

A Pedagogical Evaluation of Moodle Extensions

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There has been a shift by the Australasian tertiary education sector towards open source Learning Management Systems (LMSs), in part due to the potential for extending and tailoring the systems using community sourced plugins. This paper reports on a comprehensive and systematic evaluation of Moodle extensions based on a six-month cross-faculty project conducted at Macquarie University. Findings included that despite over several hundred plugins and patches being uploaded to the Moodle Community website, the reference group only deemed nine of these as suitable for extending the functionality of the University LMS. The paper also describes the process and instruments that were utilised to evaluate the extensions themselves, which could be of interest to others making decisions about how best to balance the flexibility afforded by open source environment with extensibility within the constraints of complex and diverse institutional needs.

Keywords: Evaluation, Moodle, Extensions, Plugins, Learning Management System

Introduction

In 2010, Macquarie University made the strategic decision to move to Moodle as their Learning Management System (LMS), partly due to the flexibility afforded by an open source license which permits free use, adaptation and restructure of the software (Dougiamas & Taylor, 2003). This flexibility, along with the social constructivist philosophy behind the design of Moodle has contributed to its rapid rate of adoption in the higher education sector (Andrews & Daly, 2008). However, taking advantage of the flexibility to incorporate these features into the LMS poses challenges for institutions. The currently available literature offers a wealth of information about the contribution of LMSs to education but there are still some areas about which little is known. For example, while other studies (Weaver, Nair, & Spratt, 2005) confirm that many teaching staff are primarily focussed on the technical and administrative aspects of using the LMS, what of the affordances of the newer tools to enhance student learning through providing for more diverse learning experiences, timely feedback and positive interaction with staff and peers? When new extensions are developed to further these pedagogical aims .in an open source community where each institution's instance of Moodle is unique, how are new additions and adaptations to be evaluated and selected for sustainability as new versions of the LMS are released?

The aim of this project was to assess a range of extensions for their pedagogical value within Macquarie University's new LMS and to inform selection and adoption of extensions. While the standard version of Moodle comes with a range of valuable features, one of the key advantages of the open-source LMS is the ability to download and install a range of extra modules and extensions that have been developed by educators and technology enthusiasts from around the world. At the time of performing the review (July 2011 to February 2012) there were over seven hundred Moodle extensions that had been uploaded to the Moodle community website (<http://moodle.org/mod/data/view.php?id=6009>). With such an active community involved in developing and sharing these extensions, sustainable approaches for evaluating these extensions were essential, yet there was little institutional knowledge or guidance from the field about which of these were of pedagogical value. This project sought to identify, categorise, analyse, trial and evaluate Moodle extensions in order to fully

capitalise on the educational potential of the Moodle LMS.

Prior to the implementation, extensive research was undertaken to gather feedback from students and staff about what they wanted in the new LMS. A study into Student IT Experiences at the University (McNeill, Diao, & Gosper, 2011) provided clear guidelines about student priorities as flexibility in accessing content, opportunities for communication with their peers and teachers, feedback and convenience offered by online assignment submission. Amongst the key issues for staff were the potential to encourage student engagement with the learning process and efficiencies in managing delivery, assessment, administration and communication with students. Similar themes emerged from the research undertaken by Weaver et al (2005), who found that students who experienced a well-designed unit, with rich resources, timely feedback and good interaction with staff were more likely to report a positive experience with the LMS. These themes were used to inform the initial instance of Moodle, but also the evaluation process for determining which of the myriad of applications would be explored for subsequent integration.

