Centre for Excellence in Enquiry-Based Learning
Project Case Study

Assessment of Enterprise through Enquiry-Based Learning

Tim Jones
Manchester Science Enterprise Centre

Abstract

The subject of Enterprise is about explaining how ideas are used and applied commercially usually using a business organisation. At the University of Manchester Enterprise is taught to a wide range of students drawn from many subject areas. The 10-credit unit ET3001 is for final-year students who have never previously studied Enterprise. 40% of the unit is assessed by assignment and 60% by examination. It is relatively easy to set a narrow assignment task which tends to drive the students to supply stock answers to familiar problems. However, this approach tests mainly the surface of the subject and is a poor measure of deep understanding.

This project set out to design an Enquiry-Based assignment which allowed the students considerable freedom to demonstrate their depth of learning, yet at the same time had explicit assessment guidelines to ensure consistency of marking.

The assignment was to investigate and suggest improvements for a product (Appendix 1). The selection of the product was a free choice for each student. It was important that students did not set off and simply write an essay on 'everything I can find out about the... iPod'. In a business context there would be a requirement to establish the current state of the art, make an assessment and then recommend a way forward.

Background

Enterprise is taught to a wide range of students drawn from many subject areas. The 10-credit unit ET3001 is for final-year students who have never previously studied Enterprise. 40% of the unit is assessed by assignment and 60% by examination. Students typically come from Physics, Chemistry, Civil Engineering, Mechanical Engineering, Computing, Maths and Textiles. A total of 117 students were taught in two groups in Semester 1, 2005-06.

Rationale

The assignment needs to test the deeper learning of the Enterprise material, which is better assessed when applied to a real life situation, rather than to a dry theoretical situation. For example: 'How is the intellectual property of Dyson vacuum cleaners protected?' Rather than 'Explain the importance of Trade Mark, Patent and Registered Design to a business using suitable examples to illustrate your answer'.

Students were to be given a free choice of product to study so that they could pick something of interest to them/ their subject area.

What was not required was a free choice essay on anything they liked. In a business environment there would always be a requirement to achieve a particular end with the report. The content of the report arising from this unit would need to cover areas of the syllabus, such as understanding markets and the protection of intellectual property.

Approach

What do I Want at the End?

The assessment was designed starting with the end result in mind. I wanted to read a business report which analysed the current position of an existing product in terms of technology and market. The report would conclude with recommendations for the future model of the product, based on the analysis of the data in the first part of the report.

Appendix

I wanted to know that students had actually performed some investigative research, so I decided to ask for an appendix made up of each piece of information used to compile their report. I would ask for a highlighter pen mark over the relevant figures, text etc.

Guide Structure

If I left the contents of the report to the whim of the student I would be faced with a problem when marking different scripts to a consistent standard. Without guidelines, one student might have spent 80% of the report on, say, the market and another might have spent the same percentage on analysis of technologies in the sector. Both approaches would lead to a very unbalanced report, although the students would have excelled in one area. To encourage balanced report construction, I would issue a set of sub-headings and marks to be allocated per heading. This structuring would also help consistency of marking.

The assignment took over a day to write, edit, check, re-draft etc. I consulted a colleague to check that the instructions were really as clear as I thought they were. The assignment with standard guidelines ran to 4 sides of A4.

No Negotiation

I have discovered that if a point is not laid out clearly, then it becomes a potential issue for students to exploit as negotiation tool, i.e. submission deadlines, penalties, etc. Students with higher powers of negotiation should not be allowed to adjust the boundaries for the assessment process in their favour.

Early Issue of the Assignment

The assignment was issued to all students in their first lecture. This was clearly a shock to some. The purpose of giving them early sight of the assignment was to give them time to think about the question and come back for clarification if required.

Read the Question!

Oddly, many students took the question sheet and immediately saw the primary task as 'having to invent a new product'. I had to ask students to read the question very carefully and not jump to conclusions. My first lesson was that students often don't read the question carefully. I went through the question with the students during a lecture session and still some thought that they could negotiate and adapt the question to a different format. Typically they wanted to write about a whole company, not a single product, or they wanted to do the project on a topic which they had done previously for another subject assignment. The value of having a rigorously checked, written assignment question enabled me to keep the assignment exactly as intended. The students wishing to change the assignment to suit their personal requirements had to come back into line.

Stressing Linkages

During the following weeks I continued to deliver the lecture programme, at various points making explicit reference to the linkage between the topic being taught and the assignment. I find that students often regard a topic such as project management as separate from every other thing they study. I explained that time-planning techniques used in project management could be put to use to help plan the execution of the assignment. They don't form part of the assessment itself, but good time planning would make the whole process a lot easier!

