

# Innovative Collaboration

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## Abstract

The focus of this paper is Innovative Collaboration and how this is achieved through using the successful assimilation of Moodle into the blended learning environment. Moodle is a course management system (CMS) - a free, Open Source software package designed using sound pedagogical principles, to help educators create effective online learning communities<sup>1</sup>.

Teaching and learning in any subject can sometimes become mundane but in order that our students are motivated it is sometimes necessary to use an approach which makes the process more innovative. Over the past year a study has taken place with students from Edge Hill and the University of Limerick in Ireland in the teaching of Professional Issues in Software Engineering (PISE). PISE focuses on the legal, ethical and social aspects of computing. The ethical strand of this module, which aims to develop moral reasoning in the learners, has often proved to be the most difficult for students to grasp and consequently has had a de-motivating effect on some learners.

The method adopted has been the use of virtual learning groups using internet based communication tools to enable learners who would otherwise physically be unable to meet, to come together in cyberspace and discuss moral issues relating to computer systems.

This paper describes one completed cycle of the study, the results obtained, lessons learned and how that has informed the approach to be used in this years study.

## Philosophy of Moodle<sup>2</sup>

The design and development of Moodle was guided by a particular philosophy of learning, a way of thinking that is referred to as "social constructionist pedagogy".

The constructivism point of view maintains that people actively construct new knowledge as they interact with their environment. Everything that is read, seen, heard, felt, and touch is tested against prior knowledge and if it is a viable concept, may form new knowledge that one may carry with them. Knowledge is strengthened if this is used successfully in a wider environment.

Constructionism asserts that learning is particularly effective when constructing something for others to experience. This can be anything from a spoken sentence or an internet posting, to more complex artifacts like a painting, a house or a software package.

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<sup>1</sup> <http://moodle.org>

<sup>2</sup> <http://docs.moodle.org/en/Philosophy>

Social Constructivism extends the above ideas into a social group constructing things for one another by collaboratively with one another. Members of this sort of group are learning all the time about how to be a part of the collaboration. So when in discussion the motivations of individuals are examined in more depth.

### **Separatist, Connected and Constructed behaviour**

Initially the individual members of a group try to remain 'objective' and 'factual', and tend to defend their own ideas using logic to find holes in their opponent's ideas – a separatist approach. Connected behaviour is a more empathic approach that accepts subjectivity, trying to listen and ask questions in an effort to understand the other point of view. Constructed behaviour is when a person is sensitive to both of these approaches and is able to choose either of them as appropriate to the current situation.

In general, a healthy amount of connected behaviour within a learning community is a very powerful stimulant for learning, not only bringing people closer together but promoting deeper reflection and re-examination of their existing beliefs.

All of these issues help focus on the experiences that would be best for learning from the learner's point of view, rather than just providing them with information that they need to know. It can also help realise how each participant in a course can be a teacher as well as a learner.

Moodle itself doesn't make people behave in a certain way, but it is the use of moodle as a virtual learning environment (VLE) that supports the collaboration between them. Moodle was used with a group of third year students on a module that was concerned with the legal, social and ethical implications of computing as a profession in today's workplace.

### **Professional Issues in Software Engineering (PISE)**

Collaboration has taken place with students from the University of Limerick in Ireland in the teaching of Professional Issues in Software Engineering (PISE). PISE focuses on the legal, ethical and social aspects of computing. The ethical strand of this module, which aims to develop moral reasoning in the learners, has often proved to be the most difficult for students to grasp and consequently has had a de-motivating effect on some learners.

Computing and Information Systems is an area of practical activity, which in different ways, employs and affects a large number of people in society. It is vital that students are aware of the most pressing professional, legal and ethical issues in the workplace of today.

PISE develops an understanding of the professional and legal constraints within which computing specialists operate, using a 'discussive' environment as the vehicle where the students will be confronted with social and ethical issues of using technology in place of, or supporting, human abilities. The module develops a mature attitude to working as an ethical, environmentally aware computing professional, through critically reviewing germane issues.

For the students at Edge Hill the collaboration needed to assess specific Learning Outcomes, which required the students to be able to: critically discuss future development and deployment of computing and information technologies and assess the possible ethical, legal and professional issues invoked; understand the application of relevant laws governing the IT and Computing Industries; justify their actions and decisions as computer specialists via rational appeal to ethics, law and professional codes of conduct. It also required them to be able to verbally express personal ethical principles. Each group of students were required to produce a report, and give a presentation to their module tutor. The report needed to demonstrate a wide understanding of the issues under discussion, critical reasoning, and analysis and synthesis of material. Each group consisted of 3 students from Edge Hill and 3 from the University of Limerick. For the first cohort all the groups were chosen at random, and as there was a strong recommendation from this cohort to allow any subsequent cohorts to form their own 'home' groups, this was implemented. The final pairings were allocated randomly.