The open source philosophy itself has led to a rapid increase in the amount and type of software available, and the Moodle Community itself actively promotes experimentation, development and sharing of new extensions to be added to the suite. Academics, teachers, instructional designers, system administrators and developers are encouraged by initiatives such as the Netspot Innovations Award to collaborate on developing their ideas. Books further promote these opportunities by inviting readers to ‘customize and extend Moodle using its robust plug-in systems...develop your own blocks, activities, filters, and organize your content with secure code’ (Moore & Churchward, 2010) and articles are available to guide the adaptation of existing Moodle tools (such as (Dodero, del Val, & Torres, 2010)). Specific examples of extensions that have been reported in the literature include mobile extensions to increase flexibility of access to Moodle learning environments (Alier, Casany, & Casado, 2007); tools to expedite the addition of content to Moodle sites (; Wilson, Sharples, Popat, & Griffiths, 2009); augmentations to encourage and manage student collaborations (De Lucia, Francese, Passero, & Tortora, 2009; Pérez-Rodríguez, Caeiro-Rodríguez, & Anido-Rifón, 2009) and tools to streamline administrative functions such as managing lab bookings (Ferreira & Cardoso, 2005). Many of the publications about these extensions describe the motivations behind their development to meet the needs of a specific curriculum context and experiences of students or staff in using the tools, yet there is little evidence in the literature about how to evaluate the myriad of new extensions for their potential integration into complex university instances of the LMS, let alone empirical data that assesses their pedagogical quality.

Method

An adaptation of the Communications, ICT, and Organisation (CITO) Framework, developed by Gosper, Woo, Dudley, & Nakazawa (2007) was used as the overarching evaluation framework for the project. The evaluation process also incorporated an expert review dimension to harness the collective experience and insight of the review team.

The first section of the evaluation instrument asked respondents to identify the pedagogical strategies that the tool in question supported, and the ability of the extension to support those pedagogical strategies. The second section asked to rate the utility of the extension in terms of being able to “create connections between people and places”, “create efficiencies in access to content and resources (including improving usability)”, “create new ways to participate, interact, communicate and collaborate”, and “create opportunities to generate, present and disseminate knowledge”. The third section of the evaluation instrument asked respondents to rate the usability of the extension being examined, in so far as it “provides greater access to resources”, “is easy and intuitive to use”, “is reliable with no crashes, failed page-loads or visible faults”, “fast to load and doesn’t have connectivity problems”, “has a screen layout that is clear and intuitive”, and “has a design is modern and inviting”. Both the utility and usability section adopted a seven point Likert item response scale from Strongly Disagree to Strongly Agree. The final section asked respondents to indicate the environmental impact of the extension in terms of the technical skills it required, the breadth of applicability of the extension to the Macquarie context, and whether or not the extension should be included in the University’s new LMS.

The project adopted a five-phase approach to evaluation consisting of the following stages:

- Phase 1: Characterising Moodle extensions
- Phase 2: Identifying tools for further investigation
- Phase 3: Installing identified extensions and establishing system integrity
- Phase 4: Academic evaluation
- Phase 5: Analysing evaluations and forming recommendations.

This method is described in detail below, as it is considered as potentially as useful to the educational community as the results of the study.

Phase 1: Characterising Moodle extensions

This phase involved an initial analysis of the 749 extensions that were in the Moodle extension database at the time. Excluded from further analysis were any extensions that would not function with version 1.9 or later, which resulted in a group of 255 extensions to be more closely examined. Descriptions of the extensions were reviewed and a set of nine categories was developed, which reflected the intended pedagogical strategy of the extensions. These categories are outlined in Table 1, along with the number of extensions in each category.

Table 1 – Pedagogical categories for classifying Moodle extensions

Category	Frequency
Activity	5
Assessment	33
Collaboration	20
Communication	14
Content	13
Course Format	15
Integration	52
Productivity	22
System Administration	43
Usability	38
Total	255

In later discussions with technical staff at the University Learning and Teaching Centre, it was decided to exclude Integration and System Administration extensions from this evaluation as they were dependant on the adoption of other systems currently still under evaluation by other projects.