Thinking of a Subject

From the analysis of student project diaries (which were a mark-carrying component of the assignment) it is clear that apart from trying to think of a suitable subject to study, very little work was undertaken by students in the first 3-4 weeks of the semester. After this time I started to find that half a dozen students would ask me at the end of a lecture if a particular product was suitable. If an unsuitable topic was suggested I explained why it would not be appropriate. Examples were very simple products such as stockings and shampoo, which would have been very difficult to write about in enough

depth, and service-based businesses such as fake tan studios which had no 'product' to analyse.

E-mails

From week 5 onwards I started to receive more and more e-mails from students. Most were simply checking that I thought that their product choice was suitable for study. I began to dread reading so many reports on the iPod and GHD hair straightening irons! These enquiries in the main simply required me to reassure students that their choice was fine.

Gradually the e-mails started to include questions on how to find information on particular parts of the report. In particular, students struggled to find patent information even though the web site was given to them as a reference in lecture notes. A search which involves a process not using Google appears to defeat students easily.

Towards the last couple of weeks the volume of e-mails increased, and students were starting to ask for comments on draft reports. Limited feedback was given to every e-mail received. This process of answering all e-mails within twenty-four hours was time-consuming but did receive considerable praise in end-of-unit questionnaires. Students clearly valued the fact that there was someone to turn to if they felt unsure about the correct approach.

A discussion board would have cut down on some of the repetition I found in answering very similar questions. However, I think that students prefer not to share their worries and inadequacies with others in an open forum. The quieter students in particular might have been inhibited from asking for help and advice.

Assessment

This assignment was intended to drive the learning process, encouraging the students to put into practice and apply the tools and techniques taught in the lectures. The assessment and the learning process were deliberately closely linked so that each would drive the other. The assignment work needed to be attributable to individuals, so work was to be submitted on an

individual basis. The assessment needed to be straightforward to mark and required a robust marking scheme. The marking scheme was laid out in the original question.

Evaluation

Diary

As part of the assignment, students were required to compile a diary of their work on the report. This proved to be quite a revealing document. Students were remarkably honest. Tales were related about late start, weeks away at home during reading week, indecision about which product to select and problems encountered in finding relevant information.

Some students stated how much they had enjoyed the work and quite a few stated that the work had taken them some considerable time to undertake.

The diary provides a valuable feedback mechanism of a qualitative nature. The comments contained in the diary can complement unit questionnaires, which are often evaluated using purely numerical-satisfaction scores.

Report

The reports were handed in and all except two were on time. The requirement to submit appendices made many reports very bulky. The pile of 117 reports measured 800mm high, a daunting task for the marker!

Reports were generally of a high standard with some students achieving 90+%. These reports would have been acceptable on a company boardroom table.

Marking was straightforward because students had laid out their reports in the order suggested by the question, so the marker did not have to hunt through the document for the relevant section. Appendices were reviewed first to get a good feel for the type, range and quality of material the student had used. (The student using pages torn from 'Nuts' magazine rather than Mintel market research was clearly likely to be a lighter weight contribution!)

Individual marking sheets were used to provide each student with detailed feedback on their report (Appendix 2). In addition, a general feedback sheet was given to each student with some common messages appropriate to many students (Appendix 3).

It was impossible to mark more than ten reports before taking a break. This highlights the need for a consistent approach to mark allocation. The marking scheme worked well and mark allocation remained consistent.

Common Problems

A common problem was that students did not give their work a main heading. For example, a report on a Nokia phone might reasonably have been expected to carry a title 'product report on Nokia 4444 mobile phone'.

Some students read intellectual property as 'only patents' and consequently lost marks in this section. Some students confused the *features* of a product with the *benefits* the user gets from the product.

Some were very poor at using the information which they had found, to justify and build up a systematic case for their particular product application. They preferred instead to quote a source of information and leave the reader to work out the connection.

Mintel market data was used extensively, but was usually fully acknowledged with appropriate references. This meant that cut and paste plagiarism, a potential problem, did not occur.

Additional Feedback

Some students e-mailed to receive additional feedback when they discovered they had scored a low mark (say less than 50%). Individual face-to-face appointments were made and the marking feedback form was used to drive the meeting, referring to the original report document for examples. The robust mark allocation process made it easy to justify the marks which had been awarded for each section. This approach neatly

nipped in the bud any attempt by the student to try to negotiate or 'talk up' the report mark.

Further Development

The assessment produced some excellent, high-quality work. The students worked hard and most seem to have got something positive out of the experience. I regard it as a very successful assessment.