The site was formatted to allow easy access to all relevant information, and included access to course material. There were areas which could only be accessed by all the tutors involved.

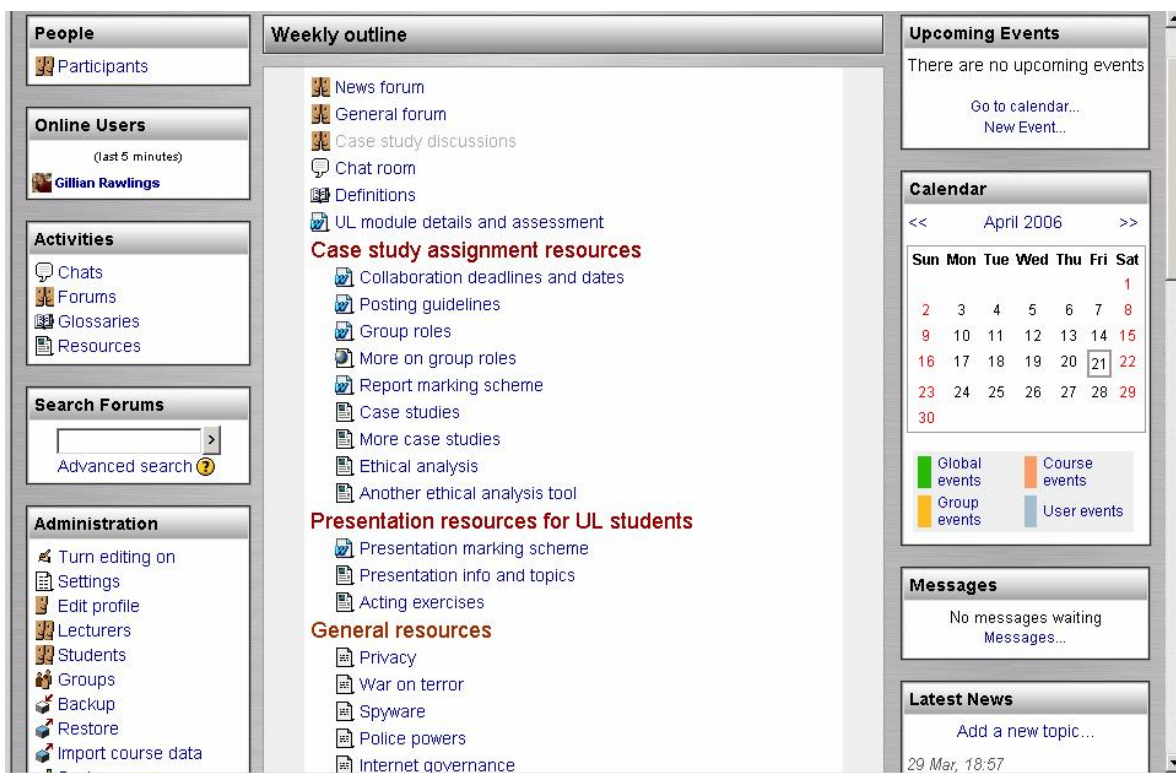


Figure 1: Snapshot of Moodle site used for Collaboration

Contact between the two institutions was initially via a conference on Professional Ethics. The University of Limerick had collaborated before with other institutions, and was keen to repeat the experience again with new partners. The first cohort ran from January to March 2005. This paper looks at the lessons learnt from this initial experience and how that informed the second cohort, that ran from February to March 2006.

There were both formative and summative assessments built into the collaboration. The formative assessment required the students to choose a case study from those listed on the moodle site, and by means of postings, analyse their chosen scenario. There were a series of lectures at both institutions to give a clear understanding of the implications of ethical theories.

Students were given very clear guidelines on posting to the site.<sup>3</sup> The focus was to be on the topics posted, but they were advised to bring in related thoughts and material, other readings, or questions that occurred from the ongoing discussion. Two substantive messages or three or four smaller posts (*about 450 words per person per week for three weeks*) were required for assessment. Posts were assessed according to the criteria below, and needed to reflect an understanding of the ethical theories as they were applied to the case studies. Each posting was graded according to the analysis of cognitive presence.