Phase 2: Identifying tools for further investigation

A cross-disciplinary reference group consisting of 41 academic and professional staff from across the University was formed by open invitation to identify the extensions worthy of further investigation and evaluate the extensions that were selected for review. The sorted and categorised list of 255 extensions was distributed via email to the reference group, along with a brief description of each of the extensions. The reference group members were invited on several occasions to identify their “top 10” preferences from the list. Sixteen responses were received and compiled. These responses in addition to insight gained from meetings with key members of the LTC, resulted in a draft short-list of 32 extensions. This list was further reduced to 27 during a meeting with leading representatives of the reference group.

Phase 3: Installing identified extensions and establishing system integrity

A key point of learning from this project is the instability of many community-produced Moodle extensions. Of the 27 short-listed extensions, only 10 could be installed on the evaluation Moodle server with enough stability to be tested. Much of this was owing to insufficient data in the Moodle extensions database; the description of the extensions often indicated that they were compatible with versions 1.9 and above, however they were not compatible with version 2.0. Issues with installation as well as with the initial establishment of the evaluation environment caused a delay of 5 weeks in making the extensions available to the reference group for evaluation.

Phase 4: Academic evaluation

The 41 members of the cross-disciplinary reference group were provided with access to the evaluation Moodle server at the end of October. The evaluation Moodle course provided basic instruction on how to use each of the extensions being tested within it, as well as examples of activities or content created with the extensions. Reference group evaluation occurred on the basis of their hands-on use of the extensions. Sometimes this was as part of small group sessions offered by the project team, but more often through individual experimentation. Feedback was gathered via a link to the online questionnaire. The questionnaire incorporated a utility

component, a usability component, and an expert review component (as described earlier in the Methodology section). Feedback was also solicited through informal discussion and interviews.

As the commencement of this phase was delayed due to the technical difficulties described above, evaluations did not begin until the end of October. This was a period when many staff were generally focussed on end of semester work such as finalising teaching, marking exams, attending conferences and starting annual leave. Another barrier to participation was the difficulty accessing the evaluation environments from off campus (as a VPN needed to be established). Several strategies were used to increase the number of responses, including lengthening the time the testing environment was available, offering facilitated evaluation sessions, and sending personal and video reminders.

The 82 responses recorded were from participants in a range of faculties and departments. They included:

- Faculty of Arts (1)
- Faculty of Business and Economics (4), including Economics (2)
- Faculty of Human Sciences (44), including Education (27) and Linguistics (2)
- Faculty of Science (7), including Statistics (5)
- Learning & Teaching Centre (22)

These responses included 29 from final year Education students. The participant group was of mixed-ability in terms of their experience with using Moodle. Apart from the Education students (none of whom had used Moodle before), only 4% of participants indicated they were beginner Moodle users. The rest were Intermediate (21%), Experienced (38%), or Advanced (37%) users.

Phase 5: Analysing evaluations and forming recommendations

Reference group responses to the questionnaire were compiled and summarised for each extension in terms of the perceived capability and usability of each tool. Response summaries also incorporated the pedagogical strategies that respondents felt each extension supported, and qualitative feedback about the ability of each extension to do so. Reported data also included the average likelihood with which respondents would use the extension in their units, and a summary of respondents' overall recommendation about whether the extension should be integrated into the University LMS.

Results

This section provides a summary of the cross-disciplinary reference group responses for each of the extensions that were evaluated. As the aim of this project was to determine the suitability of individual extensions designed for different purposes, direct comparisons between extensions have not been made. The following extensions were evaluated (number of respondents for each tool type in brackets):

1. OU Wiki (17)
2. Forum NG (14)
3. OU Blog (10)
4. Question Type: Concept Map (10)
5. Question Type: Drag-and-drop matching (9)
6. Team Builder (8)
7. Drag and Drop File Upload (4)
8. Progress Bar (3)
9. Course Format: Grid (1)
10. Checklist (1)

Feedback from the respondents is outlined below. A brief description of each tool is provided at the beginning of each section to foreground the responses. This is followed by respondent perceptions of the pedagogical strategies that the extensions supported, the ability of the tool to support the pedagogical strategies, and qualitative observations regarding utility and applicability. This is then followed by a graphical summary of respondent perceptions relating to the capabilities and usability of the extensions for tools that received eight or more reviews from reference group members.

