



IMPLEMENTATION OF GRADUATE EXIT SURVEY USING MOODLE

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ABSTRACT

This paper offers the details of our experience in using and integrating Moodle into our learning system. Moodle is widely used as an alternative way of medium of instruction in UNITEN and it has the largest group of users within the College of Engineering (CoE). The primary discussion of this paper is to focus on utilizing two essential modules within Moodle, which is, the Questionnaire and Certificate modules. These modules were applied for the Final Year Project course in CoE for obtaining results from Graduate Exit Survey (GES) for graduating students. The application of these modules will be discussed and results are analyzed through data obtained before and after the implementation of the above mentioned modules.

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1. INTRODUCTION

The development of modern learning tools for education in the present time is fast evolving due to the demand of efficient and quality edification. The culture of educating and learning is no longer restricted to a piece of board and marker. As students are now easily connected to the world via internet and technology, they seek innovative ways of learning. Tertiary institutions play an important role in adapting to these changing trends, and to keep pace such that a sustainable

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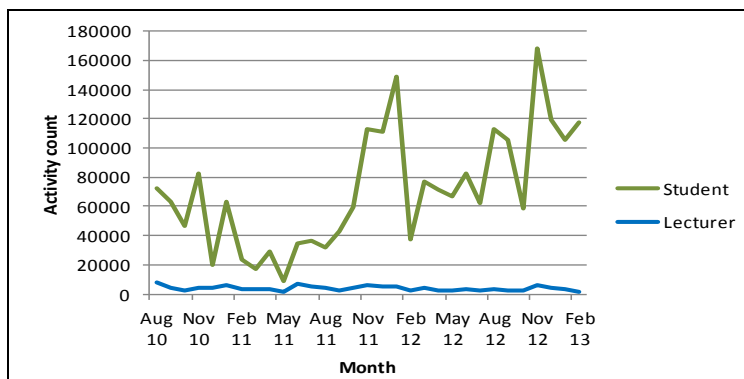
learning environment can be maintained. An “out-dated” institution deflates creativity and impedes growth in learning capabilities.

Good teaching and efficient assessment tools are crucial for every instructor and information technology is without a doubt an important means of supporting this need. There are already many tools that we could use out there, but none has a reliable e-learning platform. One of the most commonly adopted form of Learning Management System (LMS) which conform to standards and best practices by educational and corporate stakeholders is Moodle (Modular Object-oriented Dynamic Learning Environment) (Moodle, 2013). It is a free, open source software package that was designed using sound pedagogical principles. This modular platform provides flexibility in terms of possibility of customization. Moodle’s simple aim is to help educators create effective online learning communities (Dharmadhikari and Loni, 2010; Holbl *et al.*, 2011; Lei, 2011; Watanabe *et al.*, 2011).

At UNITEN, Moodle was first installed on an external server for use by the Electrical and Electronics Engineering Department in 2006. Its use was picked up quickly by staff and students. Thus, to expand to the entire college and to increase its security, Moodle was migrated into a local server inside the University in 2007. Workshops and trainings were periodically conducted within the campus and many were receptive and eager to use it. It solved one of the main problems of lecturers, which is to share their teaching materials with their students. Due to the popularity of Moodle, Moodle was extended to lecturers from other Colleges. The service was open to the entire University beginning late 2009. Figure 1 shows the continuous growth of online activity within Moodle since 2010. Moodle is not a compulsory LMS tool to use in UNITEN and usage is purely voluntary. Figure 2 shows a screen capture of the front page of the UNITEN’s Moodle site.

