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Evaluation of Moodle Features at Kajaani University of Applied Sciences – Case Study

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Abstract

The aim of this study is to examine the Moodle features that are implemented in the Moodle version used at Kajaani University of Applied Sciences. Using the qualitative weight and sum (QWS) approach, a sample of 30 university lecturers were surveyed on their responses to Moodle usage. The paper intended to discover what features are mostly adapted and used by the lecturers. The Moodle learning management system implemented at KAMK includes 12 features for creating activities and six features for adding resources that are investigated in the paper. The measurement criteria of the Moodle features in the paper are considered subjective and qualitative. The author used 6 symbols for 6 qualitative levels of importance for the weights of features: E = essential, * = extremely valuable, # = very valuable, + = valuable, | = marginally valuable and 0 = not valuable. The result of the evaluation shows that Moodle is generally used for delivering course content, course progression plan, grading, creating activities, collecting course feedback and communicating with course participants. Among several features, only a few of them such as assignment, feedback, quiz and workshop modules are considered very essential and are heavily used.

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1. Introduction

E-learning plays an important role in learning process. It facilitates in acquisition and distribution of knowledge by the means of electronic devices ¹. Several universities and educational institutions around the world are adapting e-learning environment as their major teaching and training tool. It complements to the conventional classroom teaching methods ². Learning management systems are complex applications that offers tools to aid in the delivery of online courses ³.

E-learning platforms have greater impact in teaching and learning methods in higher educational institutions. The past few years have brought advancement and growth in terms of using learning management systems (LMS) and online education. The availability of open source learning platforms and their ease of customization have increased the usage of E-learning platform ⁴. The integration of LMS has forced to redesign strategies and curriculum. The successful implementation of information and communication technology in education makes education accessible to a larger audience without time and space barriers ⁵.

Several learning management systems both commercial and open source such as Docebo, Moodle and Canvas are available today. Moodle is one of the most popular open-source learning platform with a huge number of implementation. It has 80,364 registered sites in over 235 countries. It hosts 12,380,436 courses and has 105,100, 7222 users. A majority of universities, universities of applied sciences, educational institutions, and vocational schools in Finland has implemented Moodle ⁶.

Learning management system in this research work refers to Moodle Learning Platform. According to moodle.org, Moodle is an open source-learning platform for creating personalized learning environment. It provides flexible tools to support both blended and online learning ⁷. The Moodle platform implemented at Kajaani University of Applied Sciences, Finland (KAMK) is customized in several ways to fit educational needs for delivering regular courses, 100% online courses as well as to support blended learning. KAMK practices a learning paradigm that utilizes the advantages of e-learning. It seamlessly integrates the modern ubiquitous ICT means into traditional courses to supplement traditional learning and encourage self-learning behavior of students. Blended learning is an optimal solution for course delivery. It is the combination of traditional face-to-face classroom teaching and e-learning ⁸.

KAMK is a university of applied sciences located in Kajaani, Finland. It was established in 1992 and has 5 faculties: Engineering, Information Systems, Business, Tourism and Sports and Health. KAMK has 2000 students and 235 staff members. It delivers 9 bachelor degree programmes in Finnish, 3 bachelor programmes in English and 5 Master's programmes in Finnish. It is one of the best universities of applied sciences in Finland for several years and running ⁹.

This paper presents an evaluation of Moodle features: activities and resources by university lecturers and teaching staffs at KAMK and main purpose for using Moodle learning management system. Activities in Moodle refers to a group of features in a Moodle course, generally an activity that students will conduct. The standard Moodle 2.4 includes 14 different types of activities: assignments, chat, choice, database, external tool, feedback, glossary, lesson, quiz, scorm, survey wiki and workshop ¹⁰. The customized Moodle version for KAMK includes 12 different types of activities: assignment, choice, database, feedback, forum, glossary, lesson, quiz, scorm package, survey, wiki and workshop.

The **assignment** module allows creating an activity in the form of an assignment. Students can submit assignment that can be a digital file such as word processing document, images, spreadsheet or audio video clips. Students can also submit assignment alternatively by typing text directly into the text editor. The assignment can have a flexible or a strict deadline as configured by the lecturer. Lecturer can review assignments, grade them numerically or using a custom scale, leave comment or feedback and upload files with corrections. The grade for each assignment is recorded in the gradebook.

The **choice** module enables lecturer to ask a single question with possible responses. A lecturer can create a quick poll for checking students' understanding to facilitate decision making on certain aspects related to the course. The choice results can be published after a certain date if required with student names or anonymously.