1. OU Wiki

Created by the UK Open University, OU Wiki is a “simple, easy to use alternative to standard Moodle wiki.” In total, 17 participants reported on the OU Wiki. Respondents reported that the OU Wiki supported group-work and/or collaborative learning (17), peer-learning (15), creation and/or delivery of media rich content (8), formative assessment and feedback (6), summative assessment (2), differentiation of learning activities and/or outcomes (1), project work (1), online tutorial activities and discussion (1), create a personal or unit-based database (1). Of the respondents, 12 rated the OU Wiki as Excellent or Very Good for supporting pedagogical strategies and 16 recommended it for inclusion in the University’s Moodle instance. Evaluators rated OU Wiki as being highly capable of creating opportunities to generate, present and disseminate knowledge as well as creating connections between people and places.

OU Wiki was also ranked highly in terms of usability, in particular for ease of use and intuitive interface. However, comments indicated evaluators found concurrent editing with other users problematic. Barriers to use indicated included lack of familiarity with the concept of a wiki and technical skills required by both teachers and students. Functional limitations noted included a lack of a left-hand navigation menu and the ability to comment on posts. Qualitative comments on OU Wiki ranged from “Great for exploring knowledge and problem solving and just general collaborative communication” to “it can only be utilized when students have the sufficient technical knowledge.”

2. Forum NG

Alternative forum for Moodle with AJAX features.

Responses were gathered on Forum NG by 14 participants. Respondents reported that this extension supported group-work and/or collaborative learning (11), peer-learning (11), administrative efficiencies (7), reflection/reflective learning (6), formative assessment and feedback (5), simulation, case-base of problem-based learning (1), online debate (1), group projects (1), and peer assistance (1). A total of 11 participants reported that it was Very Good at supporting pedagogical strategies, particularly in terms of its capabilities to improve access to content and resources. Of the respondents, 12 reported that they would recommend it for inclusion in the University Moodle (4 conditionally).

Respondents’ impressions of the overall functionality of Forum NG were largely positive and features. An example of a positive response included: “Allows better access to content for assessment: view by student; students can provide permalink to submit best posts. Better personal management of posts via flagging. Finer management control by Convenor”. Forum NG was also ranked positively in terms of usability. However some reported dissatisfaction with layout and styling as well as some inconsistencies with how Forum NG functioned, for instance commenting that “Styling needs work. We had a problem where one thread was visible to some but not all. Print button for view by user would be useful”. Two respondents provided negative feedback on reliability, indicating they may have experienced faults.

3. OU Blog

Created by the UK Open University, OU Blog is an enhanced user and course blog.

The OU Blog was evaluated by ten participants, who reported it as useful to support reflection/reflective learning (10), peer-learning (9), group-work and/or collaborative learning (6), creation and/or delivery of media rich content (6), formative assessment and feedback (5), simulation, case-based or problem-base learning (3), summative assessment (3), administrative efficiencies (1), and documenting processes (1). All ten of the respondents deemed it to be worthy of inclusion in the University LMS. Evaluators rated OU Blog and being highly capable of creating opportunities to create connections between people and places as well as create efficiencies in access to content and resources.

Respondents found OU Blog easy to use with a clear and intuitive layout; “Standard blog that is easy to use and hence attractive option for many academics”. One respondent described how the layout was more like a “blog-like forum”, rather than being similar to commercial blogs. The lack of export functionality was noted as a significant drawback. Another negative comment related to media upload, particularly: “I couldn't find a means of uploading imgs - could link to img URL.”

4. Question Type: Concept Map

A new type of question for Moodle quizzes that requires students to create and submit a basic concept map as their answer.

