How often do students use a learning management system in an on-campus, problem-based learning curriculum?

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Abstract

This study investigated how often students used a learning management system, TopClass, in an on-campus course (Medicine) at The University of Melbourne. Students used the learning management system (LMS) to manage their access to learning materials, particularly lecture notes and assessment tasks. They also used the system to keep up-to-date by reading the latest announcements provided by faculty and to read what some of their peers had written through discussion lists and messaging. There are differences in usage as the course progresses and between international and local students.

Introduction

This paper investigates how often students make use of a learning management system (LMS) that supports an on-campus problem-based learning curriculum. Learning management systems (LMSs) are a collection of online software applications, packaged together to deliver teaching and learning in either a distance education or an on-campus mode. They harness the individual technologies and put them together in one package that can then be used by teachers and learners in a variety of ways. In addition, LMSs offer a number of administrative tools to facilitate the management of courses and student accounts, grade books, usage statistics, content authoring, timed release of materials, calendars, personal information and integration with other administrative systems.

LMSs are being widely implemented in higher education institutes within Australia. Figures for Europe suggest that about 80% of institutes have implemented or are implementing an LMS (Valcke, 2004). LMSs help to solve the problem of delivering quality teaching and learning programs to large numbers of students in on-campus and distance education modes of teaching, although their utilisation as pedagogic tools requires further investigation (see Minielli & Ferris, 2005). LMSs are generally used for four purposes in an academic environment: resource/content provision, communication, assessment and administration and these features are all available to users 24 hours per day.

The Medical Curriculum at The University of Melbourne employs a problem-based learning (PBL) approach. In the first five semesters the curriculum is organised around weekly problems using small group teaching supported by a facilitator. A key component of this is self-directed learning where students explore learning issues, determined during the PBL tutorial, through a number of resources made available to students, including lecture notes, book chapters, computer assisted learning modules and websites. This process is reported elsewhere for the interested reader (Keppell, Kennedy, Elliott, & Harris, 2001).

Aside from its administrative purpose, the LMS supports the curriculum primarily through the provision of course materials and resources (PBL digital resources, lecture notes and synopses, resource lists and assessment tasks) and communication technologies (messaging, announcements and discussion lists).

Specifically, the course materials include interactive media elements (images, movies, shockwave, and flash) are supplied during the PBL and as a trigger to framing the problem, lecture notes, synopses, past exams are supplied as downloadable PDF files and self-assessment tasks use the LMS's multiple choice question system. General resources in the form of useful links are also supplied. The communication features provided by the LMS include an internal email messaging system, an announcements feature that allows Faculty staff to inform entire cohorts of students and discussion lists to which students are automatically subscribed and include technical issues-related, course-related, social, PBL-group-related and assessment-related groups.

Given the four roles of LMSs outlined above, and its specific use in the Medical Curriculum at The University of Melbourne, it is worth considering how students who are on-campus, and have substantial contact with peers, lecturers and tutors, use an LMS. The general evaluation question guiding this research was: "How are on-campus medical students using the LMS within a problem-based learning curriculum?" Moreover, we were interested in whether subsets of students (eg. international versus local) use the LMS differently and whether student use changes as they progress through the curriculum?

Method

Students in Semesters 2 (first year) and 4 (second year) of the Medical course were asked to complete a questionnaire in their PBL tutorials. The questionnaire was distributed to students in the second last week of the 14 week long semester (in October 2004). A total of 262 and 263 complete questionnaires were returned from Semester 2 and 4 students respectively (a response rate of 92.9% and 98.1%). The samples contained roughly equal numbers of males and females (males = 45%; females = 55%). A critical variable in this investigation was residency status and more local than international students were in the sample (local = 68%; international = 32%).

The questionnaire consisted of fixed-response and open-ended questions in three sections. This paper only reports some of the data from a wider investigation. A number of additional questions were included in this survey which are beyond the scope of this concise paper and will not be reported. The first section asked students 'How often' they used the LMS for twelve purposes which can be classed into three categories: *communication*, *course material* and *assessment*. The possible responses were 'daily', 'three or four times per week', 'once or twice per week', 'fortnightly', 'once or twice per semester', and 'never'.

Results

Table 1 presents the distributions for how often students used the LMS for the 12 purposes in Semesters 2 and 4. The original scale for these items on the questionnaire has been collapsed to create a 'Weekly category' to assist with the interpretation of the data.

Table 1: The percentage of students in Semesters 2 and 4 using the LMS for communication, course material and assessment tasks over four time periods

| | Percentage | | | | | | | |
| | **Weekly** | | **Fortnightly** | | **1–2 / semester** | | **Never** | |
Purpose	Sem 2	Sem 4	Sem 2	Sem 4	Sem 2	Sem 4	Sem 2	Sem 4
Communications								
Read messages	54.9	39.9	11.5	8.7	12.3	12.5	21.5	38.8
Send messages	4.7	1.5	15.1	10.6	32.0	33.1	48.3	54.8
View announce	91.9	93.1	7.4	6.5	0.8	0.0	0	0.4
Read discussions	42.4	23.6	28.6	35.7	16.2	27.0	12.7	13.7
Post discussions	8.9	3.1	22.1	17.2	23.3	34.9	45.7	44.8
Course Material								
View lecture synopses	45.3	40.6	7.7	2.7	11.9	9.2	35.0	47.5
View lecture notes	95.8	97.3	3.8	1.5	0.4	0.8	0.0	0.4
View practical seminar	NA*	34.8	NA	33.6	NA	24.4	NA	7.3
View POWs	34.4	32.7	23.2	22.3	19.7	23.5	22.8	21.5
View HP resources	11.1	32.1	27.6	25.2	45.6	33.2	15.7	9.5
View general resources	12.7	13.8	33.7	32.6	41.8	44.1	11.9	9.6
Assessment								
View past exams	11.4	9.6	32.6	21.8	55.2	67.8	0.8	0.8
View self-assessment	20.3	12.5	45.2	44.5	31.4	37.3	3.1	5.7

