Innovative Ways to Teach Innovation: Introducing Enquiry-Based Learning to Manchester Business School Undergraduate Teaching

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Abstract

This case study describes the development and evaluates the use of Enquiry-Based Learning (EBL) on undergraduate (UG) teaching in Manchester Business School (MBS). Funded by the Centre for Excellence in Enquiry-Based Learning at the University of Manchester, an EBL coursework and supporting seminar series was developed for 'Organisations, Management and Technology', a second year UG module in MBS. After outlining the rationale behind introducing an EBL process, the paper describes the development of an EBL scenario related to the aims and objectives of the module; a series of supervised and unsupervised seminars; an assessment criteria and conflict resolution procedure; and supporting framework document. The second part of the paper evaluates the EBL process, presenting evidence from student feedback. Evidence suggests that the introduction of the EBL method was a success, with students benefiting from a more applied, dynamic learning experience that supported them being creative, adaptive and organised.

Background and Rationale

Following changes to the credit structure of undergraduate courses in MBS in 2006, assessment on the second year undergraduate 'Organisations, Management and

[1] Acknowledgements must go to Evita Paraskevopolou who was the seminar leader on OMT for three years and helped me design this EBL method. Also, I acknowledge the funding and support of the Centre for Excellence in Enquiry-Based Learning.

Technology' (OMT) module changed from 50% compulsory coursework to 30% optional coursework. The following year, 2007, less than one-fifth of the students undertook the essay. This was deemed to undermine the learning outcomes of the course, particularly with respect to the students' application of knowledge. As part of a broader change to OMT, which saw it increase from one semester to two semesters, a new compulsory coursework component – consistent with EBL – was designed to require students to apply their knowledge gained from the course. It was very important that the coursework should be informed by (and require the application of) innovation studies theories discussed in the first semester and the wide implications of technology diffusion discussed in the second semester of the module. It was intended that the EBL coursework would put students in a scenario (with guiding boundaries) and require them to formulate their own research topic, which was based on the principle that knowledge acquired through individual enquiry is better retained. Guidance and support were given to direct students toward the resources they needed to research the topic and acquire knowledge. The EBL coursework was designed to be a derivative of the so-called 'Manchester Method': an interactive, experiential and dynamic way for students to learn, thereby preparing them better for leadership positions in which creative and adaptive behaviour is required[2]. The EBL coursework was designed to be student centred, with an emphasis on group work, time management and organisation. In this sense, the EBL coursework contributed to the development of students' intellectual and transferable skills, e.g. self-organisation, team work, delegation, presentation and reflection skills. These were formalised with new learning outcomes (see Figure 1).

[2] The 'Manchester Method' is how Manchester Business School (MBS) described its method of MBA teaching: Harvard Business School used "case-studies" (stories of real companies that students analysed to suggest appropriate strategies for success); MBS used real companies (as well as case studies) - and it still does, notably in the 'International Business Project' in which students do a project for a real company (and for which they are paid) and learn about company strategies 'in real time'. Any programme in MBS that gets a student to study a real company/organisation, with that company's participation, is referred to as the Manchester Method.

1. Students should be able to apply their knowledge of innovation studies to investigate a specific question/issue;
2. Students should be able to use electronic and other sources to gather quantitative and qualitative data;
3. Students should be able to demonstrate effectively skills of self-organisation, team working, delegation and presentation;
4. Students should be able to reflect on their learning and approach to completing a task.

Figure 1 New learning outcomes associated directly with the application of the EBL method.

Given the time commitment to develop an EBL coursework and supporting seminar series, the Centre for Excellence in Enquiry-Based Learning (CEEBL) funded a PhD student – already the Graduate Teaching Assistant on OMT – to assist the module co-ordinator in developing the EBL coursework and supporting seminar series. The task was to:

1. Identify a broad question with boundaries and multiple aspects suitable for constructing an assessed final-team essay (with individually assessed components);

2. Develop a framework document that provides guidance on the essay's structure and content;

3. Develop assessment criteria for the essay and presentation;

4. Plan appropriate taught and non-taught elements to support the delivery of an EBL method in a series of supervised and unsupervised seminars;

5. Develop a 'reflective' exercise to help students maximise their learning experience.

This paper describes the development of the EBL coursework and supporting seminar series and evaluates its first run through in 2008[3].

