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On line learning for Personal and Professional Development in Medicine

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Abstract

An on-line learning platform was used for a final learning opportunity in personal and professional development for medical students at a new medical school in Greater Western Sydney (Australia). Students were provided with prescribed forum content and had the opportunity to pose self-directed topics. This study details the extent of student involvement in the on-line learning opportunity, and the differences between the student involvement in the prescribed versus student-directed forums. Methods: Learning opportunities were provided by both nine predetermined topic (PT) forums, and by additional student-directed topic (SDT) forums. Participant performance was analysed by number of postings per forum (student and facilitator), and quality of the postings (students only), adjudged by case presentation (personal experience), referencing to the literature, and involvement in discussion (reflection of other student postings or posing challenges to other postings). The themes of SDT were assessed and analysed compared to the PT against 14 ethical principles. Results: There were 9 PT and 26 SDT topics and 903 postings (PT) and 505 (SDT) respectively, a 54% increase for SDT. The themes for the PT covered 9 ethical areas and for SDT, 14. There was a significant increase in case material (61% vs 36%, p<0.001) and student reflections/challenges (88% vs 78%, p< 0.001), but a significant decrease in referencing (34% vs 42%, p =0.012), for SDT compared with PT forums. Conclusion. The student-directed topics covered a broader range of topics to those predetermined, and were more likely to include case material and reflection on other student contributions, and less likely to refer to the literature.

Article

Background

There is an increasing emphasis on providing and supporting on-line learning as a substantial part of medical education (Cook et al 2010). The mode of delivery of any computer-mediated communication needs to consider the cognitive presence, the social presence, and the teaching presence in the "Community of Inquiry" (Garrison and Anderson 2001, 2003). The theoretical framework for on-line learning is that rather than being

an alternative to routine delivery of content, and development of tacit knowledge, the on-line learning environment provides expanded opportunities for aspects such as delivery in asynchronous time, individualised learning, and tracking for the purposes of assessment and certification of student learning. The potential to expand the range of subject matter available has not been explored in the medical teaching literature.

The development of professional behaviours in medical students is frequently presented under courses which include elements of Personal and Professional Development (PPD). This often includes case presentations, and review of ethical principles (Monrouxe et al 2011). These encompass learning of ethical principles, reflection on clinical cases and professional incidents that have formed the students' and their tutors' experience in the practice of medicine, and preparation for clinical practice. A key aim is to allow increased mastery of communication skills, both with patients and between professionals, as well as to learn to engage in ethical discussion.

The UWS medical school (Sydney Australia) is a new medical school with its first graduation class in 2011. The philosophy behind the on-line learning has been to allow exploration of subject areas that cross disciplines and that are not traditional "set" terms in medical training. Students experience on-line learning in the years 3 to 5 of a 5 year course, and gain experience with a community of learning in each of aged care medicine, drugs and addiction, immunity and infection, trauma and critical care, cancer medicine, cardiovascular disease risk management, genes growth and development, nutrition, Indigenous health, and technology and testing. They undertake the final PPD unit in the last 16 weeks of their course.

The aim of the present study was to track students' cognitive presence (selecting content), social presence (Rourke 2002, Richardson 2003), (supporting discourse and setting the climate for discussion), as well as the teaching presence in a recently developed on-line course delivered in 2011, and to compare and contrast student involvement in forums predetermined by faculty, versus those determined by students themselves.

Methods

In an online course at UW School of Medicine, Sydney Australia (July – Oct 2011), nine predetermined topic (PT) forums were provided, and the opportunity for student-initiated topic forums was provided. The number and quality of student responses to additional student-directed topics (SDT) was analysed by; number of postings per forum (student and facilitator); and quality of the postings (students only) in terms of case presentation (personal experience), referencing to the literature, and involvement in discussion (reflection of other student postings or challenges to other postings). These were compared to similar analysis of the PT forums. The themes of student-directed topics were assessed and analysed compared to the predetermined topics (PT) against 14 ethical principles or areas.

Results

The ethical principles discussed in the 9 predetermined topics are provided in Table 1. There were 13 areas of discussion in the PD topics, all of which were again covered in the SDT. The SDT also covered 5 additional areas, namely international health, public health, patient capacity, technology and medicine, and several about the on-line learning experience *per se* (Table 2).