**Table of Posting Descriptors**

<b>Descriptor</b>	<b>Indicator</b>	<b>Category</b>
Triggering events	Evocative	Recognising the problem
Exploration	Tentative	Sense of puzzlement Divergence within community Divergence within single message Information exchange Suggestion for consideration Brainstorming Leaps to conclusions
Integration	Provisional	Convergence among group members Convergence within single message Connecting ideas – synthesis Creating solutions
Resolution	Committed	Vicarious application to real world solutions Defending solutions

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<sup>3</sup> Based on "Theory and Practice of Online Learning" by Terry Anderson published by Athabasca University in March 2004

<sup>4</sup> Garrison, D. R., Anderson, T., & Archer, W. 2001. Critical thinking and computer conferencing: A model and tool to assess cognitive presence. American Journal of Distance Education 15 (1)

**Collaboration 2006** Jump to...

CSIS » INF3025 » Forums » Case study discussions Update this Forum

Separate groups: Int B Everyone can choose to be subscribed  
Show/edit current subscribers  
Unsubscribe from this forum

Use this forum for your group case study discussions. Your posts can only be seen by your group members and lectures and teaching assistants.

Add a new discussion topic

Discussion	Started by	Group	Replies	Last post
The report		Int B	42	en Wed, 29 Mar 2006, 02:30 PM
Assignment		Int B	90	en PM
Deadline			0	fin PM
Clarify		Int B	20	en PM
Ethical Frameworks		Int B	8	ey PM
Groups		Int B	13	ey PM
Kantianism		Int B	3	ny AM
Act Utilitarianism		Int B	2	pit PM
case study		Int B	4	en PM
Case study selection		Int B	25	ny

**Figure 2: Postings for group B**

The tutors received a copy (as an e-mail) of every posting to the site. Posts were organised into discussion topics, and were added as threads to that topic.

Because this type of communication reduces the range of cues we have for building a mental picture of the people with whom we are interacting and for making judgements about what their words actually are meant to say, all participants are required to add a personal profile and a photograph, and some time is initially given for everyone to socialise on-line.

### Feedback from first cohort

Comments were very positive. Many students commented on the improvement of their own communication and team working skills. All feedback on improving the module was constructive, and focused on the use of the VLE (Moodle). The fact that Easter came at a crucial time in the collaboration meant that the students had to keep in contact (and motivated) when some had planned holidays. This did indeed develop their communication skills!


Students commented that they felt the tutor support was good. This is an important element when collaborating using a VLE. It is very much the case that each and every day all tutors need to be monitoring the postings (and there were in the region of 2000 postings for the first cohort and 4000 for the second) and giving constructive feedback when required. The overwhelming feeling was that the module was very enjoyable as it was 'different' from any other they had studied.

## What changed and why

The next time this module ran (semester 2, 2006) the scheduling of the collaboration was very straightforward, with no holiday period to consider. The students started ‘talking’ to each other earlier, and on a more social basis. Although this was available the first year not many students engaged early enough – in fact some didn’t log on to Moodle until the collaborative element of the coursework kicked in.

Because students from the first cohort used MSN at various stages to chat, instant messaging and a chat room were provided on moodle. These ‘conversations’ could therefore be included as postings (and therefore assessed) if required.

A timetable was provided, which gave clear instructions on how the collaboration was to proceed. The collaboration was further defined by pairing the students within the groups, with one student from each institution working on a particular ethical theory within the group.

	Tasks for students	To be completed by:
1	Register with moodle Add/ update personal profile	24 <sup>th</sup> February
2	Explore moodle <ul style="list-style-type: none"> <li>• start a discussion</li> <li>• reply to a discussion</li> </ul>	3 <sup>rd</sup> March
3	Form into groups of 3 <ul style="list-style-type: none"> <li>• Note: this is on a voluntary basis, but students will be allocated to a group if there is no input</li> </ul>	3 <sup>rd</sup> March
4	Groups to socialise on-line <ul style="list-style-type: none"> <li>• build up a group identity</li> <li>• build up group trust</li> </ul>	3 <sup>rd</sup> March
5	Select case study Inform tutor of selection	3 <sup>rd</sup> March
6	Team building exercise	10 <sup>th</sup> March
7	Start assignment	13 <sup>th</sup> March
7	Hand-in completed assignment	Wednesday 29 <sup>th</sup> March

**Figure 3: Collaboration Timetable for 2006 (20<sup>th</sup> February – 29<sup>th</sup> March)**

The team building exercise in task 6 was used for **formative assessment** of postings on moodle which helped the students adjust the level/contents of postings before the assessment started.