The ten respondents who evaluated the Concept Map question type felt that the supported formative assessment and feedback (7), summative assessment (4), reflection/reflective learning (3), differentiation of learning activities and/or outcomes (2), simulation, case-based or problems-based learning (2), creation and/or delivery of media rich content (1), group-work and/or collaborative learning (1), visual formative or summative online representation (1), and critical thinking (1). The majority of people believed this tool was 'good' at supporting these pedagogical strategies. Participants did not rank the Concept Map Question Type highly in terms of collaboration capabilities, however 5 respondents agreed that it created opportunities to generate, present and disseminate knowledge. Qualitative feedback about the utility of the tool varied from luke-warm ("needs effort for limited return" to valuing the diversity it offered ("it's a different way to engage students").

In terms of usability, the Concept Map extension was ranked highly in terms reliability and speed, though some respondents rated its design negatively. For instance respondent comments included "it is not obvious at first (at least to me) what to do, it needs more specific instructions at the top" and "there are better mind mapping interfaces about." Some experienced faults such as content created not saving or being recorded.

5. Question Type: Drag-and-drop matching

A new type of question for Moodle quizzes that creates the lists of terms to be matched by dragging and dropping one onto the other.

Drag and Drop Matching was evaluated by nine participants. Most rated it as successful for formative assessment and feedback (6), reflection/reflective learning (6), followed by summative assessment (5), administrative efficiencies (1). Overall, respondents rated the capabilities of the Drag and Drop Matching Question Type to be moderate, with around a third of respondents strongly disagreeing with its capacity to support any of the target capabilities. However all nine recommended it for inclusion in the University Moodle.

The Drag and Drop Matching Question Type was ranked highly in terms of usability, in particular for reliability and speed. Respondents reported minimal difficulties with using this question type but also indicated its value would be minimal, but potentially nice to have. Comments included "Allows students to review their knowledge. Does not rely on students typing and possibly misspelling a word" and "the exercise in itself is a formative assessment tool. It has the danger of being used for summative assessment."

6. Team Builder

Intelligently builds groups based on criteria specified by an instructor and responses given by students.

Eight of the respondents evaluated Team Builder. These respondents felt Team Builder supported group-work and/or collaborative learning (8), peer-learning (4), formative assessment and feedback (3), creation and/or delivery of media rich content (3), administrative efficiencies (3), simulation, case-based or problems-based learning (2), reflection/reflective learning (1), summative assessment (1), differentiation of learning activities and/or outcomes (1), and group work assignments (1). Of these respondents, seven recommended it for inclusion in the University Moodle instance. Respondents indicated Team Builder was suited to collaborative learning and connecting people and places. Team Builder was ranked moderately in terms of performance, with the basic requirements of being reliable and fast to load being met.

Respondents found Team Builder difficult to use and were unsure about its ability to actually create teams. For instance, one respondent commented "seems more trouble than it's worth". However others could see its niche value, commenting "Not many people would use this, but for a select few it may make their life much easier".

7. Drag and Drop File Upload

Drag and drop one or more files directly from your desktop into a Moodle course.

The four respondents who evaluated Drag and Drop File Upload, felt that it predominately supported administrative efficiencies (2). One commented that "drag and drop is more administrative, than pedagogical... it is a workflow [tool]". One person felt it could be used to support group-work and/or collaborative learning, reflection/reflective learning. Of the respondents, three recommended for inclusion in Moodle.

As Drag and Drop File Upload is primarily an administrative tool, it was not ranked highly in terms of pedagogical capability. Respondents indicated functionality problems with using Drag and drop File Upload, with one not able to get it to work at all (“I could not get this to work using Mac OS 10.6.8 and Firefox 7.0.1”). However those who were able to use the tool rated it positively.

8. Progress Bar

A block that allows students and teachers to track student progress in all courses from the front page as well as from within each course via a graphic bar.

