Adapting social media as a scaffolding tool for teaching health informatics

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Health informatics is an applied hybrid discipline of health and life sciences, computer science and business. Teaching this subject to undergraduate students, presents the challenge of learning without the assistance of internship or work experience that enable placing the learning in context. We used the university's learning management software as a form of social medium to stimulate discussions in preparation for two assignments, while creating an environment in which scaffolding could occur for both students and teachers. An iterative action research process was used, which included an assessment of student digital mindedness, scaffolded online discussions that were assessed as part of each of the two assignments, and a questionnaire at the end of the semester. We found that the online discussions were valued by the students and added value to their learning, because they could use their social presence in a format familiar to them, and also use a process of collaborative knowledge creation about health informatics.

Keywords: health informatics, authentic learning, social media, online discussions

Introduction

Every day in New Zealand, people who work in the health system use some form of electronic information, ranging from the level of national politics to that of a face-to-face consultation between a sick person and their doctor. Information is collected, stored, used and reused as part of the health information system that supports this complex world (Coiera, 2003). This contextual complexity, which is important in health informatics, is difficult to simulate in the classroom. Students with a work history in a health setting or organization appear to find it easier to learn about health informatics than those who are still studying in the field before starting their work life in the healthcare system. This is evidenced by the emphasis in most universities on health informatics as a postgraduate study programme.

Health informatics is a hybrid discipline and is defined by von Bemmel and Musen (1997, p. 27) as

> …the theoretical and practical aspects of information processing and communication, based on knowledge and experience derived from processes in medicine and health care.

Health informatics builds on the bodies of knowledge of clinical, health service management and information and communications technology (ICT) (Effken, 2002). This is an applied field and has spawned informaticians who were first clinicians, managers, information systems managers, project managers, and then became health informaticians. Until recently health informatics was taught only at postgraduate level. However, some universities are now teaching health informatics to undergraduate students who have little or no work experience in healthcare services upon which to contextualise their learning. For students who have never been employed in the health sector or have never been patients, the next best way of accessing this knowledge is by means of discussion with experts, others who have health informatics experience and one another.

As pointed out by McLoughlin (2002) scaffolding is a form of learner support provided in a variety of ways, eliciting a number of roles and responsibilities for students, lecturers, experts and other participants in the construction of knowledge. The introduction of ICT to support communication, and the use of distance learning approaches, has changed the nature or scaffolding because the environment has

changed. In the case of undergraduate health informatics students, who are mobile and digitally minded, as described by Andone et al (2007), and use the classroom and other settings as learning environments, scaffolding must be adjusted to meet their complex learning needs. Scaffolding involves responsive support from teachers as students learn (McLoughlin, 2002). With the advent of social media and its adoption as an everyday social tool for connectedness, scaffolding can be released from the tyranny of time and distance (Boulos, Maramba, & Wheeler, 2006). Consequently, the actors in the learning nexus of theory, practice, expert opinion, and academic research, are now extended to people in the whole world, rather than in the world of a specific discipline and its associated field of practice.

ICT is commonly used in distance and online learning settings, where the student has little or no face-to-face contact with the teacher (LeBaron & McFadden, 2008). However, with the advent of Web 2.0 and continuing development of social media, this has changed. Hemmi, Bayne and Land (2009) maintain that since students already collaborate, search for information, communicate and socialise using web technologies as part of their everyday lives there is no reason not to use the same skills and behaviours in the classroom to support learning. This kind of digital mindedness gives the teacher the opportunity to use ICT to extend the classroom into the workplace and possibly other authentic learning environments in the world, and to draw upon expertise that otherwise may not be available to students, e.g. by using email, blogs, online discussions, podcasts and wikis (Boulos et al., 2006).