Altogether the predetermined forums resulted in 931 postings, of which 825 were student postings, and these collected 297 student case presentations, 643 reflections or challenges, and 343 referenced postings. The student- directed topics attracted 503 postings, of which 425 were student postings. Of these, 258 contained cases, 373 reflections, and 145 were referenced. There was a significant increase in the number of postings

containing case material and reflection in the SDT, and there were significantly less references in these forums (Figure 1).

Students were directed to undertake a minimum of 3 postings per forum, but the actual number exceeded this significantly, with 72% of students posting additional responses in 8 forums (Figure 2). The average number of postings per student was 14, with 25 facilitations/references or case presentations across all forums.   Each PT forum had between 21 and 27 students, with a median of 23 students. The SDT forums had between 2 and 22, with a median number per topic of 7. Twenty-nine students participated only in PT and 9 only in SDT forums.

Forums were scored according to the number of participations, but additional points for literature, facilitation, and cases accorded bonus points according to the number of those entries posted. The SDT were scored collectively as a single forum for the final student grades.

Facilitators added 106 postings to the predetermined topics and 78 postings to the student-directed forums. No referencing was provided by the facilitator, but suggestions on the types or sources of relevant scholarly articles were made. Facilitation was provided by senior faculty. Student feedback was required at the end of each forum but was not formally analysed.

Discussion

These results demonstrate that student-directed topics in personal and professional learning covered a broader range of topics than those provided in predetermined forums. Student-directed topics had a statistically higher rate of case presentations and facilitation, and were less likely to be referenced. There was a greater than expected level of involvement by a majority of students in this 16 week learning experience.

The increased choice of topics demonstrates a high cognitive presence of the students in the formation and conduct of the on-line learning environment. The notion of user-generated content increases the collaboration and participation in the learning experience (Potts 2011). Although issues raised by Potts et al include student anxiety about the activity, there was no evident anxiety in the student feedback from the forums as conducted here, although this was not specifically explored. The student-directed topics in this PPD course were generally attended by smaller numbers of students with smaller numbers of postings per student. Potts proposes that group size is a critical determinant of self -sustaining activity in this type of learning. To potentially improve the learning and teaching experience, it is reasonable to consider limiting the number of available student-directed topics or to proscribe a level of facilitator involvement to ensure that topics areas are explored and challenged. However, the inclusion of student-directed forums allowed us to ensure "Local context and needs" were met (Amin et al 2011) albeit with smaller group sizes. Interestingly, the additional topics of Population health and International health, reflected the student elective (international learning experiences) and demonstrated a breadth to their interests and learning.

The increased number and detail of case reflection and commentary on other student involvement, indicates a higher level of social presence in the forums. This confirms with the view that social presence is an integral part of any on-line learning experience (Stacey 2002, Tu, 200). This study is the first to demonstrate that student-directed content has a significantly higher rate of discussion between students, especially with regard to case material and reflection.

The contribution of the facilitator in these forums indicates a reasonable level of teaching presence in the learning community.   The role of the facilitator has been explained (Lulee 2009) as one who clarifies and diagnoses student misconceptions, presents content and questions to direct attention to particular conceptions or information for framing knowledge, but also expresses appreciation, providing assessment and explanatory

feedback. The facilitator engaged in all of these aspects of on-line teaching. A smaller amount of time in other analyses was to deal with procedural and administrative matters. These were not roles required of the facilitator in the current on-line course, as those functions were provided by an on-line course manager. As new and more facilitators are engaged in the on-line teaching environment of the current course, details and tracking of the components of the teaching presence could be undertaken.

In general, the high rate of student involvement in the on-line course as described was gratifying, and the student feedback was positive for the maturity of, and extensive nature of the material that was covered. Ethical and Professional issues lend themselves to teaching and learning in an on-line environment and formal analysis can readily be constructed as part of the course.

"Student quote: After 5 years of medical school and discussing ethical principles, I still struggle with the right thing to do in situations where ethical principles seem to be competing with each other. Each case is really its own and every patient deserves our fresh thoughts".

