajax/libs/jquery/1.11.0/jquery.min.js"></script>
4. <script type="text/javascript">
5. var result = \$("#test a").attr("href");
6. \$('#show\_douga').attr({
7. 'src': result,
8. });
9. \$('video').on('contextmenu',function(e){

10. return false;

11. });

12. </script>

(2) Video tags <controlslist="nodownload"> prevent the downloading of videos.

(3) Reading of JQuery library.

(5) Replacement of video file path variable “result”. The video file is read with hidden attributes on the first line to acquire the video file path.

(6-8) The video file path is added to the src attributes in the video tag.

(9-11) Right-clicking of videos is prevented (as part of preventing video downloads).

### Viewing on Fukuoka Gakuen Moodle

A login information screen is shown when accessing Fukuoka Gakuen Moodle via a URL (Figure 1). The user ID and password is entered, and when the login button is pushed, the course selection screen appears (Figure 2). When the desired course is selected, a screen with a list of content for the selected course is displayed (Figure 3). A video viewing screens for the content to be viewed is displayed, and the user then views the video (Figure 4).

### Content Registration on Fukuoka Gakuen Moodle

As with the afore mentioned viewing time, when using a URL to access Fukuoka Gakuen Moodle a login information screen is displayed (Figure 1). The user ID and password is entered, and when the login button is pushed, the course selection screen appears (Figure 2). When the course to be registered is selected, a screen with a list of content for the selected course is displayed (Figure 3). Clicking on “Administration - Add Entry” on the bottom left-hand side of the screen displays a new entry screen (Figure 5). The new video to be registered is dragged and dropped to the area within the dotted line with the downward-pointing arrow, and necessary information is input, after which new registration is completed.

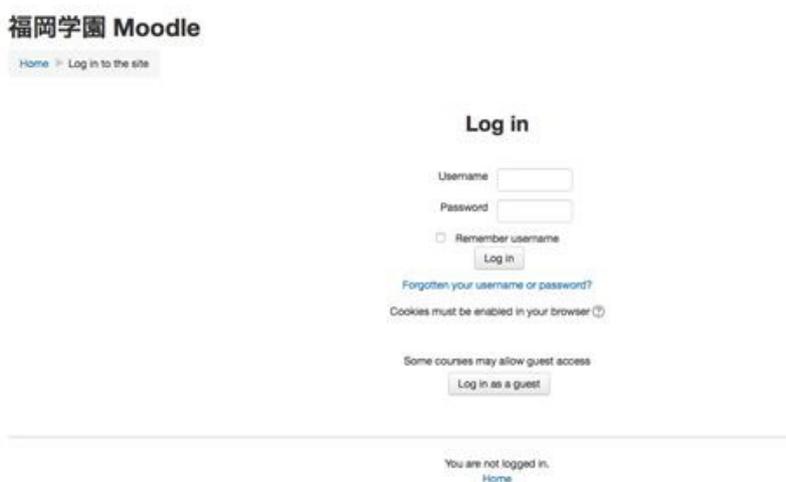


Figure 1. Login information screen.



Figure 2. Course select screen.



Figure 3. Contents select screen.



Figure 4. Viewing videos screen.



Figure 5. Upload of a video screen.

## DISCUSSION AND CONCLUSION

A learning management system had already been implemented at this school and was comprised of functionality for catalog searches in the information library, confirmation of attendance, an e-learning system, a lecture recording system, a clinical practice management system, and educational materials related to computer-based testing (CBT). The e-Learning system used at the school was web-based, though it was primarily limited to the viewing of Office files, educational materials in PDF format, and learning in test format. It had almost no video content. Thus, Fukuoka Gakuen Moodle was built to provide video content through a learning management system to support more effective and efficient learning in dentistry clinical practice courses. Content is

being gathered with an eye toward supporting learning clinical courses such as basic practice in 3<sup>rd</sup> and 4<sup>th</sup> year clinical courses, as well as for the Objective Structured Clinical Examination (OSCE) given at the end of the 4<sup>th</sup> year to measure basic examination skills and attitudes prior to beginning clinical practice.

In regard to learning support using e-learning, Kawai et al. [6] reported that their study suggested that 92.3% of students using it in general denture practice training understood the overall flow. Takashi et al. [7] reported a similar evaluation for 89.0% of the students in pediatric dentistry simulation training. In regard to the effectiveness of the use of video, Maruyama et al. [8] reported that a majority of students that had used multimedia educational materials in learning orthodontic basics had positive opinions of them. Boberick et al. [9] reported that 73.0% of those that used videos during pre-clinical restoration practice felt that doing so was effective. Takahashi et al. noted problems, such as qualitative requests to segment videos that were too long or to explain detailed operations, as well as requests for clinic-oriented videos [7].

With the ability for a student to learn at one's own pace regardless of time and location, e-Learning is a means of achieving effective and efficient education [10,11]. In order to make Fukuoka Gakuen Moodle an effective learning support tool in dentistry clinical practice courses, it will be necessary to further enrich content with a high impact on learning that allows students to be able to easily understand details.

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