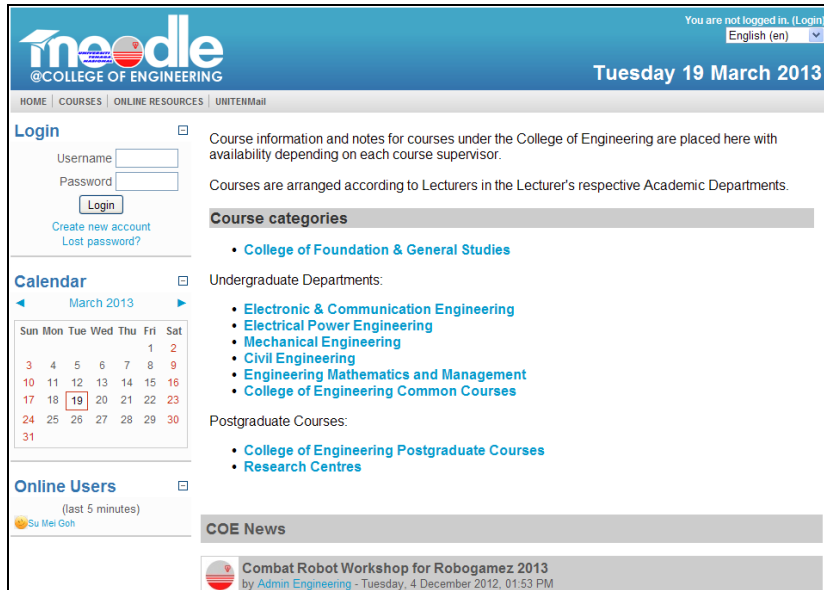
Since the first installed version of Moodle (version 1.5), the college has kept up with the most recent updates. This paper will discuss the work implemented in Moodle version 1.9+. Various modules were installed into Moodle according to requests by users. Among modules installed were slide show, media player, and presenter. Their use and requirement differ between courses and how each lecturer conducts his or her class. Here, we report one of the many positive results from the use of Moodle – improving the response rate of students-based Graduate Exit Surveys.

Figure-1. Activity chart of students and lecturers using Moodle



The rest of the paper is organized as follows. Section 2 explains the importance of Graduate Exit Surveys and the difficulties faced when using the traditional paper and pen method. In section 3, the *Questionnaire* and *Certificate* modules were adopted into CoE's Moodle. Section 4 presents the results and output and an analysis is given in Section 5. Finally, conclusions about the modules are made in Section 6, which also discusses the possibility of extending the modules for other purposes and further improving the learning process.

Figure-2. Screen capture of College of Engineering's Moodle Site



2. GRADUATE EXIT SURVEY (GES)

In outcomes-based education (OBE), Programme Outcomes (POs) are a series of statements that describe a set of predefined and specific attributes, skills or qualities that a graduate should have acquired and be able to perform upon graduation (Ungku Amirulddin *et al.*, 2009). In the CoE, the attainment of these POs are measured both directly and indirectly – directly via formal assessments such as final exams, tests and reports; while indirectly via surveys, questionnaires and informal feedback. Although direct measurement is often preferred as it leads to quantitative results, indirect measurement crucially complements the PO analysis by providing a different perspective. This gives a holistic measurement of students' achievements.

The CoE has been using the Graduate Exit Survey (GES) as part of the indirect measurement of POs attainment of graduating students. The GES is typically conducted for students who are at the final phase of Final Year Project (FYP) course. It measures the students' perception on how well they have achieved the POs of their respective degree programme. A scale of 1 to 5 is used to gauge whether they have acquired or attained the specific POs, with 1 being "strongly disagree" while 5 being "strongly agree".

Since its introduction in 2009, the GES was typically distributed to the students during the Oral Presentation session of the FYP, and students were required to complete the survey forms

during the presentation session. The response rate of the survey in Semester 1, 2009/10 was higher (77.6%, refer Figure 8) as compared to when the survey was first conducted in Semester 2, 2008/09 (31%). However, the response rate has been declining consistently since, as depicted in Figure 8. Two reasons have been believed to have contributed to the decline – i) some students did not complete the survey and/or submitted blank survey forms; ii) the completed survey forms were not passed back to the coordinator on-time for analysis.

To overcome this challenge, it was proposed that the GES is to be carried out electronically. The most convenient way to implement this was to host the electronic survey at the FYP course website in Moodle. To ensure students complete the survey, a unique yet personalized response slip was envisaged to be auto-generated at the end of the survey. Students are then required to submit the response slip together with their hard-bound theses as proof of compliance. Below we detail our work in implementing the electronic GES in Moodle and present the outcome of the implementation.