[3] It was originally intended that the coursework should run over two semesters. Contingencies were made for international students (who are present for the first semester only) to contribute to the project. It was planned that international students would be allocated randomly (one per group) amongst the groups and complete a separate (but related) question addressing the past and future technologies affecting the industry in which the firm operates. Each international student's essay would then be given back to the group (without revealing the mark or feedback), who would have the opportunity to use it (if they consider it suitable) to inform their report. Later the decision was taken to run the coursework across one semester only, which helped the pace of the project.

Approach

Deciding on the scenario of the assessed group work was a process that went through considerable iteration and development. We were keen that the students would discover for themselves the implications of the development of a new technology and the different types of stakeholders involved. It was decided that the students should be put (randomly) into teams of four or five persons, and allocated (randomly) a firm upon which to focus. The anchor to a particular firm was deliberate because it was felt that the students could better familiarise themselves with firms rather than complicated technologies. In line with the learning aims and objectives of the course, the scenario also had to have a managerial perspective. Given the research-led nature of OMT teaching, the firms were all drawn from one of four industries (food, chemicals, automobile or construction) in which the course co-ordinator had research experience. Groups were put into the scenario of being part of the firm's management team and asked to compile an advisory report for the Board of Directors. With respect to the firm's capabilities and operating environment (i.e. internal/external constraints/opportunities, drivers for change), the group report considered the implications (i.e. economic, social, environmental) of the firm investing in a specific technology (identified and decided by the students). The final question is shown in Figure 2:

> You are a technology management team. You are advising the Board of Directors on the technology strategy of the firm. You have been asked to produce a report on the following issues:
>
> - the drivers for change in the industry;
> - the role of technology in responding to change;
> - the opportunities and challenges of adopting/developing a specific technology.
>
> The 3,000 word report should draw recommendations (supported by an appropriate theoretical framework) for the firm about whether to invest in a specific technology or not.

Figure 2 The question.

As originally devised, it was intended that each group would present a concise synthesis of their report. The presentation of each group would take the form of a five-minute elevator pitch followed by five minutes of questions to all the members of each group (in order to ensure everybody's participation). External industry experts would attend the final presentations of the groups. In preparation, an assessment rubric was designed (see Appendix C) to inform both students and external assessors (i.e. to avoid subjectivity and favouritism). In the end, this approach was abandoned because there were concerns of over-assessing the students. The presentation idea was used at post-graduate level and the assessment rubric informed a separate undergraduate first semester coursework component.

Students were supported by a series of supervised and unsupervised seminars. In the first supervised seminar after teams and firms were determined, a timetable (see Appendix A) and further details of the seminars were presented to the students, along with information about how the report would be assessed (including penalties for plagiarism and late submission) and the supporting framework document about the report's structure and content (all this information was made available on the module's webCT). Teams were advised to select a chairperson and a minute-taker (or diary recorder) to record events (e.g. note individual responsibilities) and to start delegating tasks. The module co-ordinator led all supervised seminars and was also available during lectures and office hours; it was stressed in this first seminar that help was not 'on-tap' and advice could only be sought during specific contact hours.

Supervised and Unsupervised Seminars

The seminars were intended to help students organise both their time and group dynamic. The aim of the supervised seminars (one hour every two weeks) was to provide students with research skills (e.g. accessing and evaluating critically different sources of information: from the firm, the government and other stakeholders, as well as analysing both quantitative and qualitative data) and encourage them to 'eat an elephant with a spoon' (i.e. break the task down into 'bite-size' chunks). The five supervised seminars included structured presentations, class interaction and group work:

- Structured presentations were made by the seminar leader on boundaries of the project, gathering background information, accessing relevant academic journals, report referencing and structuring and reflecting. All structured presentations concluded with the assignment of the next deliverable (see Appendix A for more details).