It would be useful to reduce the sheer physical bulk of the reports. More selective appendix building might be the best approach here. A method of marking more quickly would be a boon, but is likely to be elusive. A discussion board might reduce some of the e-mail traffic to the personal e-mail box. However, it might not help shy students.

A report based on an executive summary might be worthwhile. This would force students to condense and edit down to an efficient business format.

Further analysis of the personal diaries is likely to reveal further areas for refinement.

Appendix 1

Manchester Science Enterprise Centre

Technology Enterprise with Tools and Techniques

ET3001 (MSEC UG04)

Semester 1 Assignment

Set: September 2005

Deadline: Week 9 – Thursday 24 November 2005

Assignment Task

Your assignment task is to undertake a detailed analysis of an existing product and then propose a specification for a new improved product, to be launched in 2007.

Select a single, real product, on sale in the UK, which is of interest to you. Chose an up to date product which own or have used. You are to assume that you work for the company in the UK which is responsible for planning the next generation of this product.

You are advised to select a product which you can find information on by using a variety of different sources. This will enable you to create a balanced view in the report.

Your report should follow the structure indicated below:

Introduction 5%

Briefly introduce the reader to 'your' product, the manufacturer and the market the product serves in the UK.

The UK market 20%

Use secondary market information, gathered from reliable sources to create your own summary of the current UK market for the product which you have chosen to analyse. Identify the main rival products and manufacturers which also serve the same market. Give numerical indications of market size/value and segmentation by quoting or extrapolating from your secondary research data.

User benefits 10%

Analyse the benefits which the customer currently derives from using/owning the product. Summarise these benefits in a clear and logical format.

Technological developments 15%

Identify technological trends which might influence the next generation product and produce a brief analysis of the technologies which will be important to the new product.

Intellectual Property Protection 20%

Search for all forms of intellectual property relating to the product. Produce a summary of all forms of protection currently in place for the product in the UK.

Performance Specification 20%

Use the analysis of trends which are influencing the market, the technology and the users, give a brief reasoned account of what the future product might be expected to do.

Complete this section with a performance specification table ('must do' list) for the new product. The performance specification table should state what the new product should do and a justification of why each of your chosen characteristics is important to include. A design is not required. Give the most important 10 points, avoiding points which are very similar to each other, obvious features already common in any product of the type and trivial issues.

Personal Progress Diary 10%

During the course of this assignment you will be putting into practice some of the topics delivered in the lecture programme. Make a single, weekly diary note of things which go to plan, those that don't and how you overcame any problems. Note what you would do differently in the future. This diary should be placed in the appendix and be about 500 words in length.

Appendix

For each statement made in the main body of your report, there should be a corresponding reference to the original source of the information. This should be in the form of a photocopy or print of the relevant original page with the information you have used marked with a highlighter pen.

Length

Assignment length should be 3500 – 4000 words excluding the progress diary (500 words) and appendix.

Undergraduate Assignment Standard Instructions

This 10 credit unit Technology Enterprise with Tools and Techniques ET3001 is assessed by both assignment and examination. This assignment contributes 40% to the final mark of the unit.

Assignments are designed to allow you to present a piece of work which shows your depth of understanding of the enterprise topics being assessed. A generous time period has been allocated to allow you to undertake the research and composition of this piece of work. The completed work must be handed in to the MSEC office, Floor 2 Fairbairn Building, Sackville Street before the deadline of 3pm on (Thursday 24 November 2005).

Work handed in after the deadline will be placed in the Red Box and a penalty will be applied. The penalty is 10% reduction per week or part week late. If the penalty given would take the mark below 40% then the minimum mark awarded will be 40%. The absolute submission deadline, where zero marks are recorded is the earlier of 5 weeks after the prescribed submission date or one week after the relevant examination.

Extensions to the hand in deadline may be requested in exceptional circumstances only (such as lengthy illness or bereavement). Any event which could reasonably have been predicted to occur within the assignment period is not legitimate ground for an extension (days off, working, minor sickness and event attendance) Your request must be in writing (e-mail) to the unit lecturer copied to a.taylor@msec.ac.uk giving the reason why an extension is required. The request must be submitted as soon as you identify the need for an extension. Requests received after the hand in deadline will not be considered.

Please note that part of the skill in undertaking an assignment is the planning of your personal time. It is strongly recommended that you produce a work plan when the assignment is first issued to you. Make a note of commitments such as religious observance, weekends away, part time jobs etc and plan your work around these dates.

Keep a constant back up of your work in case your PC should break down or be stolen. Print out your final version at least a day before the deadline to allow time for minor corrections and printer failures.