Three respondents evaluated the Progress Bar and rated it as supporting reflection/reflective learning (1), formative assessment and feedback (2), administrative efficiencies (1), performance monitoring (1), and motivation (1). All three recommended it for inclusion in Moodle. Feedback on the pedagogic capabilities of Progress Bar was mixed, owing to its predominantly administrative and motivational functionality.

Progress Bar was ranked highly in terms of usability, in particular for its intuitive interface. No specific faults or limitations were reported. Comments on Progress Bar included “I can see students really responding to the task oriented nature of the tool - "this is what I need to do next."

9. Course Format: Grid

An alternative course format that presents topics as images laid-out in a grid.

This extension was rated by only 1 respondent, an advanced staff user. Feedback provided was positive in terms of usability but largely negative in terms of pedagogical value. The respondent commented that “Since it is just providing an alternative interface option, then why not include it (as long as it is reliable).” In response to whether or not they would use it in their own teaching, the respondent indicated: “Probably not, I like to be able to lay the content out directly so students can see the whole unit.”

10. Checklist

Allows student progress against a set of activities within a course to be tracked.

Only 1 staff response was received for Checklist, with 1 additional response from a student. Feedback was similar to that for Progress bar in terms of pedagogical application, however it was reported as less usable and with more limited functionality than Progress Bar.

Summary of Capability and Usability Ratings

Figure 1 presents a summary of the feedback on the evaluation of the capabilities of each extension, presented as an average for each. Those extensions with fewer than eight evaluations have been omitted from the table. OU Wiki, OU Blog and Forum NG were all rated highly for their capabilities to generate, present and disseminate knowledge, create new ways to communicate and collaborate, create efficiencies in accessing content and creating connections.

A summary of the responses relating to the usability of each extension types is included in Figure 2, again with average ratings presented. As with the Capability ratings, the more established collaborative tools (OU Wiki, Forum NG, and OU Blog) received the most consistent ratings, though the Drag-and-drop matching and Team Builder extensions rated highest in terms of speed and reliability.