Andone et al (2007) provide a description of 'digitally minded students' that conjures up images of students co-creating their learning with other students and expecting their teachers to participate by providing course design and learning tools that accommodate their social networking behavior. A constructivist response from educators may involve creative adaptations of existing ICT tools to meet this demand (Hemmi et al., 2009). Online learning tools are used in different ways – entirely on their own for distance learning, as part of the suite of tools for blended learning that includes face-to-face instruction or simply as a supplement to face-to-face instruction (Mishra, 2002). This does not mean that using social media is always successful. Hannon (2009) presents a socio-technical analysis of failures of online learning, in much the same way as recent explanations of failures of health information technology projects, using social network theory as a basis for the explanation (Lamb & Kling, 2003). However, the success of using social media in changing how education occurs in healthcare cannot be ignored, e.g. Guistini (2006) provides examples of how medicine includes the use of virtual reality, wikis and blogs as part of everyday practice. Lamb and Kling (2003) argue that ICT, once adopted into a person's everyday life, becomes a part of that person's identity. It is possible that digitally minded students assume that social media will be part of their learning experience much in the same way as it is part of their overall social context, and will behave accordingly in class. A constructivist response from educators may involve creative adaptations of existing ICT tools (Hemmi et al., 2009).

Healthcare is increasingly seen as a complex adaptive system (as described by Plesk and Greenhalgh (2001)), in which innovations emerge, are adapted, adopted or fail. The University of Auckland has a learning management system that supports synchronous and asynchronous electronic communication between students, teachers and administrative personnel much in the same way MS Outlook works, using email, journal, attachment, discussion and chat facilities. As with most innovations, this kind of system can be adapted for use in unconventional and unexpected ways (Rogers, 2003), e.g. as a form of social medium that supports planned and spontaneous co-creation of learning and teaching. Learning is usually a social experience, at its best equipping people to solve problems, creating new knowledge and giving them the capacity to act in their everyday lives (Howard, Carver, & Lane, 1996). This means that a blended learning approach which involves the use of contextualized, situated learning, scaffolding, and authentic learning based on problem solving, may be most appropriate in teaching health informatics to undergraduate students (Oliver, Herrington, Herrington, & Reeves, 2007).

Adapting social media for collaborative health informatics learning

Teaching health informatics to undergraduate students who expect to use their new skills in the workplace as managers, business analysts, project managers, public health practitioners, and administrators is challenging. These students are not equipped with the vocabulary of healthcare such as clinical terminology, or a sense of the complexity of the health system, its processes, information flows and needs, or typical day-to-day workflows. However, they are digitally minded and use social technologies freely, raising the question as to how teaching methods could be adapted to accommodate and take advantage of these attributes.

In light of von Bemmel and Musen's (1997) definition of health informatics as the theory and practice of health information management, one could argue that there is an overlap between health informatics and

teaching because both involve using information i.e. data or facts that have been processed so that meaning can be assigned to them, to build knowledge in order to act appropriately. From a constructivist perspective, people construct knowledge while learning, by articulating what they learn within the context of their situation and the history that led up to that situation. Colliver (2002) takes this one step further when describing how students build new knowledge upon old as they explore what they know, while in turn creating new applied knowledge. This is supported by Snowden's description of knowledge being a process as much as it is an artifact (Snowden, 2003). Conversations, dialogue and discourse become important in the learning process as students and teachers co-construct learning (Golinski, 2005).

Action research is the cyclic investigation of a research problem, in which an intervention is planned, implemented, reflected upon and modified (Brydon-Miller, Greenwood, & Maguire, 2003). It also lends itself to use in a constructivist context in which new knowledge is articulated based on past and current experiences. Action research was considered appropriate for this research as we needed the capacity to modify the online discussions as we implemented and refined them, to co-construct learning with our students. In this way we mutually learned about the application of health information management principles as we practiced the development of an ICT-mediated social community of students and teachers.

The health informatics course had been running for some years at the University of Auckland for Bachelor of Health Science students. Prior to 2008, we had corresponded with students using email. Face-to-face teaching, supported by self-learning in the form of course readings, was the dominant mode of delivery for the content. In 2008 we introduced the use of online discussions as a scaffolding tool. As experienced clinicians and health informaticians, we were new to social media at the time of introducing online discussions as part of a blended learning suite of tools. As social media novices ourselves, with students who appeared to be more digitally minded regarding online communities, we implemented the online discussions with a view to providing scaffolding while learning how the social medium contributed to student learning. In this article we outline our learning as we adapted the existing online discussion tool as a social medium to support learning for our students.

