

## Fostering Collaboration and Benefiting from Blurred Boundaries Between Students and Academics

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Subject area: Electronic and Computer Engineering; Network protocols.

This case study has been developed from data gathered through observations of the teaching component; interviews with the tutor; a questionnaire to students and a student focus group.

### Background

This case study presents evaluations of two distinct uses of "Web 2.0" or "Social Networking" applications in teaching electronic and computer engineering: the use of a wiki during exam revision so that students can work collaboratively on answering past questions; and the use of Twitter, a wiki and online learning logs as tools to facilitate project supervision. While the rationale and type of software used in the two cases are similar, the students are entirely different. Those using the wiki for exam revision are second year undergraduate students, mostly home students who have entered university directly from school. The project students are final year undergraduate or postgraduate students on a masters-level course, with a significant number of the postgraduate students being from overseas. Due to the nature of the subject, all students have a high degree of computer literacy. Also, all will have used some social networking tools in their social life, however they may not have used such tools for formal learning

The wiki used for exam revision goes by the name of "Examopedia". The tutor creates pages on the wiki containing the questions from past exams in a tabular form; all students have read/write access to these pages from their own computers during exam revision time. Below each question is a cell where students may enter their answer. This answer may be added to or edited by other students, who can comment on the existing answer, make what corrections they think are necessary, or submit an alternative solution. The tutor can also comment on the answer as it develops, and so may approve it or clarify points of confusion. There is also a facility for real-time chat between tutor and student if both happen to be logged in at the same time.

The tools used for project supervision are Twitter, which is used for very short progress updates or queries (140 characters or less), a wiki which can be used to post and collaboratively edit larger items, and online logs or e-logs, which are used to monitor the progress of the project. The three tools are complementary in their degrees of immediacy, privacy and the detail that can be conveyed using them; with Twitter being the most immediate but least private and capable of conveying least detail, e-logs being private and detailed but less immediate. The wiki is used to host the work in progress, which can be referenced in Twitter to allow for more detail and which is used to host the completed e-log; files on the wiki may be private or shared at the student's discretion.

### Reasons

Exam revision and project work are both situations where students go through similar activities but tend to be isolated both from one another and from the tutor. The tutor felt that both were situations where students would struggle on their own when there would be educational (and sometimes emotional) benefits from them helping each other. From his own point of view, both were situations where it was difficult to identify which students were struggling and needed help. When students did express a need for help he would often explain the same point over to several students independently when it would be more efficient to for him to explain it once to all of them, and indeed educationally more effective if they could explain it to each other. His own experience as a distance learning student on a professional development course had shown him how web 2.0 software such as wikis could provide the pedagogical benefit of collaboration within a group without requiring that the group be working at the same time and place. The differences between the two situations are that for exam revision the tutor found that most students were doing the same thing, i.e. working through the same

past papers, whereas the project students would all go through the same processes (of literature review, defining the problem, and so on through to writing the project report) but the details of what each student did were as different as the projects were. Also the timescale for the projects is longer and so there is a greater need to monitor progress.

For the exam revision work a simple wiki provides all students with access to the problems from past papers and, being a read-write wiki, gives them the space to input their own answers and collaborate online. The project students needed a more sophisticated approach, with Twitter giving a communal space for the immediate sharing of experiences, hopefully building a community of interest, without encroaching on other spaces (e.g. Facebook) that students might be using for their own social interests. The wiki allows sharing of more substantial pieces of work, either with the group or just with the supervisor, which the student can link to when posting to Twitter. The e-log provides an ongoing record of the conversation between the supervisor and the project student, making sure that nothing is forgotten and time isn't wasted going over the same issue more than is necessary.

### **Lecturer's Perspective**

Having decided to use a wiki for past exam papers, setting up Examopedia was relatively straightforward. The tutor had previous exposure to wiki technologies, and the University where he worked already had the software installed. "The technology is very simple. It's just as simple as clicking a button, typing in some text and then clicking another button." While the wiki software was being used to post committee minutes, or by some lecturers to post information for students, this was the first use of that wiki as a collaboration tool: previously students had read-only access, for this work it was significant they had write access giving them "a say in whatever they're doing, whatever they're learning". Soon the Examopedia section of the wiki became the most used pages in the whole university. Having entered the past exam questions into Examopedia, with some explanatory text, the tutor tells the students what is available, how they may use and explains that it is up to them to contribute with answers and queries. He monitors their contributions, stepping in to resolve conflicts, show how different answers reflect related aspects of the problem or confirm when an answer is complete; usually this activity is concentrated near the time of the exam, and is not too onerous. More support might be required should no student be able to attempt the question, or if everyone in the class is confused about the subject; when this occurs the tutor is able to identify and provide the necessary support on the wiki during a time (the exam revision period) during which this would not otherwise be possible. There were some initial problems, firstly with the structural layout of the pages leading to some students experiencing difficulty in finding the right information. More significantly there were some editing conflicts if two students edited the same text at the same time. The Wiki does manage these conflicts by saving one contribution as a different version, however the students weren't aware of this.