- Students were expected to present evidence of their efforts in every supervised seminar, which began with a short (2-5 minute) presentation update from each team on deliverables assigned in the previous seminar. Team presentations were made in front of the whole group in order to share knowledge, information sources and progress.

- The last part of the supervised seminars provided an opportunity for individual or team tutorials with the module co-ordinator regarding any difficulties or concerns

and feedback on the team's progress; they also offered the student teams the opportunity to divide tasks for the next deliverable.

The aim of the unsupervised seminars was to maintain momentum by giving the teams, including students from different departments, a timetabled opportunity to meet, discuss progress, organise tasks and work towards deliverables or the final report.

Assessment

Assessment of the group report (weighted 40% of the module's assessment) was based on the argument and structure of the report; the strength of the introduction and conclusion; use of sources and referencing; and presentation and language. The report would receive a 'group' mark but be adjusted for individuals according to their contribution: teams were given the responsibility to decide what constituted 'contribution'. If every team member 'contributed' equally, they signed a sheet attached to the report and all members of the team received the group mark. However, if team members did not contribute equally, and could not resolve the issue between themselves, a conflict resolution mechanism involving the course co-ordinator came into place. The seminar leaders' observations were noted; attendance records at seminars were checked; written reflective statements from individual team members assessing their own and others' 'contribution' were submitted; and interviews with the course co-ordinator were conducted. This process was explained to students in the first supervised seminar and re-iterated throughout the seminar series.

Supporting Framework Document

Following an insightful workshop given by George Allan in CEEBL about 'learning journals' (Allan 2006), a jigsaw of questions was designed to support the students' learning and creativity (see Appendix B). We were careful to explain that this 'jigsaw' (not the correct analogy, as it suggests a unique solution) gave students an idea of the kind of questions they may wish to consider in their report and that we encouraged efforts to go beyond this framework.

Evaluation

The EBL coursework and supporting seminar series were successful in a number of ways. The 'red flag' warning about individual contribution, combined with the structured support of the seminars and continuous feedback, averted any problems with team members not contributing fully[4]. By and large, student teams performed well on the task: reports averaged 65% but ranged between 55% and 85%. Feedback on the coursework was obtained in three ways: through informal discussions with the module co-ordinator in the final supervised seminar; an anonymous course-specific evaluation form that included a question addressing directly the coursework and supporting seminar series; and an anonymous university-general evaluation form.

Discussions with students and feedback from the course-specific evaluation revealed that they thought the coursework had been a '…*good learning project, a very useful, knowledge enhancing, valuable experience*…' that '…*drew together theory and practice in a real life situation*…', helping the students "*to think of innovation in a more practical sense*'. The fact that the report required application of theories discussed in the first semester, in light of the broad assessment framework for technologies discussed in the second semester, was appreciated: '…*[it] puts the entire course information into context and shows applicability*…', as one student put it. In addition, the EBL process

[4] A derivative of the EBL coursework was undertaken on another 2nd-year undergraduate course, 'Environmental Management for Sustainable Development'. The question was different of course, but the underlying scenario-based method was the same; groups were made up of four or five individuals, randomly distributed, etc. The main difference was that all seminars were supervised, and although the seminar leader was on hand to offer advice on an ad hoc, report specific basis, there was not the structured presentation of research skills, assigning tasks, making presentations, etc. The less structured seminar content may have contributed to problems in the teams with respect to their individual contributions. On OMT, no teams had any problems. On EMSD, three teams had problems. In these instances, it was about individuals – sometimes two – not 'pulling their weight'. In these instances, we reverted to the conflict resolution strategy outlined above where the module co-ordinator asked all team members to submit a written, reflective statement, rating their contribution vis-à-vis others (they were all asked to rate themselves and each other out of 100 in terms of their contribution), and, importantly, justifying their rating. The module co-ordinator also spoke to the some of the main protagonists (i.e. those who felt most strongly or those who were the 'accused') and asked for an independent view of the seminar leader who had witnessed the group in action. The module co-ordinator made a final decision about each team member's contribution and informed them separately with justification. All students accepted the decision.