The following methods were used to assess this use of online discussions:

- A questionnaire to assess the digital-mindedness of the students and establish if they had any experience in the healthcare system other than forgotten periodical visits to the doctor for minor illnesses. This was done on the first day in class, collated and analysed with a report returned to the students in the form of a class profile a few days later. The questionnaire consisted of questions asking about possession of computers at home, mobile phone, mobile music technology, internet use such as online banking or purchasing, if students typed with all their fingers and if anyone had ever written software.
- A formative qualitative review of the postings in two structured compulsory online discussions associated with the two written assignments (academic essays)
- A summative qualitative review of the postings in the online discussions and their associated assignments to assess cognitive content learning
- A questionnaire at the end of the semester to evaluate the online discussions in terms of student perceptions of whether the discussions added value to their learning experience
- A standard end-of-semester evaluation questionnaire asking questions about the course, lecturer and tutor
- Reflections of the teachers on the process and content of the online discussions, what could be done to improve them, and how they contributed to teaching health informatics.

In the discussion forum functionality in the university's learning management system, we constructed a 'Virtual Cafe' to help the students establish their online social presence as advised by Shea and Bidjerano (2009). To achieve this the students were encouraged to tell one another about their favourite movie in the Virtual Cafe so that they could get going with informal conversations in this medium. Emails that had in the past been part of student-teacher communication were now done in this Virtual Cafe, unless the correspondence was clearly private. Announcements from the teachers were also made in the Cafe, rather than in the more formal 'Announcements' function. The online discussions were integrated into each of the two assignments as follows, and illustrated in Figure 1.

Assignment 1 was a critique of the electronic health record and was worth 25% of the course mark. Contribution to the structured online discussion was worth 5 of the 25 marks for the whole assignment (20% of the assignment mark). The students were given a set of readings that were appropriate for the

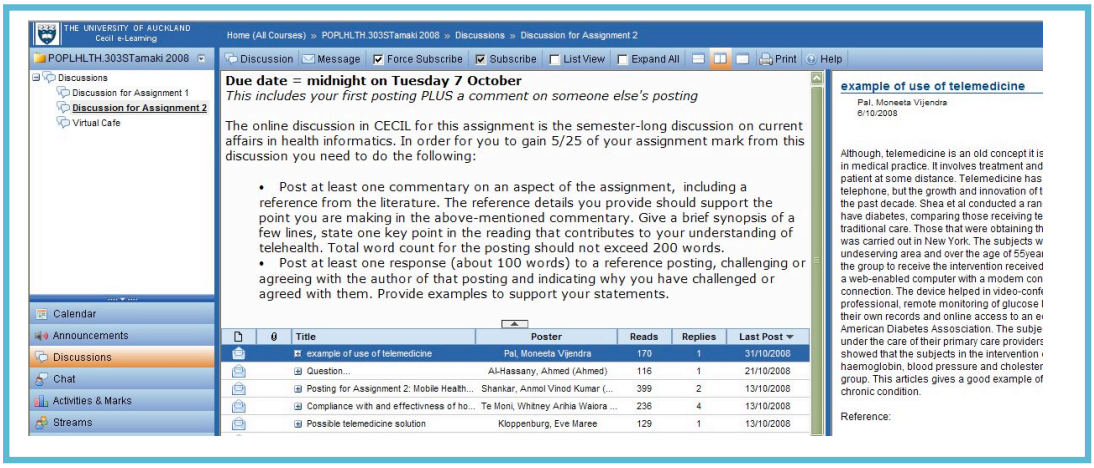

Figure 1: Example of online discussion for Assignment 2

assignment, and groups of three assessed and wrote about one reading each. One person in each group was instructed to summarise their group's article, while the other two provided a positive and negative critique each. The marking rubric consisted of a mark each for posting commentary as instructed, writing coherently about the article's main point, providing a reference for further reading, evidence of critical thinking and commenting coherently and constructively on another student's posting. Students received feedback a week before the assignment due dates so that they could incorporate new learning in their assignments.

