

Applying knowledge management concepts to engage students in an undergraduate online learning community.

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***Abstract:** This article presents a case study of blended learning and teaching in an undergraduate course in business economics. The online component was used as a live experiment in knowledge management, with volunteer students forming a Knowledge Management Committee (KMC) to work with the Lecturer, who took on the role of Chief Knowledge Officer (CKO). This experience is analysed in the context of the literature on organisational learning and communities of practice, with particular focus on common identity and common bonding in online communities. Evaluation of the Case within the theoretical context developed, argues for the adoption of a knowledge management approach, with program level online communication, as well as course-specific websites. There is scant evidence of this approach in the Engineering education literature. Peculiarities of each setting also argue for ongoing monitoring of the education experience, through qualitative and quantitative methods.*

Introduction ^a

As past students, we remember and respect those who made special efforts to reach out and touch our imagination. As educators, we care about the impact we have on our students (Turns et al. 2007; Hawk and Lyons 2008) and we struggle for ways to accelerate and deepen the absorption of concepts, theories and methods. And as researchers, we aim to document the approaches taken, in order to build models and theories to help practitioners better reach out and touch from different directions the imagination of future students.

For example, it is likely that often a fellow student can convey a particular concept more directly, perhaps by using a form of language common to the students but not known or practiced by the teacher. In this example, one student would have understood the concept and then acted as a conduit of (accurate, one hopes) information or knowledge between teacher and the other student, providing an extra stimulus for absorption. At the same time, a *personal* bonding is occurring that reinforces the value of the more *institutional* setting of the specific course.

That, in effect, is the practical working out in an educational setting of the common bonding vs common identity dynamics in online communities in general (Yuqing et al. 2007.) Combining this with practice and theory from the knowledge management field can yield a powerful framework for improving the educational experience, as well as better preparing our students to add value more quickly once they enter the workforce.

In particular, Brown and Duguid (1991) state that working, learning and innovating are complementary activities. Inasmuch as we can offer scope for studying real/live problems, we can provide a return in real time for those who are facing the problem, but also accelerate and deepen absorption by appealing to kinaesthetic methods as a complement to the more traditional styles hence stimulate students in several modes (Palmer 2002; Bourne et al. 2005; Kratzig and Arbutnott 2006). It is also the nature of narrowly discipline-based education research that we need to dialogue with other disciplines, borrowing theory, contextualising it and feeding it back to the general creation of knowledge (Fincher and Tenenberg 2006; Zahra 2007)

The next two sections, expand the theory behind the approach in the two articles cited above (Brown and Duguid 1991; Yuqing et al. 2007), deriving a framework for developing an online community of learning. Then follows a case in developing an online community within an education setting that applied relevant organisational theory. Finally, the recommendations draw together theory and the case.

Common identity and common bonding in online communities.

Yuqing, Kraut and Kiesler (2007) draw on literature from the social sciences to derive tentative principles for the design of online communities in general. The two approaches – identity and bonding – refer to whether community members feel relatively more attached to the group as a whole and to its content (common identity), or to other individuals in the community (common bonding.) Both of these forms of attachment do keep the community alive and provide energy, but they also lead to different forms of interaction and behaviour norms, and have implications for design.

For example, in an identity-based community there would be less interest in and tolerance of discussions away from the community's central topic. On the other hand, the social or personal discussion that would occur on a bonding-based community is exactly what keeps it alive, not unlike the concept of social presence in online courses (Rourke et al. 2007). In the former environment, **off-topic discussion** would be considered distracting *chit chat* and would add clutter to the topic of common interest.

If one wanted to create a mixed form of environment, the community designer would perhaps allow separate discussion forums for the personal (or, off-topic discussions) to occur.

The **induction of newcomers** into the community will also differ based upon the type of attachment that is in place, or is sought. In an identity based community, newcomers would be socialised into types of behaviour that are accepted (eg the policy on off-topic discussions), as well as easing them into the active discussion. It would be easier to find information about *topics* in the site. In a bond based community, newcomers would receive help to find information as much about *people* in the site, in order to make connections and build relationships.

Yuqing, Kraut and Kiesler (2007) suggest that mixed preference communities use direct mentorship, to help newcomers find their way, while ensuring their contributions are appropriate for the community.

The topic of **community size** and growth is relevant to educators on two counts: depth and intimacy of discussion are lost when the community gets too large; course enrolment is a form of screening.

The authors present evidence to show that larger online communities experience more turnover and that screening of potential members was observed to lead to better quality discussion (eg JoBlo's Movie Club: <http://www.joblo.com/>)

They refer to **core members** as the critical mass of the community. As the most frequent and loyal contributors, they also have greater expertise than most and are accorded higher status. Often they become moderators in voluntary online communities (Brown and Duguid 1991; Fulmer 2003) hence imparting knowledge to the newer recruits, somewhat like traditional master-apprentice environments.

The design challenge is then how to maintain the stabilising influence of the existing core members, while allowing the more peripheral members to grow in presence.