Some of the comments from the student when asked what they had gained from taking this module were:

- Using ICT in this way increases my control of when and where I work
- The importance of teamwork and a good insight into ethical priorities
- Better communication and teamwork skills
- To work through difficult situations with people I’d never met before
- The confidence to work with people through collaboration

- An understanding of the difficulties of 'remote working' and what works and what doesn't work
- Understanding of other peoples views from other culture/backgrounds.
- Confidence to put my views across
- That professional, legal and social aspects of computing are an important factor in IT and IS, and are largely underestimated by the majority of computer users
- Sound understanding of legal aspects in context

## Why Collaborate using a VLE?

The type of collaboration described above can be classed as networked learning.

*"Network learning is learning in which information and communications technology (ICT) is used to promote connections: between one learner and other learners, between learners and tutors; between a learning community and its learning resources. Some of the richest examples of networked learning involve interaction with on-line materials and with other people. But we don't see the use of on-line materials (such as World Wide Web resources) as a sufficient characteristic to define networked learning. There is a danger that such a definition would soon embrace all forms of learning that use ICT".<sup>5</sup>*

The obvious strengths are that it supports relatively high degrees of interaction between the learner and other learners, between the learner and tutor, and with on-line learning resources. In conventional forms of higher education, interaction with peers and tutors usually requires co-presence. Networked learning supports interactivity *and* flexibility over the time and place of learning. Interaction needs to be through well-designed tasks. The learner has time to consider what others have been posting, to reflect, to use other sources, and to prepare their own contributions. All postings are stored as a permanent record. This contrasts with 'real-time' interactions - such as in face-to-face seminars - where there is much less opportunity to consider and prepare one's argument, and much of what was said - good and bad - won't be available to the learner for any subsequent reflection.

One important advantage shown in our collaboration is that those students who have previously shown evidence of under-participation in face-to-face events do not show the same behaviour when using the on-line environment of a VLE. People who are not quick or confident in face-to-face debate can sometimes find themselves 'liberated' by the less intensive demands of communicating in this way.

There are however some limitations. Text-based communications can be seen as a drawback. The use of 'emoticons' (such as a ☺ to represent good or I'm happy with that) are commonplace. Text-based messages may not have the expressive richness of a quick and lively verbal exchange. On the other hand, well-crafted text can be richer than off-the-cuff discussions.

One important feature of Moodle is that postings are 'held' for 20 minutes before they appear on the site. This gives the author time to change any aspect of the posting, or to delete it all together! The decision was taken to allow a considered response to all postings, and to allow others to assimilate their replies. When discussion or group work

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<sup>5</sup> Goodyear. P, Networked Learning in Higher Education Project (JCALT), 2001

extends over days rather than minutes, it can be hard and slow to build a consensus around a decision that needs to be taken, but working to a strict deadline does somewhat concentrate the mind.

It's common to find a mix of kinds of language and contribution in an on-line discussion. Some contributions may be long, deep, analytic and thoughtful. Others may be much more spontaneous and flippant. Clear guidelines on postings are an absolute necessity, as described earlier.

## Summary

Most of the claimed strengths of networked learning have their roots in both the technology and the ways in which the technology is used. The technology alone won't deliver the desired benefit. Ill-considered use of the technology may have results which are the opposite of what you set out to achieve.

The balance of evidence from our cohorts of students who have been involved in this type of collaboration shows that the majority enjoy and approve of the experience. A minority take a more negative view. An explanation for this seems to be that they are not prepared to work outside the normal structure of lectures and seminars, which means they do not participate fully in the experience.

Collaboration can offer benefits for learning in at least two ways. Firstly collaboration can lead to learning. For group members to collaborate necessitates them in articulating and explaining their ideas to each other. Articulation 'externalises' ideas for scrutiny by the group member him/herself, as well as by the other members of the group. Explaining one's ideas and sharing perspectives and viewpoints encourages each group member to examine their own ideas in the light of others' views.