Assignment 2 consisted of a review of a telemedicine intervention for chronic conditions, aimed at supporting continuity of care in a district health board. The assignment was worth 25% of the course mark, with 5/25 marks being allocated to the online discussion (as for Assignment 1). The students were instructed to selected a current issue associated with the topic of the assignment, provide a critical commentary online and comment on another person's posting. The marking rubric consisted of a mark each for a coherent commentary, appropriate topic choice, providing a reference for further reading, evidence of critical thinking and posting a comment on another student's posting. Students received feedback a week before the assignment due dates so that they could incorporate new learning in their assignments.

Observations made by the teachers during and after the discussion process were included in the analysis of the findings. The final questionnaire was analysed in its simplest form in an Excel spreadsheet to collate the answers in terms of added value of the discussion to the students' learning experience. Reflections on the process and outcomes were included in the analysis, which made use of general thematic analysis as described by Thomas (2006). The primary purpose of this analysis was to establish if the adaptation of the university's learning management system for use as a social medium, was valuable for scaffolding health informatics learning.

Findings

In the class we studied, there were forty students, of whom 17 were male. They were all in their third year of study, this course being in their last six-month semester. We were not given formal notification of who did not speak English as a first language. However, the Faculty of Medical and Health Sciences does have a support programme for Maori and Pacific Island students, of whom there were six in this class. As part of this programme we tracked these students and referred one of them to the programme co-ordinator for assistance in his studies. Two of the students were among the class's top five achievers.

At the beginning of the second semester of 2008, we compiled a 'class profile' from the questionnaire about digital mindedness as described by Andone et al (2007). This profile helped us assess the student's capacity for peer scaffolding, and their need for targeted scaffolding regarding medical and IT language and application of health informatics principles. This questionnaire revealed a high level of computer literacy and technology use, as summarised in Table 1.

All the students appeared to be comfortable using computers, and fitted the expected profile of digital-mindedness (Andone et al., 2007). Their use of the Internet for finding information about any topic, and specifically about healthcare, was as expected. However, we did not expect to find mature students in this

group, but three students were completing this programme of study as part of major life changes. Because conversations are important in constructing knowledge (Golinski, 2005), it was useful to know that 50% of the students had someone they could talk to outside of the classroom setting about their health informatics learning. In contrast to their access to 'real life' conversations about the topic, these students were evidently comfortable using computers to access information about healthcare (Ministry of Health publications website, PubMed and Medline) and but were unsurprisingly less familiar with accessing health informatics-related information (New Zealand Health Information Service website).

Table 1: Summary of student computer competency profile

Evidence of computer literacy	
Easy access to computers	97%
Owns mobile phone	100%
Uses all fingers to type	81%
Has done a basic course in computer science	25%
Internet usage	
Ever looked up a health condition on the internet	97%
Plays games on the internet	84%
Used the Internet to buy something, or for online banking	100%
Is registered in a social network site, e.g. Facebook	88%
Surfed YouTube	97%
Published anything on YouTube	7%
Contact or personal experience with health providers	
Worked in a GP practice	6%
Has a relative who is a healthcare worker and talks about it	50%
Use of information sources	
Use Google and Google Scholar regularly for studies	97%
Familiar with PubMed and Medline database functionality	91%
Surfed the Ministry of Health publications website	97%
Surfed New Zealand Health Information Services website	34%

This 'class profile' also provided us with an idea of the propensity for social networking among the students. They were comfortable using the Internet. There were signs that most of the students were comfortable interacting with others using social media, as demonstrated by the high number of students registered with a social network website like Facebook, and some students publishing something on YouTube. This behaviour supported our plan to use online postings based on mutual learning in preparation for each of the two assignments.

Collaborative, scaffolded construction of learning in online discussions and group work

The first online discussion was a difficult experience for the students. It appeared that they had not expected to use social media in their learning and struggled to orientate themselves to the discussion activities even though time was spent in class helping them organise into groups and understand what was expected of them. This type of task was new to them and they were not sure how seriously to take the discussion – there was a tendency to over-invest in the task despite the mark allocation, as one student stated in the post-semester questionnaire, "It was very new to me to use the discussions online and it took some getting used to."