Finally, Yuqing, Kraut and Kiesler (2007) also analyse the question of whether **sub-groups** should be allowed or encouraged. Sub-groups can undermine the broader aims of the community, but they can also allow greater diversity of topics to be discussed. They provide an avenue for the new leaders, future core members, to develop, and potential new communities to grow and be spun out. They are, however, more aligned with bond based communities than those based upon identity, and they appear similar to the 'breakout and reassemble' feature that Etzioni and Etzioni (1999: 245) consider important for community building, though it is not often found in online communities.

Just as Yuqing, Kraut and Kiesler (2007) consider that online communities can develop a mixed identity- and bond-based synergy, Etzioni and Etzioni (1999) construct an argument that a combined face-to-face and online elements can build communities better able to bond and share values.

In this section, we have considered the work of Yuqing et al (2007) inasmuch as it is relevant to our purposes, with focus on: newcomers; off-topic discussion; community size; core members; subgroups. We next briefly explicate elements of organisational capabilities and knowledge management.

Organisational learning and communities of practice

Brown and Duguid (1991) highlight the importance of communities of practice in overcoming short sighted policies in large organisations, to the point of arguing that once firms conceive themselves as communities of communities they can overcome their apparent inability to innovate. If then those communities can span across organisational boundaries, innovation potential is expanded. This is bordering on the concept of ‘open innovation’ (von Hippel and von Krogh 2003; Chesbrough 2006), although Brown and Duguid (1991) do not explicitly use the term.

The authors argue that firms need to find ways of overcoming the tensions between the tendency to down-skilling (eg by providing manuals with complete descriptions of how to fix machinery on customer sites) with a need for improvisational up-skilling (eg because the manuals can never cover the complexity of situations in which the machines are situated.) The difference is made up by an informal network of people with similar interests, problems, as well as related knowledge that can be pieced together to solve common problems. If the firm is oblivious to the community, the exchange of information will often occur informally via ‘war stories’ disseminated in cafeterias, or other places of congregation.

Communities of practice are similar in nature to communities of inquiry (Anderson et al. 2001; Garrison et al. 2001; Rourke et al. 2007) so we can achieve synergies across practice and content of our learning and teaching effort, as well as to researchers (Fincher and Tenenbergh 2006).

Relevant literature has been presented in the sections above. The case study is in the next section.

The Case

Within a Business Economics course, **the objective** was to teach concepts of knowledge management (KM), while implementing them in the class. So, in teaching and learning KM in real time, the overriding task was to achieve any possible synergies among the students, by reducing impediments that could inhibit value-adding interactions.

A first step was to ensure students became aware of their colleagues, their background, their capabilities and to eliminate barriers between them (Foor et al. 2007). Other objectives: show how the theoretical and practical aspects of economics, management, education, IT and law (intellectual property) relate to each other; allow students to appreciate the benefits and difficulties of knowledge-sharing in a networked organisation; engage students and bring energy into the subject; generate topics for discussion in face-to-face classes; help the spontaneous formation of study groups, self-organizing teams, for work during the semester, where community of interest was discovered; showcase examples of excellence among the student body for benchmarking and raising standards

From **an operational perspective**, a formal Knowledge Management System (KMS) was constructed, bearing in mind Chickering and Ehrmann’s (1996) ideas on how technology can help implement the seven principles of good practice in undergraduate education and the findings in Davenport *et al* (1998) on what made for “Successful Knowledge Management Projects.”

Fifty-five students completed this course. It had been until then a traditional face-to-face subject. A website was introduced for the first time on this occasion, but the first half of the course was taught in traditional format – indeed, the lecturer delivered classes sitting down.

A Knowledge Management Committee (KMC) of students advised and worked with the Lecturer-CKO (Chief Knowledge Officer), who took notes at KMC and implemented decisions. Students sourced donations from businesses, as prizes for contributions to the KMS. The ‘humour’ prize went to a student who served a summons on the Lecturer for defaming lawyers, or law students, in class.

The online structural elements of the KMS were:

- Public bulletin boards, for each section of the course, and one called Your Opinion on Real Business, for items that did not fit comfortably elsewhere. During the course of the semester, more bulletin boards were created as a critical mass of messages were posted on a new topic: Flinders Topic Exchange; Exam Thoughts; Class Dinner
- Private bulletin boards for any group that requested it, including one for the KMC
- Email tool and Chatroom
- Special pages for: all group projects to be posted; six selected essays, by individuals, posted for students to benchmark their own effort with some of their peers' (received 115 hits); PowerPoint slides, following student request (received 131 hits.)