*NA = not applicable

Table 1 shows that most students were reading announcements from faculty staff on a weekly basis (Semester 2 = 91.9%; Semester 4 = 93.1%). Many students were also reading messages on a weekly basis (Semester 2 = 54.9%; Semester 4 = 39.9%) but student were generally less likely to send messages (with around half of the students indicating that they never sent messages (Semester 2 = 48.3%; Semester 4 = 54.8%). Similarly, students were more likely to read discussions on a weekly basis but were less likely to post discussion content, with almost half of students never posting to the discussion lists (Semester 2 = 45.7%; Semester 4 = 44.8%). Students viewed course material weekly, particularly lecture notes (Semester 2 = 95.8%; Semester 4 = 97.3%). Past exam papers were viewed once or twice a semester (Semester 2 = 55.2%; Semester 4 = 67.8%), while self-assessment tasks were viewed mostly fortnightly.

Comparisons between Semester 2 and Semester 4 students, both local and iternational students were made using Chi-square tests. These tests generally showed that participation in communication decreases between Semester 2 and Semester 4. Semester 4 students were more likely to indicate that they never read messages (χ^2 (3) = 20.15; p < .001) compared to students in Semester 2. Many students read discussions weekly (42.4%) or fortnightly (28.6%) in Semester 2, while in Semester 4 students were more likely to read messages fortnightly or a few times per semester. More students in Semester 2 read discussions at least once per week than do students in Semester 4 (χ^2 (3) = 23.32; p < .001). There was no difference between Semester 2 and Semester 4 students in their viewing of course materials or assessment tasks. The majority of both groups of students viewed lecture notes at least once per week. At least 40% of students were viewing the lecture synopses online. The frequency with which students viewed problems of the week, Health Practice and General resources was evenly distributed across the four time periods. More students in Semester 4 were viewing Health Practice resources on a weekly basis (χ^2 (3) = 35.88; p < .001). Almost all students viewed past exams and self-assessment tasks. The majority of students were using them fortnightly or a couple of times a semester. In Semester 2, over one-fifth (20.3%) of students were using these resources weekly.

In comparing international students with local students, the Chi-square tests show that more international students post to discussions than do local students (χ^2 (3) = 10.19; p = .017). More international students view course materials on a weekly basis than do local students. These resources include Problems of the week (χ^2 (3) = 12.73; p = .005) and General resources (χ^2 (3) =18.99; p < .001). More international students view assessment materials than do local students on a weekly basis: past exams (χ^2 (3) =22.23; p < .001) and self-assessment (χ^2 (3) =12.63; p = .006).

Discussion

This study investigated how students used a learning management system, TopClass, in an on-campus course (Medicine) at The University of Melbourne. We found that students were predominantly using the LMS for viewing announcements, reading messages and discussions, downloading and printing lecture notes and to a lesser extent accessing other course materials, viewing self-assessment tasks and past-exam papers. Students are using the LMS to access and manage resources that are important for their learning. It provides one location for students to obtain a large number of resources online, whenever they want. It increases efficiency by saving time and providing convenience. These results are supported by other studies such as Ballard, Stapleton and Carroll (2004) who found that students favoured the use of announcements, course assignments, course documents and their grade books in using the LMS, while about half of the students sampled also found using email important.

Students were subscribed to a number of self-regulated discussion groups related to their coursework, the PBL process, technological issues and social activities. Our findings show that many students prefer to read rather than contribute to discussions, but about a third of students contributed to messaging and discussion once or twice a semester. People may not contribute because others have raised an issue before them or they may be lurking. Lurking behaviour allows students to benefit from the discussions others start and contribute to, without necessarily being "selfish free-riders" (Preece et al., 2004). Students in Semester 2 were heavier users of discussion and messaging compared to Semester 4 students, indicating that this method of communication was less important for students in later years: possibly because they have other means by which to communicate with their fellow students. In addition, the curriculum design provides many opportunities for students to contact and collaborate with each other and staff members face-to-face. While the focus of their contact is the PBL tutorials, there are opportunities in lectures, laboratory classes and between formal classes to collaborate. This might lend support to the finding that nearly half the students in both semesters never used the LMS to send messages or post discussions. One reason might be that students may use other mechanisms to express themselves online such as email or chat. Alternatively, this type of technology may not be relevant to them educationally or socially.

In the comparison of international students and local students it was found that more international students participated in discussions than did local students, and more international students accessed the learning resources and assessment tasks than did local students. While it is not clear why this is the case, there are many potential explanations. As a means of support in a new environment the LMS may be more relevant to international students. There may be some underlying reason that international students are more comfortable with the medium. The finding that cultural differences can drive online usage of communications technologies has been reported elsewhere (Jones & Johnson-Yale, 2005) and might be fruitful avenue of further study.

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