3. IMPLEMENTATION OF MOODLE MODULES

To overcome our problem, we have chosen the *Questionnaire* and *Certificate* modules for our implementation in Moodle. These two modules are set to work hand-in-hand; the *Questionnaire* module provides the platform for students to perform the GES while the *Certificate* module serves as evidence for the completion of the GES. Although there was another *Survey* module which is available by default in Moodle, we did not use it due to its limited functionalities and lack of customization for our purpose. The *Questionnaire* module, on the other hand, lacks in providing a personalized confirmation slip upon completion of the survey. We use this confirmation slip as a way to ensure students fulfil their obligation. Students are required to submit this confirmation/response slip along with their hard-bound Final Year Project Thesis as proof of compliance. Thus, the need for the *Certificate* module.

3.1. Questionnaire Module

In the *Questionnaire* module, we created the GES which consists of 14 questions with various types of questioning, i.e. check boxes, date box, dropdown choices, essay box, numeric, radio buttons, scale and text boxes. We could also place page breaks and labels in the questionnaire. The students are generally asked to answer questions about course and program outcomes (COs and POs), overall satisfaction, future plans in career and suggestions for improving the FYP course. In order to alleviate the monitoring process by various course coordinators, we created four questionnaires with similar questions for four major engineering departments, i.e. Electronics and Communication (EC), Mechanical (ME), Civil (CE) and Electrical Power (EP). The students were expected to fill out the questionnaire within a certain time frame, failing which, they are not able to submit their hard-bound FYP thesis. Figure 3 gives a snapshot of the questionnaire which was designed for the graduating students.

Figure-3. A snapshot of the Graduate Exit Survey (GES)

Part B: Graduate Exit Survey (Programme Outcomes - PO)

Programme outcomes are statements describing knowledge, skills, behaviours, and abilities which should be acquired by students upon graduation.

7 How satisfied are you on your current achievement in each programme outcome?

Rate your satisfaction level by using the scale: 1 (very dissatisfied), 2 (dissatisfied), 3 (neutral), 4 (satisfied) and 5 (very satisfied). Check N/A if not relevant to you.

	1	2	3	4	5	N/A
PO1 - Acquire and understand fundamental knowledge of mathematics, science and electrical engineering principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO2 - Apply engineering principles in solving problems relevant to electrical engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO3 - Analyze electrical engineering related problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO4 - Apply critical thinking in designing and evaluating components, processes and systems related to electrical engineering	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO5 - Comprehend the principles of sustainable development	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO6 - Comprehend professional and ethical responsibilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO7 - Apply engineering tools and techniques to conduct engineering design/experiments as well as to analyse data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO8 - Communicate effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO9 - Function effectively as a team member as well as a leader	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO10 - Appreciate the social, cultural, global and environmental responsibilities of a professional engineer with awareness of contemporary issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PO11 - Acknowledge the need for, and be able to engage in life-long learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8 Please write other comments, suggestions or recommendation for your achievements:

3.2. Certificate Module

A Certificate module is a customizable plugin module in Moodle that typically creates PDF certificates for students who have completed a course or a certain activity. However, issuing a “certificate of appreciation” was not appropriate for answering a questionnaire like ours. In that respect, the module had to be modified such that the layout of the certificate looks more like a response slip.

First, we installed and set up the module in Moodle. Specific settings must be made in order to link the Certificate module with an activity, which in this case, is our questionnaire (GES). This can be done in the “Locking Options” under “Linked Activity” (refer Figure 5). Other settings can be made here such as saving the certificates which are very important for backing-up data. If all settings have been done accordingly, a response slip (from Certificate module) will only be issued and available for viewing or printing once the GES (from Questionnaire module) has been successfully submitted online.

Every response slip is generated with a completely unique identification code, so there would be no duplication in issuance. The “Response Slip ID” which was uniquely generated at the end of the slip was done by enabling the “Print Code” option in Figure 4. In order to customize the response slip to tailor to our needs, we made considerable changes to the settings as the module was typically meant for certificates. For instance, we removed borders, image, logos, etc. This was done by disabling some design options as depicted in Figure 4. In addition, text options settings were also modified to suit our purpose. This will then give the appearance of the response slip. See Figure 6 for a sample of the response slip.