It was interesting to observe how students defined contribution – this was an 'internal' team matter and revealed only in the three instances of group breakdown. Some teams quantified factors (in equal proportion) such as communication (e.g. e-mail, phone), general work effort, group meeting participation and quality of work produced. Others reflected qualitatively on each-others' commitment (to the team and team work), reliability (attendance at meetings etc), work ethic (prioritising, sacrificing), co-ordination and organisational ability (arranging meetings and ensuring progress of the report) and quality control (monitoring the quality of activities and contributions).

helped students develop their transferable skills: '*…group work, management and leadership skills*…' were picked out by one student.

The structured seminar series benefited the students in terms of organising themselves *('…[the structured seminars] give a lot more incentive for you to attend, i.e. you feel you have a responsibility not to let your team down…'),* their work *('…they helped piecemeal work'…)* and their thoughts (e.g. '*recapping innovation studies theories was helpful*'). Timetabled and unsupervised seminars gave them a dedicated time to meet as a group *('…very useful in structuring the assignment and made it easy to arrange group meetings…')*.

There was some negative feedback. Some of the groups found it difficult to work effectively together. A couple of students felt the group sizes were '*too big*', making communication difficult, while others found it *stressful* to work in groups. In addition, the venue for the supervised seminars was inconvenient (supervised seminars were delivered in CEEBL, which is a 15-minute walk from MBS).

Overall, feedback suggested that the students learnt a lot from the exercise and also that they enjoyed the experience and thought it useful for their future careers. In the 2008 course-specific evaluation, OMT scored 1 (on a scale of 2 to -2) compared to 0.7 in 2007. In the 2008 university-general evaluation, OMT out-performed the MBS average on all 15 criteria, averaging 1.41 (on a scale of 2 to -2) compared to an MBS average of 0.92 and an OMT score of 1.13 in 2007. In particular, it was felt that the EBL process contributed to high scores in the following categories shown in Table 1.

There were wider benefits too: development of the module co-ordinators' teaching capabilities (reflected in the 'excellent teaching' scores above), knowledge transfer to others in MBS about employing an EBL method (diffused through formal seminars and informal discussions with other members of faculty) and the rolling out of hybrids of the EBL method to the module co-ordinators for other UG and PG courses (these benefited also in terms of high evaluation scores).

Statement	OMT 2008	OMT 2007	MBS 2008
The teaching I received was excellent:	1.48	1.39	1.03
The skills I developed will be valuable:	1.21	0.86	0.97
The feedback I received on my work was helpful:	1.34	0.75	0.37
The teaching staff and supports were readily approachable:	1.73	1.32	1.01
I have increased my knowledge of the subject matter:	1.69	1.29	1.22
The teaching staff responded to questions about the subject matter:	1.69	1.36	1.03
The seminars enhanced my understanding of the subject:	1.18	-	0.77
I would recommend this course to other students:	1.15	0.9	0.92
Mean score	**1.41**	**1.13**	**0.92**

Table 1 Evaluating OMT 2008 vis-à-vis MBS UG average 2008 and OMT 2007. Note: Questionnaire completed by 71% of students undertaking the OMT module. Figures for OMT and MBS UG are mean scores. Students were asked to agree (2), mostly agree (1), neither agree nor disagree (0), mostly disagree (-1) or disagree (-2).