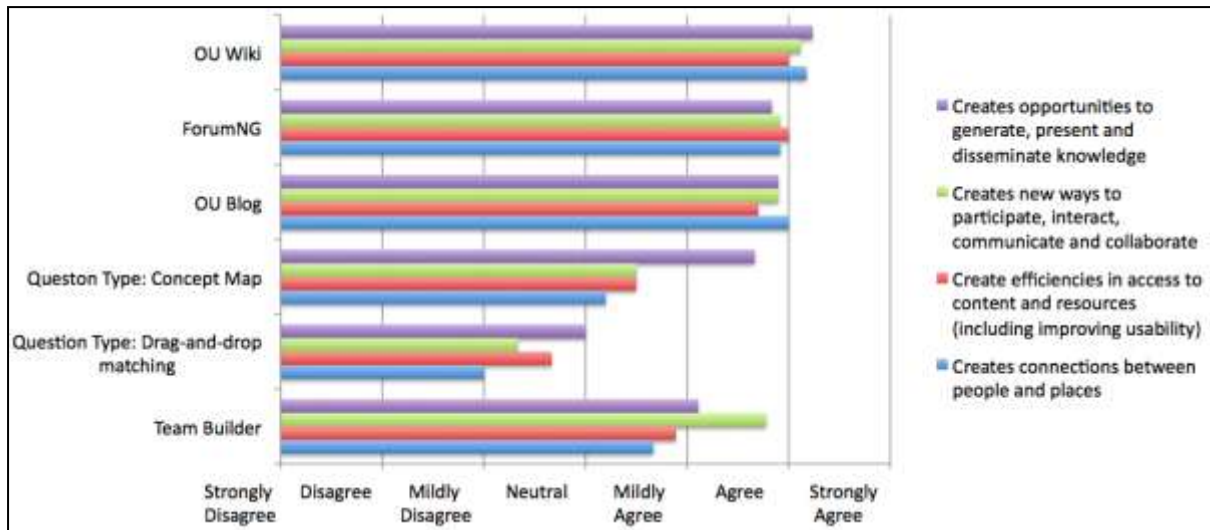


Figure 1: Respondent perceptions of the capabilities of evaluated extensions

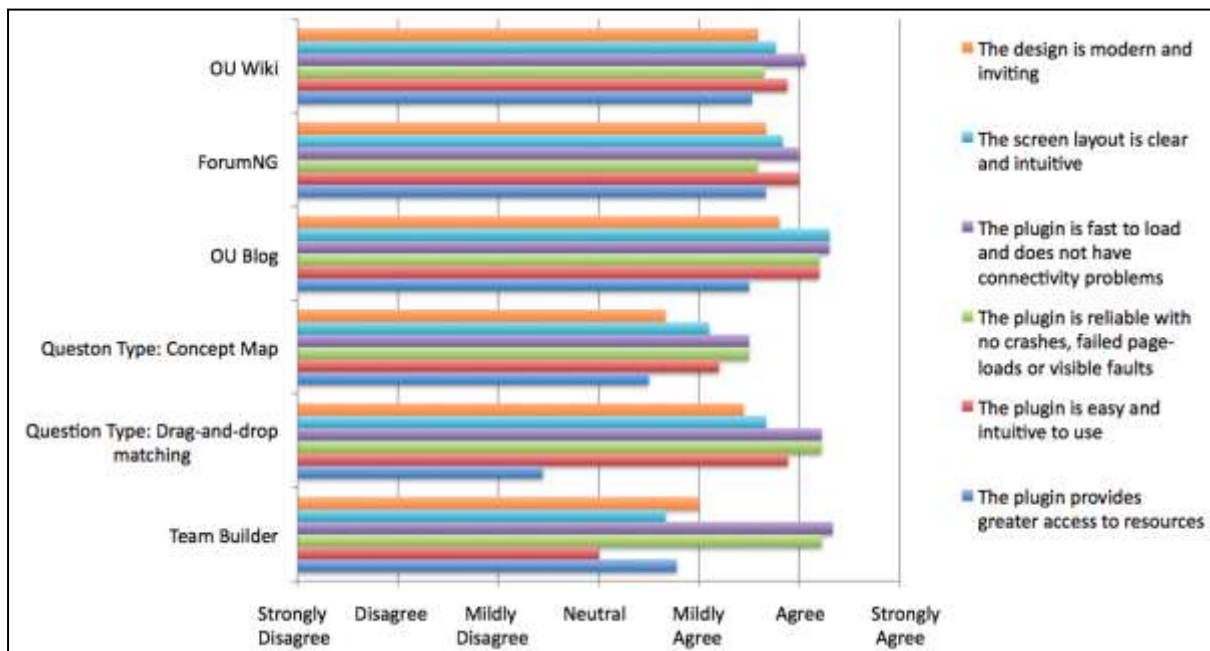


Figure 2: Responded perceptions of the usability of evaluated extensions

Discussion

Based on feedback from the cross-disciplinary reference group, Table 2 summarises the final recommendations for including evaluated extensions into the Macquarie University LMS. The extensions rated most highly by the participants were the tools most typically associated with LMS environments, such as wikis, forums and blogs and are useful in encouraging student communication and collaboration. These elements were rated as important in the University surveys on student IT experience. Given that the respondents were volunteers who needed to spend time out of their normal workload to evaluate the extensions, it might be that they selected tools according to their priorities and began with the most important. This could also suggest that the name of the tool can an issue; if the name did not provide a clear indication of what the tool did, then it may not have been prioritised.