Figure-4. Text and design options in certificate settings

The screenshot displays two sections of certificate settings. The 'Issue Options' section includes: 'Email Teachers' (No), 'Email Others' (empty text box), 'Delivery' (Open in new window), and 'Save Certificates' (Yes). The 'Locking Options' section includes: 'Required course grade' (No), 'Minimum required minutes in course' (0), and 'Dependent activities' with two entries: '1 Questionnaire: ECRB424 FYP2 Graduate Exit Survey' (No) and '2 -- none --' (No). An 'Add another linked activity option' button is located at the bottom of the Locking Options section.

Figure-5. Issue and locking options in certificate settings

The screenshot displays two sections of certificate settings. The 'Text Options' section includes: 'Print Date' (Date Received), 'Date Format' (January 1, 2000), 'Print Code' (Yes), 'Print Grade' (No), 'Grade Format' (Percentage Grade), 'Print Outcome' (No), 'Print Credit Hours' (empty text box), 'Print Teacher Name(s)' (No), and 'Custom Text' (Thank you for your response. Please print this response slip and submit it to the COE admin at BN - Ground Floor by 29th January 2013, 4:00pm). The 'Design Options' section includes: 'Certificate Type' (Landscape), 'Border Image' (No), 'Border Lines' (No), 'Watermark Image' (No), 'Signature Image' (No), and 'Seal or Logo Image' (No).

Figure-6. Sample of a Response Slip

The image shows a response slip from Universitas Padjadjaran. At the top center is the university's logo, which consists of a red circle with a white crescent and star, and the text 'UNIVERSITY PADJADJARAN' below it. The main text of the slip reads: 'This is to confirm that **Muhammad Ikhwanudin Baharudin** ECRB424 has completed the FYP2 End-of-Course and the Graduate Exit Survey on January 23, 2013'. Below this, there is a thank you message: 'Thank you for your response. Please print this response slip and submit it to the COE admin at BN - Ground Floor by 29th January 2013, 4:00pm.' A horizontal line separates the main text from a section titled 'FOR OFFICE USE ONLY / UNTUK KEGUNAAN PEJABAT SAHAJA'. Under this section, there are three checkboxes with corresponding text: 1. 2 copies of hard-bound thesis. 2. 1 CD containing soft-copies of: -1 project proposal -Progress reports 1, 2, 3 -Oral presentation slides -Thesis. 3. Signed Letter of Approval. At the bottom, there are two fields: 'Date Received:' and 'Response Slip ID: ftzj5Wuk3E'.

4. RESULTS AND DISCUSSION

The questionnaire provided us a quick statistical analysis of the results. We could view all responses as a whole or individual response if required. A sample analysis is shown in Figure 7. Detailed analysis can be done by downloading the data in *.txt* format which can be imported into the MS Excel format.

More importantly, our implementation in Moodle resulted in a vast improvement of response rate, hence giving a more representative analysis of the GES. Figure 8 shows the response rate of the GES over a period of semesters. The bar charts which run from Semester 2, 2008/09 through Semester 1, 2010/11 show the percentage of respondents using manual forms. The highest number of contributors using manual forms was from Semester 1, 2009/10 (77.61%), which is not a very satisfying collection. After the implementation of the questionnaire using Moodle, there are striking improvements in the number of respondents from Semester 2, 2010/11 onwards. We even received a 100% response rate for the recent last three semesters. We are very pleased with the outcome and hope to see the continuance of this trend for many semesters to come.

5. CONCLUSION

Indirect measurements of PO attainments using surveys often face the challenge of not getting enough response needed for a thorough analysis. The *Questionnaire* module was found to be an effective tool in obtaining quick results in targeting a specific investigation, such as our Graduate Exit Survey (GES). By integrating the *Questionnaire* module and the *Certificate* module, we could ensure that we get an almost 100% participation in every semester. We highlight that the GES is conducted anonymously; although the response slips/certificates are personalized and unique, they do not explicitly divulge the identity of the respondents within the *Questionnaire* module.