Further Development

The framework developed for the EBL process lends itself to incremental change: different firms in different industries can be used next year for instance. Having been through the process once, more support for students will be available in 2009. In response to the negative feedback, a couple of specific changes will be made with respect to the venue and group work. In 2008/9, the seminar series will still be launched in CEEBL but the other four supervised seminars will be located in MBS. Moreover, in response to the challenges of group work, the seminars are being extended from 60 minutes to 90 minutes to allow more supervised group-interaction time and groups will be capped at five persons (one team had six members in 2008 – individuals in this team could have been the source of the negative feedback). Although there were no problems with individual team member's contributions, problems did occur on another UG course led by the module co-ordinator. The lessons learnt from that experience can be applied to OMT, particularly in terms of helping the students state (at the beginning of the process) what they understand by 'contribution' (see footnote 4). Diffusion to other courses led by the module co-ordinator of the more structured elements needs more time/resources to develop. At the moment, the modules are benefiting from a watered-down, less-structured approach.

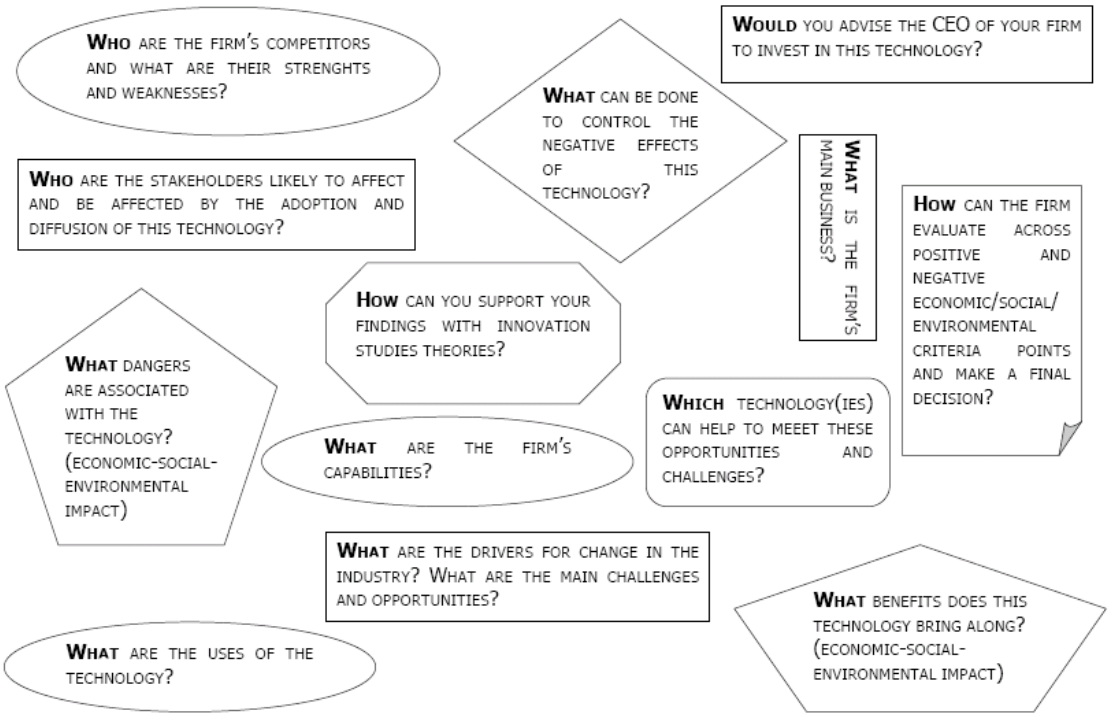
References

Allan, G., 2006. Engaging Our Students by Linking Enquiry-Based Learning, Learning Journals and Reflective Thinking. Business, Management, Accountancy and Finance (BMAF) Subject Centre Workshop, 8 November 2006, CEEBL, University of Manchester. Available at:
http: www.campus.manchester.ac.uk/ceebl/events/archive/engagingstudents