Most students overshot the word limit considerably, struggling to summarise their commentary. This resulted in a significant increase in workload for the lecturer and tutor, who contributed to the discussion threads as the students commented, and also in terms of grading. Instead of a brief grading exercise for each posting, it turned into a large formative assessment task in which postings had to be matched

(students in a group did not cluster their postings as instructed) and extended commentary had to be assessed (students struggled to condense their commentary into a half page as instructed). This was followed by a personal email to each student containing a comment on their posting, their mark out of five, and a suggestion for further reading and/or a different way of thinking about the topic of the article they assessed. Having said that, the marks ranged from 2/5 to 5/5 and only one student did not submit any posting at all. Upon reflection, this lack of participation became an early warning sign of students who were potentially struggling with the course. It gave us an opportunity to contact the student earlier than ordinarily anticipated to establish if further support was required. Since the student was in the Maori and Pacific Island support programme he was referred for further assistance.

On the positive side of the experience, the postings gave us insight into how the students were coping with the material. We used the opportunity to enter into asynchronous dialogue, e.g. about aspects of the electronic health record (topic of Assignment 1) that were difficult to grasp or where students simply got it wrong. Occasionally we referred a posting to a practicing expert in a healthcare organisation and returned their reply into the student discussion stream. When the assignments were submitted a week later, we found that it was easier to do the summative assessment as we were already familiar with how the students were thinking, and had already had an opportunity to guide their learning. We were also able to provide more constructive feedback on the content of each assignment, marking them electronically and continuing our dialogue in the assignment itself. We were not able to establish if the assignments were actually of a better quality than those of the previous year as there were too many potentially influencing variables to account for any change. Although we had not deliberately set out to measure any impact of these postings on classroom participation, it appeared that the students were more willing to talk in class when learning activities were part of a lecture session. One student commented overall about the usefulness of the discussions in the following way:

> Discussions were really good prep 4 exams. (1) made sure that I started early, didn't procrastinate. (2) helped to know that you were (or weren't) on the right track.

In contrast, another student claimed that the discussions gave them an easy way of knowing if they had covered the content they needed to cover for their learning.

> It helped because everyone made a summary of all the main points/ideas, so it was easy for me to get an idea of all the concepts just from reading their brief discussions.

In keeping with the action research cycle, what was learnt from Assignment 1 was applied in a second cycle, Assignment 2. The discussion for Assignment 2 seemed easier because we had already been through the process once before. Most of the students resisted the urge to write long comments, and generally provided good responses to the postings of other students. What they liked about this discussion was the sharing of new knowledge and helping one another find good reading material by suggesting articles that may be useful (according to the discussion instructions). The lecturer and tutor were able to comment on the references students provided for one another and offer further reading according to the interest raised by particular points made by students. The workload in assessing the postings was not as significant as for the first discussion, and students were able to incorporate what they learnt into their assignment.

Two things emerged as we assessed the final assignments. Firstly, while the students had mastered the process of this kind of social construction of knowledge, some had also seen opportunities to use the postings of other students in their assignments, apparently not realising that this could amount to plagiarism. One student rationalised the copying and pasting of work from other students' postings as follows.

> Online discussions became sort of an easy way to put together assignments. Many would copy and paste under headings from the discussions and not sure if this is a good or bad thing. Meant that a lot of the time you could use the other peoples' discussion work for assignments.

Secondly, it also became evident that what seemed to be a popular reference, didn't actually exist. Upon investigation we found that the first person to refer to it had introduced an error that made it impossible to find the actual article. Several other students commented on the article, and used it as a reference in their second assignment, further propagating the error. We concluded that despite efforts to scaffold student learning and collaboratively construct new knowledge, some students did not respond appropriately. While we were able to adapt the online discussions to help scaffold learning, create a social presence and

give students an opportunity to collaboratively construct knowledge, they were not always able to use the experience constructively. The time between sending personal emails with the mark for the online discussions and comments, and the assignment due date was very short (one week) which meant that some students who cleared their student email box after the assignment deadline did not benefit from the feedback.