In one series of communications, Cristina (fictitious names used) had sought advice on which courses to take the following year. Susan and Jean responded. They had never met in person. A knowledge management analogy with the World Bank was drawn in class. Susan would sit at the opposite end of the lecture theatre to Cristina: they could not have been geographically more distant (important for considering the adoption of online tools (Maier 2007).) The Class-as-organisation had developed (Cohen 1976; Conklin 2009; Sheehan et al. 2009). When asked if she trusted the advice of a person she did not know, Cristina replied she didn't think a fellow student would deliberately give false information, but that she had received similar advice offline. Trust, and a sense of community, were growing, hence reducing coordination costs (Becker and Murphy 1992)).

We also discussed why Susan should bother to help others the way she did. She was not present, but somebody said: "Because she's nice." Susan later admitted that her altruism had been aided by the prospect of extra marks, the CKO's prodding and commitment to such interchange, and that it would not have been possible without relevant technology. She still did not know the student she had helped.

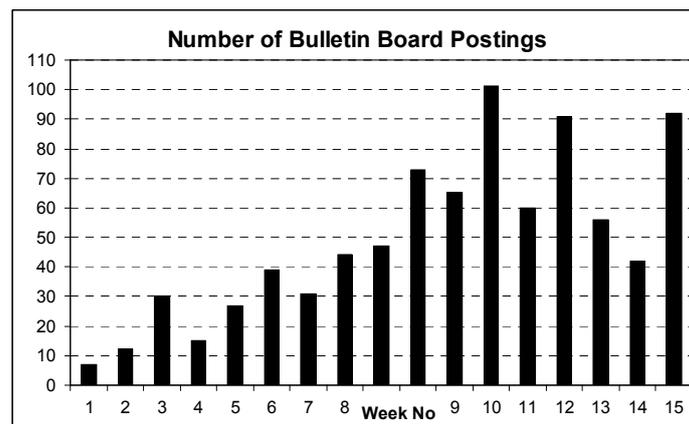


Figure 2: Number of Bulletin Board Postings, by Week of Semester

Peaks occurred when particularly interesting – and pressing - topics were being discussed: Flinders Topic Exchange; Exam Thoughts; Class Dinner. Discussion continued up to and a little beyond the exam. For example, Weeks 14-15 in the Figure occurred after all lectures and tutorials had terminated. The peaks in Weeks 3 & 6 were due to activity in the KMC, first as it was getting organized, then as others joined ahead of my lectures commencing.

Students were compensated for sharing their insights, and quickly became aware that they were virtually *required* to do so. This fell under the assessment item “**Contribution to topic success**” combined with the requirement of gaining at least 30% on each piece of assessment, to achieve a Pass.

Discussion, conclusion and recommendations

If the criteria that appear to make for successful KM projects in Davenport *et al* (1998) are any indication, the pre-conditions for the project to succeed were in place. An asterisk appears next to the criteria that “appear to be the most important” (Davenport et al. 1998: 55.)

Link to economic performance or industry value	The project related to a section of the course, hence might have helped students understand it, and was shown to be relevant to <i>the real world</i> , which these students were, for the most part, about to join.
*Technical and organizational infrastructure	We had a website, with areas set aside as KMS and a structured set of bulletin boards; KMC of students helped support the initiative.
Standard, flexible knowledge structure	The bulletin boards were clearly defined, yet evolved as new topics became more or less relevant. Documents in Word and Ppt format.
*Knowledge-friendly culture	'Lead users' existed, more inclined to share knowledge and some were keen/able to strive for high grades, but this was an unusual exercise for the participants; university is a knowledge-friendly place.
Clear purpose and language	Students read the Statement of Assessment Methods carefully; some confusion remained, due to the novelty of the system.
*Change in motivational practices	Marks are an effective motivator; students' contributions were used as basis for discussion in the classroom; the prizes were not envisaged at the beginning of the project – a bonus.
Multiple channels for knowledge transfer	Face-to-face classes co-existed with the electronic interface; informal interaction occurred; KMC used old transfer technology – meetings.
*Senior Management Support	Not only was there support, but the lecturer in charge actively and continuously pushed for it – CKO was also CEO.
Table 1: Benchmarking the Case against criteria for successful KM projects	

There is scant evidence of this approach in the Engineering education literature. The exercise successfully aided in showing interconnections across course concepts. Open-ended answers to the evaluation survey typically pointed to the online component as 'the best aspects' of the course, consistent with studies from a different, yet related, context (Palmer 2002; Hussmann and Smaill 2003). The Case displays good levels of teacher, social, and cognitive presence and illustrates the theory presented. Overall, **it was fun**, for Lecturer and students alike, and if we can make the pursuit of knowledge enjoyable, that is a great satisfaction. The qualitative research method adopted is very important and consistent with extant literature (Anderson et al. 2001; Garrison et al. 2001; Fincher and Tenenbergh 2006; Foor et al. 2007)

Based on the Case experience, its connection with relevant literature and new directions in the University sector, the following practices are recommended: adoption of the KMS approach, encouraging both bonding and identity based interactions; development of program level websites, possibly using social network technologies; evaluation and future research via SELT, as well as real-time and retrospective analysis of course experience, using focus groups and content analysis, to ascertain ongoing value of the approach to specific environments.

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