Appendix 1: Seminar Timetable

Seminar	**Topic**
Supervised Seminar 1: Introduction and boundaries	1. Introduction to the group work, including nature of the coursework and role of Paul Dewick (PD). 2. Group allocations: chair persons and minute takers. 3. PD to explain the topic (drivers for change, stakeholders, technologies, challenges and opportunities). 4. PD to explain structure of the report (provide students with & explain the report support document). 5. Assign deliverable for next seminar (i.e. Preliminary research into the firm). 6. Breakout and group/individual tutorials (Students to organise themselves: assign chair, minute taker, tasks among team members).
Unsupervised Seminar 1	Students work together to find information about the firm and prepare small presentation on about the firm.
Supervised Seminar 2: Background information	1. Each team to give 2 minute brief on preliminary data search 2. PD to give introduction to firm information (e.g. FAME), industry reports (e.g. MINTEL) and relevant databases (e.g. Business News/Govn News - FACTIVA) for students to find the competitors of their firm, the relevant stakeholders and the drivers for change. 3. Assign deliverable for next seminar (i.e. preliminary research into the industry/technology). 4. Breakout and group/individual tutorials.
Unsupervised Seminar 2	Students work together on data search and prepare short (2 minute) presentation.
Supervised Seminar 3: Literature review and methods	1. Students 2-min presentations about each group's firm, competitors, stakeholders, drivers, etc. 2. Literature Review, Finding Journals, Books, Citations. 3. Discussion of method. 4. Assign deliverable for next seminar: what innovation theories are pertinent? And what case study examples are relevant? 5. Breakout and group/individual tutorials.
Unsupervised Seminar 3	Students work together to find relevant literature and consider pertinent theories from the first semester; prepare short (2-minute presentation).
Supervised Seminar 4: Accurate referencing	1. Students 2-min presentations on literature review. 2. PD provides helpful material for building up the report, show them alternative referencing types. 3. Breakout and group/individual tutorials.
Unsupervised Seminar 4	Students undertake further work on group report; bringing together contributions, drawing conclusions.
Supervised Seminar 5: Reflective exercise	1. Seminar leader introduces reflective exercise. 2. Breakout and group/individual tutorials. 3. Final discussions.

Appendix 2: Jigsaw



Appendix 3: Assessment

Rubric For Evaluation of Presentation				
Criteria	**4**	**3**	**2**	**1**
Completeness/ Content (30%)	Clear understanding and effective use of concepts; Engagement with subject in appropriate depth; Original thoughts and inputs; Good use of evidence.	Most but not all of the key concepts are represented with sufficient detail; Sufficient depth if analysis; Sufficient originality; Sufficient evidence presented.	Most but not all of the key concepts are represented but not all with sufficient detail; Medium depth of analysis; Some evidence of originality; More evidence would be required.	Most of the key concepts are missing and those that are presented don't have sufficient detail; Descriptive analysis; Absence of originality; Lack of important evidence.
Connections/ Structure (25%)	The presentation indicated the connections between the issues discussed in the report; Strong conclusions.	Most but not all the connections are depicted; General conclusions.	Few of these connections are Depicted; Weak speculations rather than conclusions.	No connections are depicted and no conclusions are made.
Management of Discussion/ Explanation (30%)	All members of the team were able to answer questions directed at individual level.	Each member was able to answer to individual questions but sometimes needed help from teammates.	At least 1 person was unable to answer questions regarding the project.	2 or more people were unable to answer questions regarding the project.
Presentation Style/ Creativity (15%)	The visual images used for the presentation were creative and appropriate to the concepts being communicated; Efficient use of time; Speaking to the class not reading aloud.	The visual images used for the presentation contribute to the communication of the concepts but are not particularly creative; Went a bit over 5 mins; More speaking and less reading.	The visual images used for the presentation are creative but do not contribute to the communication of the concepts; Exceeded 5 mins; More reading and less speaking.	The visual images selected are neither creative nor appropriate to the concepts being communicated; Did not complete the presentation on time; Reading aloud.