Perceptions of value and lessons learned

At the end of the semester, two evaluations were given to the students: (1) a questionnaire about the online discussions, and (2) the standard end-of-semester evaluation of the lecturer, tutor and course for our university. The results of the standard evaluation about the course itself provided interesting and conflicting results. The 'low level of motivation' score (34.6%) contrasts with the relatively higher score for 'being intellectually stimulated' (61.5%). This disparity could be explained by the sense that the volume of course work was not appropriate; 50% indicated that the workload was appropriate, which correlates with our experience as markers that the workload was significantly higher than in years when the discussions were not used. This is supported by the low rating of how fairly the assessments measured the student's learning (65.4%).

The sense of unfairness could be explained by the perceived mismatch between the effort the students put into their discussion postings and the mark they finally achieved in their assignments. This perception is supported by a comment in the results from the questionnaire about the discussions; they "made sure that I started early." Because it made the students start earlier than they normally would, they perceived a greater investment in the assignment. The students did indeed overinvest in the discussion postings as evidenced by the amount of time spent on preparation. According to the discussion questionnaire the average amount of time spent preparing for a posting was two to four hours, with some students spending more than four hours assessing a single article and writing a posting about it. We expected these postings to be brief and to the point with some thought put into the content, but it came as a surprise that the students had invested what appeared to be an excessive amount of time. However, this could be accounted for by the postings being part of assignment preparation.

Interestingly, the course evaluation reflected satisfaction with the interest shown by teaching staff in their learning (80.8%) and a deepening in their understanding of health informatics (80.8%). According to the discussion questionnaire, the students found the lectures, 'test yourself' exercises and online discussions to be most helpful of the suite of supportive learning tools. Comments in the course evaluation highlighted the value of the discussions: they helped "reduce the stress of preparing assignments", "the feedback was awesome" and "this gave easy access to ask questions of both fellow students and lecturers/tutor."

While the evidence appears to be contradictory about the level of satisfaction, the students made comments on both end-of-semester questionnaires that reflected a sense that the online discussions were valuable. In the course evaluation questionnaire the students were asked what was most helpful for their learning. More than half the students commented on the discussions as being helpful while some qualified this in terms of the nature, speed and quality of feedback received from the lecturer and tutor during the discussion periods. Although no-one used the Virtual Cafe as a social medium for chatting to one another about the course content, or asking clarifying questions about the assignments, it appears that in attempting to use the discussion facility in the learning management system as a social context for learning, the students found that it was stilted, too formal and difficult to use to engage in any form of conversational exchange.

Plagiarism is always a concern in an academic institution. Despite informing the students that assignments would be systematically scanned for copying using Turnitin, the practice was commonly used by a significant proportion of the class. This may have been due to the collaborative environment that we created, where there was a sense that the class was working together, as they publicly critiqued and commented on the reading list, to assist each other to construct their assignments. We were surprised by the extent of the behaviour, even though we had emphasised the University's policy about plagiarism and directed them to the University's website information. We did not explore this behaviour further. However, it did highlight for us, the need to be very clear and explicit with future students about the seriousness of the practice.

Identifying students who are experiencing difficulties is an important part of academic teaching, as student success rates have a direct bearing on both student and institutional welfare (Campbell & Oblinger, 2007). However, academic analytics is not yet widely used in our institution. Being in closer

touch with the students than usually occurs with assignments and examinations, has the capacity to enable early identification of those experiencing difficulties, and thus allow earlier intervention. In this group, we were able to identify several students who were unlikely to pass, and were able to direct extra resources to them.

Discussion

It is easy to find literature that describes, analyses and supports online learning and distance learning as ways of helping students get through their tertiary education programmes. From this literature it appears that online and distance learning are advanced, commonly used, and mostly successful and that flexibility is desirable (de Boer & Collis, 2005). However, Hannon (2009) points out that not all attempts at online teaching are successful and that there are many and complex reasons for failure or resistance to it. It appears that in the context of the research being reported in this article, an assumption of digitally minded students being able to adapt a formal discussion tool into a pre-assignment preparation commentary tool was flawed. Not all people use social media equally and in the case of contributing to the learning process, there appears to be a mismatch between how people use social media in their everyday lives and how they use it in their course work at university. In the case of our research, there was no opportunity for people to be lurkers or to not participatebecause the online exercise had been allocated part of the assignment mark, and students were obliged to participate. This is contrary to how people normally use social media and did not give them an opportunity to be lurkers or to not participate (Vonderwell & Zachariah, 2005).