Figure-7. Sample analysis of results from the Graduate Exit Survey

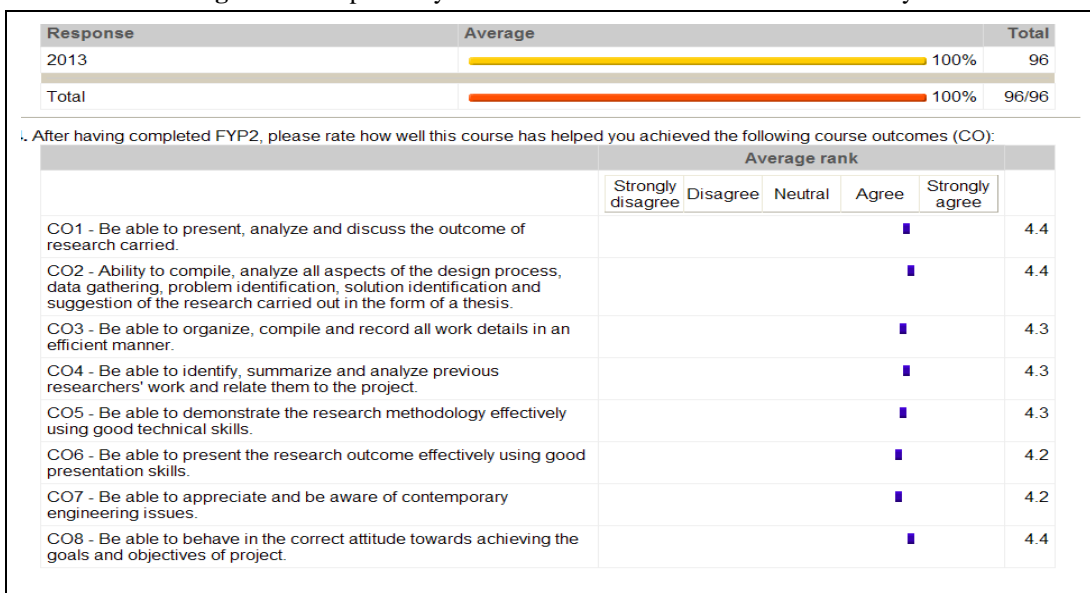
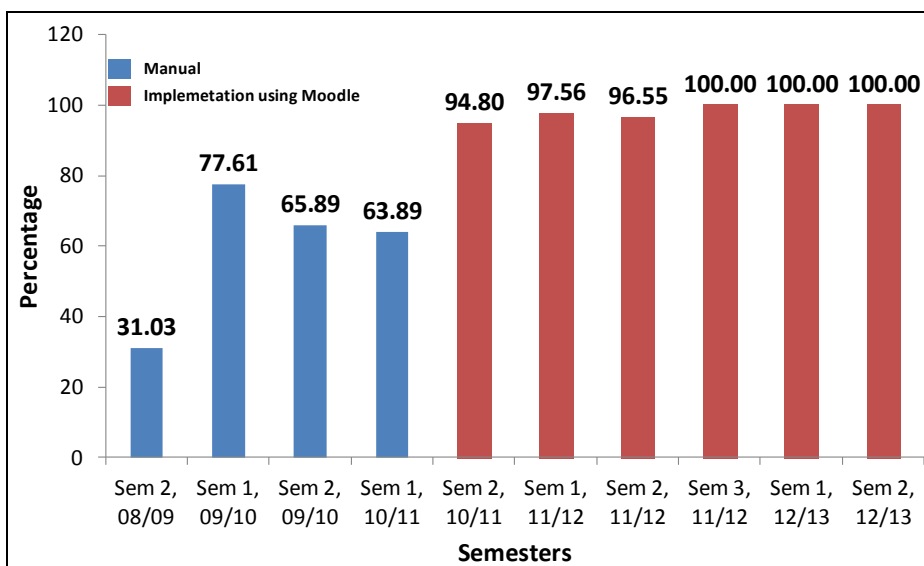


Figure-8. Improvement in response rate of the Graduate Exit Survey over a period of semesters



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