Table1. Prescribed Topics provided in an online learning module for personal and professional development of medical students.

Forum	Ethical Principle 1	Ethical Principle 2	Ethical Principle 3	Number of posts
1	Workforce and Peer support	Self - Help	Truthfulness	110
2	Workforce and Peer support	Self - Help		87
3	Medical Errors/non-maleficence			92
4	Professional communication			97
5	Medical Errors/non-maleficence			85
6	Dignity/Equity	Beneficence		89
7	Confidentiality			141
8	Confidentiality			145
9	Internship	Professional Communication		85
Total				

Table 2. Student-directed topics

Forum		Ethical Principle 1	Ethical Principle 2	Number of posts
1	Foetal Medicine - accidental death of a twin	Medical Errors/non-maleficence		4
2	The ethics of excessive postings to on line learning	**On-line learning per se**		25
3	Are the PPD forums useful?	**On-line learning per se**		10
4	Damned if you do (Spend money on an expensive surgical procedure)	Medical Equity and Resources		9
5	Compulsory vaccination	**Public Health**	Beneficence	14
6	Defensive Medical Practice	Medical Errors/non-maleficence		15
7	Ethics of the elective in the Developing World	**International Health**	Confidentiality	8
8	Training opportunities in Australia	Workforce		11

9	Medical Student selection process	Workforce		22
10	Narcotic abuse	Self - Help	Professional Communication	3
11	Hints and tips for internship	Workforce and Peer support		23
12	The Inappropriate Patient	Dignity/Equity	Beneficence	10
13	Should Medical Students take an oath?	Professional Communication		68
14	Medicine in the Future	**Technology and Medicine**		11
15	Budding neonatologists? The 23 week dilemma	Dignity/Equity	Justice	14
16	The newIintern and the un-contactable Registrar	Workforce and Peer support	Professional Communication	28
17	Self-medicating doctors and drug abuse	Self - Help		18
18	The Useless Consult	Internship	Professional Communication	66
19	Why don't we seem to like PPD?	**On line learning per se**		22
20	Doctoring doctors and staff	Self - Help	Professional Communication	24
21	Social Networking and medical professionalism	Professional Communication	Confidentiality	42
22	Patient/Family members as interpreters	Confidentiality		3
23	Of death and dying	**Patient capacity**	Non-maleficence	9
24	Phone calls during patient consultation	Confidentiality		11
25	Surgical integrity - maintaining sterility	Medical Errors/non-maleficence	Professional Communication	14
26	The difficult historian	Dignity/Equity	Beneficence	21
Total				**505**

Table 3: Absolute numbers of case presentations, student reflections and challenges and referencing in Predetermined topics (PT) vs Student –directed topics (SDT) on an online forum for personal and professional development. (**$p<0.0001$; *$p<0.05$)

	Cases	Literature referencing	Facilitation	Total	postings
PT	297 (36%)	343 (42%)	643 (78%)	1423	825
SDT	258 (61%)	145 (34%)	373 (88%)	776	425