Database activity allows creating, searching and maintaining records or entries. The structure of entries are pre-defined and can include radio button, checkbox, dropdown menu, picture, text area or uploaded file. The visual layout of information is created by utilizing a database template. Database entries can be imported or exported and shared between courses. For example, a lecturer can use a database entry for creating a collaborative collection of books, journal, references or web links.

The **feedback** activity module allows creating a custom survey by using a variety of questions. Responses may be collected anonymously and shown to all participants if required. KAMK uses this feature and has a standard template for collecting feedback on Moodle courses.

The **forum** activity module allows adding discussion topics for participants to conduct asynchronous discussion. Several forum types are available to select from: a standard forum where anyone can initiate any discussion at any time or question and answer forum where students first need to post answer to be able to view other students' posts. Forms posts may be rated by teachers or by course participants.

The **glossary** module enables lecturers to create and maintain a list of definitions like a dictionary. It has several uses such as a collaborative repository of key terms, a list of revision resources and for sharing useful images, videos or sound files.

The **lesson** activity module provides flexible ways of delivering educational content or activities. A lecturer can construct content pages with varieties of options and paths for learners. It can include multiple choice questions, short answers or match making. The lesson can also be graded and navigated between pages and activities depending on how it has been designed by the lecturer.

Quiz is an activity module for creating quizzes that comprises multiple-choice questions, short-answers, matching and numerical. Quizzes are marked automatically and the grade is recorded in the gradebook. A quiz can allow single or multiple attempts. It can be used as course exams or a mini test at the end of a lesson.

The **scorm** package module is useful for presenting animations and multimedia content. It is simply a collection of files that are packaged as per the agreed standard. The **survey** module provides standard survey instruments for assessing and stimulating learning in online environments. It is used for collecting data and self-assessment. The **wiki** module allows adding and editing a collection of web pages that can be edited in groups or individually. The history of revisions for each pages are recorded. The **workshop** module is suitable for collecting, reviewing and peer-assessing students' work. The workshop allows submission of any digital content with the possibility of typing text using the text editor. Submissions are then assessed by completing an assessment form as defined by the lecturer.

Resources in Moodle refer to any item such as a powerpoint file, word documents, links that a lecturer can use to support learning. Lecturers can add different types of resources to a Moodle course. The standard Moodle version includes book, file, folder, IMS content package, label, page and URL as options for adding resources¹¹. The Moodle learning platform implemented at KAMK includes book, file, folder, label, page and url as resource options.

The **book** resource module is used for creating a book like multi-page resource that has chapters and sub chapters. Books can contain any digital content such as media files or text. It is useful for displaying lengthy passages by breaking down the text into several chapters or sub chapters. The common uses of book module are for displaying reading material, a handbook or a showcase portfolio of student work.

The **file** resource module allows lecturer to add a file as a course resource. The file can include supported file formats such as pdf or word documents. Students are required to have an appropriate software on their computers to open the file. It is generally used for sharing presentation files or draft files of certain programs. The folder module allows displaying a list of related files inside a single folder that reduces scrolling on the course page.

Labels can improve the appearance of a course page by allowing insertion of multimedia or text into the course page. It is used for splitting long list of activities, displaying and embedded video or sound file directly on the course page or adding a short description for a course section. The **page** module allows creating web page resource by using a text editor. The page can include text, images, sound, web links, videos or embedded code. The pages are more accessible than the file module and are easier to update. The **URL** module allows teachers to add web links as course resources. Multiple display options for the URL are available such as URL opening in a new window or embedded.

It is essential to design e-learning courses in an efficient way. The course should match students' needs and desires and adapt during course progression. The functionality of the platform and knowledge of available features play significant role in developing an efficient course. As explained above, several features are available for use in the Moodle LMS however there is a little research done in evaluating these features. Majority of the research works are focused in evaluating the learning platform but not features that are crucial in developing an effective course. Therefore, this research work focuses on evaluating Moodle features by university lecturers and teaching staffs. The main research questions are:

- What is the major purpose of using Moodle LMS?
- What features are available for lecturers to create an activity in a Moodle course?
- What features are available for lecturers to add resources in a Moodle course?
- Which of these above mentioned features are more essential and heavily used by lecturers?