Table 2 – Extensions recommended for inclusion in the University LMS based on respondent feedback

Extension	Would use in teaching	Average applicability score	Include in iLearn	Overall recommendation
1. OU Wiki	13 Yes 3 Maybe 1 No	78%	16 Yes (2 conditional) 1 No	Include
2. Forum NG	10 Yes 2 Maybe	90%	12 Yes (4 conditional)	Include
3. OU Blog	8 Yes 2 Maybe	78%	10 Yes	Include
4. Question Type: Drag-and-drop matching	5 Yes 4 Maybe	71%	9 Yes	Include
5. Question Type: Concept Map	4 Yes 5 Maybe 2 No	62%	7 Yes 2 No	Include
6. Team Builder	3 Yes 4 Maybe 1 No	69%	7 Yes (2 conditional) 1 No	Include
7. Drag and Drop File Upload	2 Yes 1 Maybe 1 No	73%	Yes (3 conditional) 1 No	Include
8. Progress Bar	2 Yes 1 Maybe	94%	3 Yes	Include
9. Course Format: Grid	1 No	100%	1 Yes (conditional)	Include
10. Checklist	1 Yes 1 Maybe	76%	2 Yes	Do not Include

Although there are several hundred extensions available on the Moodle Community website, only a small handful were deemed suitable for Macquarie University's Moodle 2.0 LMS. One of the attributes of community-based open-source software is that extensions are often not maintained or upgraded in step with the core system development cycle, which has serious implications for the sustainability of the extensions. Many are rendered obsolete when a new version is released. The Moodle Community website has recently reorganized their main extensions page to account for this, back-grounding outdated plugins.

This project only performed a pedagogical evaluation from the teachers' perspective. Participants rated the extension in terms of being able to "create connections between people and places", "create efficiencies in access to content and resources (including improving usability)", "create new ways to participate, interact, communicate and collaborate", and "create opportunities to generate, present and disseminate knowledge", with those most familiar tools such as OU Wiki, Forum NG and OU Blog being rated most highly. Further exploration is needed to capture student perspectives. Testing of the stability, scalability and technical environmental fit would need to be undertaken before any of the plugins identified as valuable were integrated into the University LMS. The technical testing should at least include a focus on:

1. Accessibility
2. Confidentiality and security of data
3. Intellectual property and development potential
4. Scalability for use large or small units
5. Administrative functionality
6. Quality of support documentation

There is also an inherent tension between the flexibility of the open source nature of Moodle and the complex and unique instances that are implemented in each university, providing a stark reminder of the need for comprehensive testing of open-source developed extensions before full release.

One limitation of this study was that the rate of participation from testers was lower than anticipated. This was owing to delays of establishing the evaluation environment that pushed the evaluation phase closer to the end of semester when fewer staff were available. Simplified off campus access to the testing and evaluation environment would also have helped improve response rates. A larger sample of responses would have enabled more reliable conclusions to be drawn and may have resulted in different recommendations being formed. The time-poor nature of academics and the high level of engagement required for them to explore new extensions and evaluate them for possible use in their specific teaching contexts is an ongoing challenge. While the notion of a community approach to developing and evaluating new tools is a noble principle, it is reliant to a large extent on the time and goodwill of busy academics. In addition to this exploration from within specific curriculum contexts, the effective evaluation also requires input from central units to ensure sustainability and scalability from a university-wide perspective. Add to this the technical input required to judge the feasibility of the implementation and the scale of the evaluation process becomes apparent.

This study has already informed the adoption of two extensions within the University's new LMS – OU Blogs and OU wikis. These were seen as valuable additions and after technical testing were installed for use in Semester 1, 2012. Apart from determining a range of pedagogically appropriate extensions for the University's LMS, the functional analysis tool is another positive output of this project. This built on previous evaluation tools and can be used as an evaluation instrument for other technologies in other projects. While the specific extensions analysed in the study will eventually become obsolete, the functional analysis tool can be used independently of particular LMS platforms or versions thus enhancing sustainable development of learning technology platforms. Another benefit of this project was the unification of the University's educational community behind the implementation of the new LMS. Over 41 academics expressed interest in this project and many combined forces to contribute to the evaluation. This team offers an ongoing working party to evaluate new extensions and feature requests as they emerge. The momentum of this network is being continued through the Macquarie University Learning Technology Research Cluster.

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