Figure 1. Case presentations, student reflections and challenges and referencing in Predetermined topics (PT) vs Student –directed topics (SDT) on an online forum for personal and professional development. (**$p<0.0001$; *$p<0.05$)
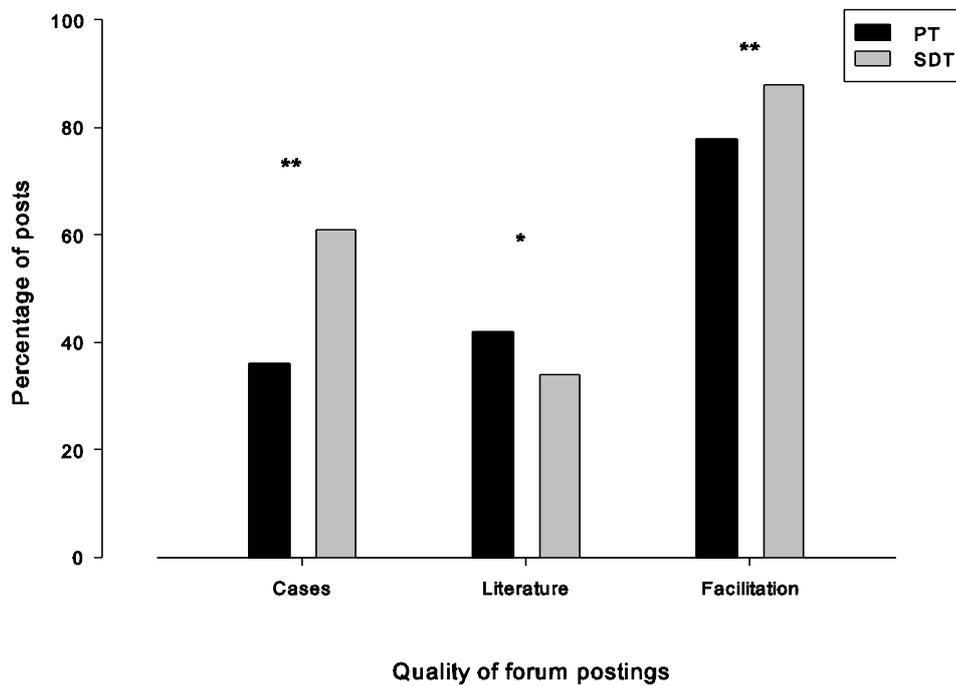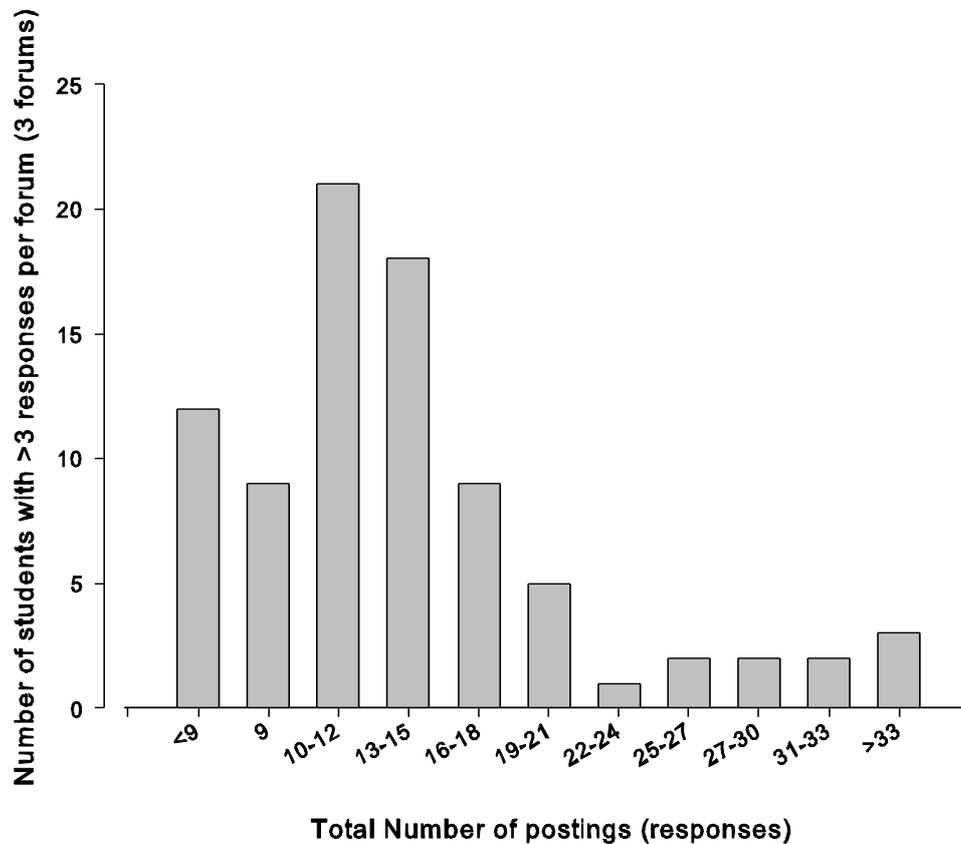
Figure 2. Frequency distribution of all on-line postings for professional development topics for final year medical students.

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