2. Methods

The Qualitative weight and sum (QWS) approach is used to evaluate Moodle features. For this purpose, a questionnaire was designed and sent to lecturers and teaching staffs at KAMK. The lecturers and teaching staffs were from different faculties namely Information Systems, Tourism and Sports, Mechanical and Mining, Business and Innovations, Health, AIKOPA and others. The evaluation criteria in this research work focuses on the feature aspects for adding resources and creating activity in the Moodle LMS. The questionnaire included questions in three categories. The first category included general questions such as teaching experience, faculty of the respondent, Moodle experience in number of years and the major purpose for using Moodle LMS. The second category included questions to evaluate Moodle features for adding activities such as an assignment and quizzes. The third category included question for evaluating features that are available for adding resources to a Moodle course.

QWS is a well-established approach for evaluating software products. The weight of a criterion determines the range of values to measure¹². The measurement criteria of the Moodle features are mainly subjective and qualitative. I used 6 symbols for 6 qualitative levels of importance for the weights: E = essential, * = extremely valuable, # = very valuable, + = valuable, | = marginally valuable and 0 = not valuable. In QWS approach, each criterion has a maximum value. A participant can score on the value scale from no value 0 up to the maximum E¹³.

Figure 1 shows the distribution of participants among different faculties in KAMK, participants' teaching experience and experience in using Moodle. More than 70% of the respondents have teaching experience of 5 years or more while 50% of the respondents have been using Moodle for over 5 years.

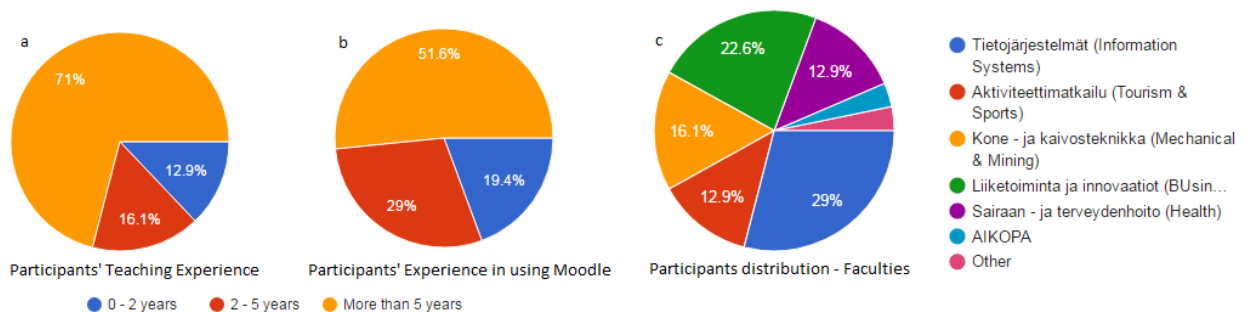


Fig. 1. (a) Participants' teaching experience; (b) Participants' experience in using Moodle; (c) Participants distribution among faculties

The feature usage is calculated by transforming multi-criteria task into one criterion task. The usage of each feature is calculated by adding the sum of all criteria together with their weights and is subtracted from the criteria "not valuable". A simple equation is derived to calculate the usage of each feature:

$$P = (\sum_{i=1}^n x_i - y) / 30 * 100 \%$$

P is percentage of usage of a feature, x is the weighted values: marginally valuable, valuable, very valuable, extremely valuable and essential for feature as in Table 1. y is the weighted value: not valuable.

3. Results & Discussions

The Moodle LMS in KAMK hosts over 1000 courses. Most of the courses are offered as regular courses through contact lessons while only 10% of them are offered completely online. Approximately 90% of the respondents reported that they use Moodle for disseminating course related materials and relevant resources. 30% of them are using as a tool to track the students' progress in a course. 25.8% lecturers use it as a channel of communication with course participants. 61% create assignment and grade them in Moodle. The main purpose for using Moodle LMS is summarized in the bar chart below:

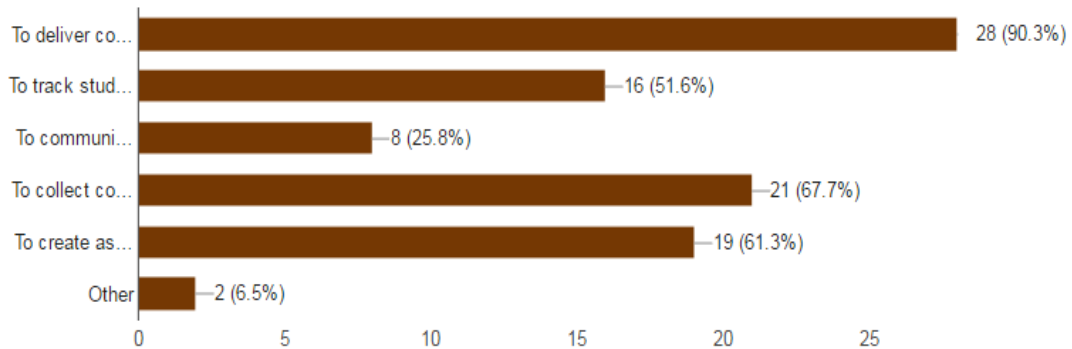


Fig. 2. Main purpose for using Moodle LMS

Table 1 shows the results for each activity type. The best results of each features are highlighted. Assignment activity dominates the evaluation by achieving the best value 9 times while the scorm package activity is identified as the least valuable activity feature by achieving the worst value 16 times. Other activity features such as choice, database, glossary, survey, wiki and workshop are considered least valuable. Feedback, forum, lesson, quiz and workshop are found to be extremely valuable features.

The file adding feature under Resources in Moodle dominates the evaluation by achieving the best value 14 times. The URL adding feature achieved the best value 13 times. The book module is evaluated as not valuable by 7 participant while the other 7 find it extremely essential. Approximately, half of the respondents used folder, label and page modules.

Table 1: Moodle feature evaluation

Features: Activity	0 = not valuable	= marginally valuable	+ = valuable	# = very valuable	* = extremely valuable	E = essential
Assignment	2	2	1	5	11	9
Choice	8	6	6	6	4	0
Database	9	1	5	6	6	3
Feedback	1	2	4	8	9	6
Forum	5	6	4	7	8	0
Glossary	8	5	7	7	3	0
Lesson	5	3	7	5	6	4
Quiz	5	2	8	4	7	4
Scorm	16	2	3	7	2	0
Survey	10	6	9	4	1	0
Wiki	8	8	6	6	1	1

Workshop	8	8	1	9	4	0
Book	7	0	4	8	4	7
File	0	0	3	3	10	14
Folder	3	2	3	5	8	9
Label	7	2	3	7	4	7
Page	3	2	7	6	6	6
URL	2	1	5	4	5	13

The usage percentage of each studied feature is presented in Table 2. Assignment, feedback, forum, lesson and quiz are heavily used by the participants. The feedback module that has a standard questions for collecting course feedback is the most used module while the scorm package is least used. File resource adding module is used by all participants. Folder, page and URL module are other heavily used features.

Table 2. Moodle Feature Usage

Features (Activity)	Usage (%)	Features (Activity)	Usage (%)	Features (Resources)	Usage (%)
Assignment	86.66	Lesson	83.33	Book	76.66
Choice	73.33	Quiz	83.33	File	100
Database	70.00	Scorm	46.66	Folder	90
Feedback	96.66	Survey	66.66	Label	76.66
Forum	83.33	Wiki	73.33	Page	90
Glossary	73.33	Workshop	73.33	URL	93.33

4. Conclusion

The Moodle learning platform at Kajaani UAS offers a huge number of courses to students. The Moodle LMS is customized and has several features available for teachers to assist them in teaching. The LMS is generally used for delivering course content, course progression plan, grading, creating activities, collecting course feedback and communicating with course participants. Among several features, only a few of them such as assignment, feedback, quiz and workshop modules are considered very essential and are heavily used.

E-learning tools complement to the conventional classroom teaching methods². The research work also discovered Moodle LMS to complement the conventional classroom teaching methods as majority of the courses hosted in Moodle at KAMK are intended for classroom teaching with a possibility for distance education.

Moodle offers adaptivity capabilities that is a user can customize his own course as per requirements and ease of using features. It offers customizable adaptation to lecturers that does not require any programming skills¹⁴. This was reflected in the result with lecturers belonging to different faculties customizing their courses by using several features as per their need.

The technology acceptance model (TAM) describes perceived usefulness and perceived ease of use as facilitating conditions for using a certain tool or a feature⁵. The lecturers' intention to use certain features in the Moodle platform depend on how they perceive its usefulness, ease of use and their pedagogical requirements. Majority of the lecturers used the platform for delivering course content, getting feedbacks, creating quizzes and workshops as they considered these features easy to use and extremely important from pedagogical point of view.

5. Limitations & Future Research Implications

This study is limited only to lecturers' perceptions with fewer participants. The scope of the analysis is limited to adding resources and creating activities features. The little prior research on the area especially in the usage of features offered in learning platform system provides an important opportunity to identify new factors such as computer anxiety, perceived trust and managerial and technical support and their impact on using certain features for future research work.

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