Having said that, were we able to use behaviour usually associated with social media activity to support students in their learning journey about health informatics? Because they did not have experience in using healthcare vocabulary in the workplace as a starting place to develop a health informatics vocabulary, the discussions gave them an opportunity to use these vocabularies and concepts in conversation in class and online, to contribute to mutual construction of learning (Golinski, 2005). For this purpose we were able to use a combination of face-to-face and online conversations to help students gain the ability to converse in health informatics language.

Our assumption that digitally-minded students would be able to adapt their social networking behaviour to the university learning management system's discussion facility and the pre-assignment task was flawed. Although Web 2.0 is changing how healthcare is done (Giustini, 2006), it is not as easy to adapt one way of doing things in one context to another context. Hannon (2009) makes the point that socially mediated learning involving technology does not necessarily rely on digital competence to succeed. Lamb and Kling (2003) present the idea that once technology is part of a person's everyday life they could conceivably consider it a part of their identity. When adapting one form of behaviour, such as social networking in Facebook, to another context, e.g. a learning management system with compulsory participation associated with course grades, one is working with more than the adaptation of how people use technology. As teachers we were attempting to adapt behaviour that was closely knit with the students' identity and making that shift was difficult on more levels than we had assumed it would be.

In the spirit of action research, knowing what we know now, how would we do this exercise differently if given another opportunity? Social media is changing rapidly in unpredictable ways and the environment in which we use it morphs as use becomes habit and taken for granted. Lamb and Kling (2003) argue that as changes occur in the environment in which technology is implemented, so too will other factors of how people absorb technology as part of their identity and how they form affiliations with others affect future use. We, the teachers, are no longer novice users of social media, having ourselves enrolled in a number of professional and personal online networks, e.g. LinkedIn, Facebook, and www.hive.org.nz. As we adopt technology as part of our teaching identity, and embed the use of social media in our practice as teachers our own use of these media shifts, changes, and becomes refined. Other teachers around us have begun to adopt social media as part of their suite of teaching tools, in the familiar pattern of diffusion adoption as described by Rogers (2003), where we have been the early adopters.

What is the value of using social media in teaching health informatics to undergraduate students in terms of scaffolded learning? Students perceived value in the discussions, but over-invested in terms of time and effort. They valued the ability to converse with the lecturer and tutor outside of the classroom time, and highly valued the feedback they received during the discussion process. Although the workload for both students and teachers appeared disproportionate at the time, the ability to participate in the process was valued. If social media are a part of everyday life, then they are available for authentic learning, and possibly should be considered an important part of how people learn. They give us the opportunity to wrap structure around conversations, facilitate asynchronous and synchronous communication, and help

students and teachers co-construct knowledge by means of meaningful discourse, as described in the model created by Gilbert and Dabbagh (2005). The fluid and informal nature of social media supports the use of scaffolding in new and interesting ways. Students are able to scaffold one another's learning in mutual construction of knowledge while being supported by teachers and experts participating in the conversations. The next step is to extend the conversation to the world by means of a blog or professional online social network.

Conclusion

In the course for health informatics we aimed to help students learn about the topic by giving them an opportunity to prepare for their assignments using an online discussion facility in the university's learning management system. We attempted to adapt the way our digitally minded students used social media in their everyday lives to discussing online their preparation for their assignments by giving them instructions for a structured discussion online for part of the assignment's grade. The students valued the discussions but felt that the workload involved was unreasonable, as did the teachers. The formality of conversation created by the need to involve all the students (by means of an incentive) as well as the structure and functionality of the online facility itself, did in some ways prevent the students from using the software the way they usually used social media. Our conclusion is that social media are useful and valuable in supporting authentic learning. However, in an environment that initially did not support this use of technology it was difficult for students to make the adaptation at first. Knowing what we know now, the next step is to explore the match between teacher capability in social media use and that of new students who, each year, appear to be more digitally minded than those who come before them. Further research should also explore ways of reducing the workload implications while simultaneously increasing the availability of teacher and other expert support, the implications of compulsory online conversations among students and teachers to support one another while learning, and the development of a supportive learning community for authentic learning (which may or may not include experts all over the world via an online network).

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