The technology used for project supervision was also simple to set up. For the first year of trying this approach just the logs were used, then the next year Twitter and the wiki were introduced to complement them. The main problem was with trying to change students' working practice "it's a cultural thing because some students don't maintain logs, even if they're in their final year". The tutor introduced Twitter to encourage students to make regular update posts, and intended that the format of the e-logs would provide a template for formalising these. These complementary formal and informal reporting channels also appeal to different types of student. Both Twitter and the e-Log show what support was requested and provided as a sort of timeline; the wiki provides for a single document that evolves over time through different versions until the final definitive version is reached. The interaction through these tools allowed the tutor to recognise types of student different in terms of their approach to seeking help and advice (which he characterises as the poser, the independent, the collaborator and the dependent), and provide the different type of help that they require. Three colleagues of the tutor who have adopted these tools for project supervision at his suggestion have also found that the benefits justify continuing to use it with their masters-level students.

### **Students' Perspective**

The response to the survey for Examopedia shows that most of the students (17 out of 28)

agreed that it is useful, it came second to lectures as the most helpful source of information for studying the course; the same number of students agreed that Examopedia helped them collaborate, and 19 students agreed that Examopedia gave them access to the collective intelligence of the class. Of course such a revision tool won't appeal to all students since not all students take the same approach to revision: there is evidence that some students did not feel the need to use Examopedia (approximately 7 out of 29). As well as the simple benefits of seeing past papers and so getting an idea of what they would face in the exam, students liked that they could see the way in which other students tackled a problem, so that they "[got] a better understanding from other people's answers", "[got] a clear idea of what my peers knew and level they were working at" and "[felt] better as I knew people had same issue as me". In the interview, students recognised that the effectiveness of Examopedia rests on contributions from other students.

"It's a really good idea ... if you all participate and like contribute to questions and stuff, if no one does that then it's not going to work."

The students also thought that there might be reluctance by some to be the first to provide an answer.

"Some people don't want to put their answers up because they might think that they've got the wrong answer or it's silly. It needs someone to just sort of go for it, put an answer up and then other people will reply to it."

They also appreciated the feedback available from others students and the lecturer.

"There are some questions where three people have posted and then Manish replied to it with another thing and then those were like 'oh I didn't think of that' and then five other answers came out of it as well and it's good to see everyone's take on what they think the answer to the question is."

Students found this sort of interactive approach to solving problems better than being given model answers from the start, which they said lead to an approach of "memorising" answers to past questions. There was some discussion in the interview about whether the online discussion forum for the course could have been used to the same effect as Examopedia, with some students irritated at being given another, disconnected system to use but others appreciating the Examopedia offered different facilities.

The project students who were interviewed understood and appreciated the relative capabilities and benefits of the three technologies they were using: they characterised Twitter as "real time" interaction, faster than email, and a form of open broadcast; the wiki as shared and evolving "one document that you can both access and both make changes to" and suitable for more expressing more complex ideas; and e-logs as a means of recording the project's progress. Even though they were new to Twitter they found it convenient and easy to use, as was the wiki, though they too found it unpolished. They also understood the tutors aims in using these tools "he's trying to encourage more peer support between project students as well because we learn as much off each other as we do from just asking a lecturer questions ... We wouldn't have any interaction [with each other] without these tools." No student in the interview had a problem with the lack of privacy on Twitter or the wiki (though there was some realisation of the potential for plagiarism from the wiki), and although some used Twitter socially none found that it's use for work intrusive. There was some recognition that the public nature of the communication had benefits: "it's good for brainstorming", "you might be asking [the tutor] a question that is going to answer a lot of questions for other people as well". They also recognise that employers value collaborative effort in a shared space, for example when developing software code.

## Issues

- The students find the interface to Examopedia unpolished, saying that "it could be more user friendly".
- If the students do not engage with these approaches they will fail; for example, if no one starts an answer on Examopedia there will be nothing to build on. However the evidence is that

enough students recognise that contributing brings them greater benefit than reading other people's contributions for this not to be a problem here.

### Benefits

- Students act as a team, collaborate, pooling their learning experiences and opinions in a way that is open to the tutor who has the authority to provide feedback.
- The feedback can be provided rapidly, either from other students or the tutor.
- Provides educational and emotional support to students at times when they could otherwise be isolated.

### Reflections

The tutor characterized his approach as "looking at an individual student and guiding their work and criticising their weaknesses or giving them some positive, constructive criticism. The technology is an enabler." The technology that he has chosen to use are relatively new forms of social technology, but he has been successful in matching the characteristics of these technologies to his aims. While he has done this in a spirit of experimentation there has been no indication that students think this experimentation is gratuitous, rather they recognise that he does this because "he wants us to be more engaged in the course ... because a lot of people would just sit there and kind of just float through and zone out through all the lectures, he wants people to participate a lot more".

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