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# **An Analysis of third level multi-cultural interdisciplinary student learning outcomes using Wiki technology**

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## **Paper Type**

Practitioner

## **Abstract**

The increasing need for effective collaboration among interdisciplinary groups suggests the necessity of developing teaching pedagogy that infuses teaching techniques with technologies. Combining Business and Engineering graduate expertise is paramount in developing skills set for high end product and service innovation. Opportunities also arise if groups have experience and familiarity with other cultures. A collaborative teaching tool that can combine business, engineering and cultural opportunities is Wiki. Wiki provides an environment that enables students to contribute to a web page in a collaborative manner. The Internet based Wiki provides a many advantages including a platform for connecting students from around the world who can work together in a virtual way.

## **Case Study**

This case study analyses an undergraduate target module titled '0809-IE319: Operations Strategy' Face-to-face teaching and the learning environment was supported by the NUIG Blackboard virtual learning platform which utilised the *Learning Objects Teams LX* building block to create group wikis.

Graduate expertise is paramount in developing skills set for high end product and service innovation. Opportunities also arise if groups have experience and familiarity with other cultures. The Operations Strategy module combines approximately forty 3<sup>rd</sup> and 4<sup>th</sup> year Business and Engineering students from Ireland (58%), EU States (29%), the United States (10%) and the Far East (3%) comprising 55% female and 45% male students. A key element of the student learning environment centres on individual, small group and whole group activities aimed at developing problem-solving approaches and strategies to resolve issues indentified across a range of case study scenarios.

Inter-disciplinary and multi-cultural groups are set up at the commencement of the module. Groups are then allocated a wiki which serves as a communication and collaboration space to develop group responses trigger questions. During class contact time, a common case study is distributed to each group for analysis and discussion together with a number of trigger questions for group consideration and group

resolution. Groups are asked to upload their co-constructed response via their group wiki in real-time. Groups are then invited to present their summary responses to particular question to trigger whole-group discussion. While wiki membership editing rights are restricted to the immediate group, all members enrolled in the module can view each other's wikis. This opens up the prospect of peer-review and evaluation exercises and allows knowledge sharing amongst the wider cohort.

The principle wiki activities take place in the classroom setting. However, wiki access is available outside the class contact time for further edits, additions, comments and reflections. All group members have permission to export a .zip file copy of their wiki and this can be used to demonstrate team work and collaborative working practices to external stakeholders, such as potential employers.

### **Evaluation Methodology**

This case study was evaluated using student questionnaires, group reflective exercises, individual student video interviews and lecturer video interviews.

#### **1 Affordance of the Technology**

While 84% of the students had not used a wiki prior to this module, a entire student cohort found the wiki software easy (58%) or very easy (42) to use. It was easy to edit (95%) and add (87%) a new wiki page. There were some issues concerning the formatting of text that had been copied from MS Word into the wiki space. Students contributed reflective comments such as:

'I am not great at computers but it's really easy to use the wikis.' [Student 1]

'It's very very easy; very very simple.' [Student 2]

The students found that the technology was stable (90%) and were very pleased with the 24/7 access to their group wikis (96%).

#### **2 Collaboration**

The students explained how they used the group wikis:

'We use the group wikis to tie in the class theory with practical case studies. It gets you to think outside the box. You think 'this is the real world.' [Student 3]

'We can edit together as a group in class, and then go afterwards and contribute online strategies amongst the team. We use the wikis to coordinate groups so that we can get together outside the classroom. It has transformed the learning from two hours in class to several hours outside the classroom.' [Student 4]

'The wikis builds up into a portfolio of case studies, strategies and ideas. We can then compare and the various strategies and approaches.' [Student 1]

### **3 Co-Construction of Knowledge**

The students appreciated the benefit of working in groups and clearly identified the 'real-world' relevance of replicating industry scenarios and problem-solving activities in their Operations Strategy module:

'It's about learning by doing; by interacting and getting ideas from other people. We have shared our details within the group. It's a challenge to work in a group but it's also fun. If there are conflicting issues, we can challenge them as a group and come to a consensus.' [Student 3]

'The wikis allow multiple ways to come up with a final answer and opens up new ideas. It's a great way to get group and class feedback. You learn a lot from that. It's a good challenge for future life and working in industry.' [Student 2]

Additionally, the international mix of students was clearly seen as an advantage to inform problem-solving approaches:

'We have a mix of Irish and international students. We have an American guy in our group and it's a really interesting mix. He provides a totally different view to us. It's great to learn from people with other backgrounds and perspectives to approach a problem.' [Student 7]

### **4 Engagement**

Students liked working in groups and say the relevance of using their wikis to aid their activities:

You are helping your classmates. It helps to learn how to work in a group which is essential for project work. It's definitely a better way of learning because it's practical and more of a real working environment. [Student 6]

The students identified opportunities to apply their learning to wider contexts:

When in other classes I'm thinking: 'there are better ways to do this' having used wikis in group situations. [Student 8]

I did a placement with Boston Scientific and will be returning there in the summer. Wikis would be great to use with colleagues in the United States. I could see that this could work very well for collaborative projects between Galway and Boston and if you were dispersed throughout the company.

Students commented that a motivating factor in their engagement with the environment was the opportunity to take a personal copy of their wiki to showcase their achievements to external audiences, such as potential employers.

The following comment indicates student use of the group wiki to aid personal reflection on learning and knowledge gained through the learning activities:

'Because we can access the wiki permanently, and take our own copy of the wiki, I can look back see what I wrote and how I wrote it. That's when I'll really recognise the leaning.' [Student 4]

Course Coordinator Mary Dempsey felt that the use of wikis has proven successful in facilitating knowledge construction and exchange:

'The Operations Module has really engaged the students. I have had a wonderful time observing the group dynamics and evolving problem solving approaches demonstrated in the class. The wiki tool was seen as cool and novel, and very much supported the real-world element of the course. We aim to expand this module to incorporate a student cohort located in Germany for the 2009-10 academic cycle.'

## **5 Conclusions and Future Plan**

The responses indicate that incorporating Wiki as an on-line collaborative tool resulted in extremely engaged students who became self motivated both inside and outside the classroom. The responses also highlight that the learning outcomes set at the start of the semester were achieved. The results suggest a deeper understanding of the course materials when compared to rote memorisation as students deepened their engagement and are required to use some of the higher level cognitive styles from the Bloom taxonomy. The Groups also rotated the leadership role and this facilitated group problem solving, communication and leadership skills enhancement. Disadvantages of integrating Wikis into teaching were minimal. In July 2009, the authors plan to create additional European and International Wiki platforms consisting of multi-cultural interdisciplinary student teams. It is planned that a project of this nature will take place in semester I, 2010 whereby students in Chemnitz University, Germany will work in partnership teams with NUI Galway students on Operations Strategy case study evaluation and use Wiki technology to collaborate on-line.

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