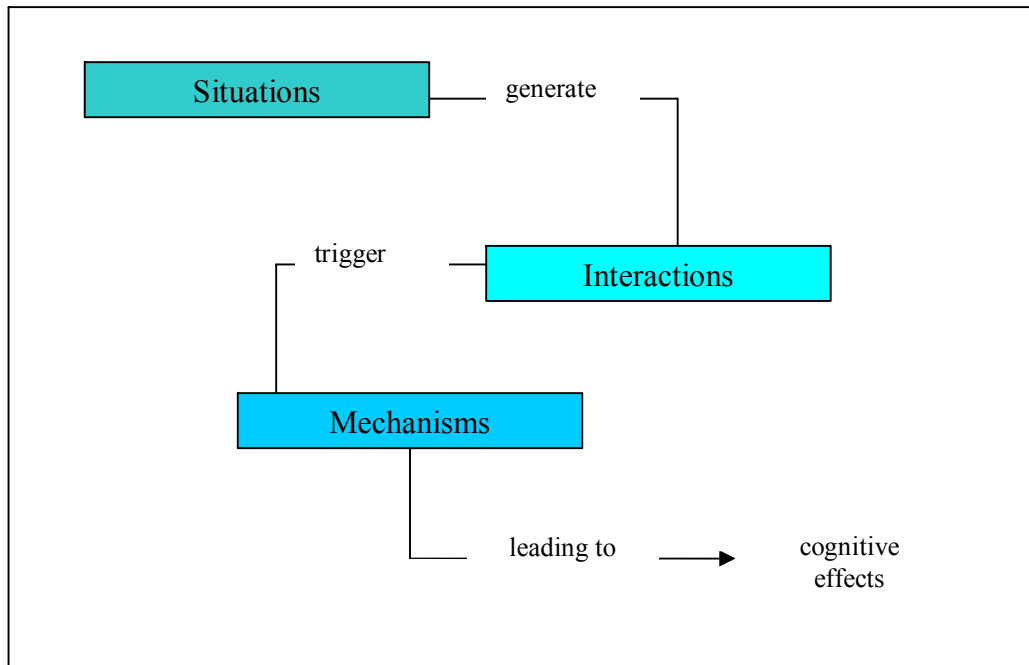
Secondly the experiences of collaboration may help develop important personal transferable skills, including learning how to collaborate. This can also include communication, co-ordination, and self-management skills, which are seen as important for the workplace, where professional work is increasingly project-based, team-based and distributed.

Dillenbourg (1999)<sup>6</sup> offers an excellent account of collaboration in learning processes from a cognitive psychology perspective. He is especially interested in problem-based tasks and looks at both paired and group-based collaborations.

Figure 4 shows how he links learning situations, interactions, cognitive mechanisms and cognitive effects when groups engage in solving problems. This model is useful in that it emphasises the *indirect* connection between a collaborative learning situation and its learning outcomes.

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<sup>6</sup> Dillenbourg, P, **Collaborative Learning: Cognitive and Computational Approaches (Advances in Learning and Instruction)**, Pergamon, 1999



**Figure 4: Situations, interactions, mechanisms and effects**

Some of the cognitive mechanisms, he suggests are:

**Conflict or disagreement** referring to when diverging viewpoints lead to verbal interactions in order to resolve a conflict A slightly 'softer' take is where group members pose alternative propositions.

**(Self-) explanation** as a process of giving an explanation where there can be learning gains for both the person explaining and for the person hearing the explanation.

**Internalisation** which happens when a conversation leads to a progressive integrating of ideas under discussion into one's own reasoning.

**Appropriation** is an interesting notion in that Dillenbourg suggests that interpretations or playing-back of our ideas, by others to ourselves, can actually help us to gain a richer understanding.

**Shared cognitive load** is a principle of economy, in that group-based work can allow members to spontaneously share out a task, to avoid redundancies and to optimise effort matched to the skills or knowledge within the group

## Conclusion

The kinds of collaborative learning situations we can design for on-line activity need to be examined to see how likely they are to generate *interactions* among the group from which cognitive mechanisms may be triggered or enabled.

Learners should not be expected to generate their own effective ways of collaborating. They need clear guidance about how to participate in a group learning situation. Successful collaboration depends on both the technology and the ways in which the technology is used. The technology alone won't deliver the desired benefit. Ill-considered use of the technology may have results which are the opposite of what you set out to achieve.

## References

Anderson. T, *Theory and Practice of Online Learning*, Athabasca University, 2004

Dillenbourg. P, *Collaborative Learning: Cognitive and Computational Approaches (Advances in Learning and Instruction)*, Pergamon, 1999

Garrison, D. R., Anderson, T., & Archer, W. 2001. *Critical thinking and computer conferencing: A model and tool to assess cognitive presence*, American Journal of Distance Education 15 (1)

Goodyear. P, *Networked Learning in Higher Education Project (JCAL T)*, 2001

## Web Sites

<http://moodle.org>

<http://docs.moodle.org/en/Philosophy>