Plagiarism

Your assignment demonstrates your understanding of the subject. It is important that the assignment which you hand in is written in your own words. If you do use even a few words from another source, then you must reference exactly where the quotation has come from. Guidance notes on referencing to the Harvard system are available from MSEC.

Information must never be 'cut and pasted' into the body text of your assignment unless it is clearly and fully attributed to the original source.

Unless otherwise indicated, you are expected to work individually on your assignment. Any assignments which appear to have similarities with each other will lead to disciplinary action under the University rules. Allowing your own work to be copied is treated as severely as the act of copying from someone else's work.

You will be asked to sign a form when handing in your work stating that it is all your own material. Your attention is drawn to the University policy on plagiarism:

http://www.campus.manchester.ac.uk/ssc/examinations/exampoliciesinformation/plagiarism/

Plagiarism detection software is used and MSEC may ask you to supply an electronic version of your assignment for routine checking.

Feedback

All assignments which are handed in before the deadline will be marked within a target time of approximately two weeks from the hand in date. Marks and individual comments about the work will be issued to each student. General feedback points may be given to the whole class group as a hand out or session within a lecture/ tutorial. The formative feedback comments are intended to help you to improve your approach to future work tasks.

It is important to note that the mark awarded is not negotiable. The mark you are given has been through a first and second marking process, but is subject to further checking and moderation by the external examiner and exam board. All MSEC staff are willing to meet with students to give brief personal feedback comments about the assignment.

If you believe that there has been a numerical mistake in the marking of your work you can e-mail A Taylor to request that the assignment be re-checked stating where you believe the mistake has occurred.

Assignment format

Please use a clear typeface such as Ariel, 12pt and use diagrams, tables and charts and appendices where appropriate. Staple all sheets of the report together. Use a header or footer with your name and page number to help identification of any page should it become separated from your report. Please state a total word count for the main text. Please do not use plastic covers and binders. Spell check and proof read all work and make corrections before handing in the final copy.

Appendix 2

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Undergraduate Assignment Record

Individual Assignment

Name	*A. Anon*
Student ID Number	*0000000*
Semester (please circle)	One/(Two) Module Number/Title ET 4052 Engineering Foresight – *Video Game*
Assignment Title	Market and Technology Foresight Envisioning Report
Tutor/Module Leader	Tim Jones
Date due in	27 April 2006 Date handed in, if late (On time)
Name of Marker	Tim Jones

Comments		
Introduction 5%	*Title of report? Main points OK. Diagram/Photo – show the product*	*4*
The current product 15%	*Quite a bit on the product market. Need to give a reference for each figure/table etc. Product features are...*	*11*
Major external influences 30%	*Well structured 'debate' taking in a range of factors*	*27*
Specific scientific and technological developments 20%	*Brain-links + hand held feedback/interfaces. Anything on VR Software? Other aspects. Portability (PSP etc.)*	*15*
Specific market prediction 10%	*Rather too vague/general. Tends to repeat above on external influences. Focus on the product niche.*	*4*
Summary 10%	*Main points drawn together, justifying the recommendation.*	*7*
Personal project diary 10%	*Interesting account of GANTT. Also problem of how much to speculate ideas*	*9*
Points to note	*Good report. Slightly hesitant to state 'this is the way forward because of xyz...'*	

Office Use Only	1st Marker		2nd Marker		
Date Received	Mark/Grade	Penalty	Mark/Grade	External	Final Grade
					77

Appendix 3

Manchester Science Enterprise Centre

Technology Enterprise with Tools and Techniques

ET3001 (MSEC UG04)

Semester 1 Assignment

December 2005 general feedback

I was most impressed with the standard of the reports submitted. Many were prepared to a very high standard and would be capable of being tabled at a business board meeting. The feedback below is provided for your information.

All assignments have been marked using an individual sheet which has on it hand written comments relating to each section of the report submitted. Please read these comments which are personal to you. Alongside you can see the mark awarded for the section and at the bottom the overall percentage for the assignment. The mark does no include any deductions for being late etc.

The following are a few general comments which relate to some assignments only. They may be informative for everyone to read.

General layout

Most reports were presented well. Some students missed a heading to tell the reader what the report was about! Some kept the reader guessing for the majority of the introduction. It is critical that the start of a report gets straight to the subject and lets the reader know exactly what is contained within it.

Page numbers were often omitted, and page breaks appeared in odd places. Some diagrams and charts were illegible when set within the document, often because they had been scaled to miniature proportions. These are all minor niggles which just make the report look unprofessional for the cost of just a few minutes additional work.

Market

Many students made extensive, referenced, use of Mintel and other well respected sources of secondary information. Higher marks were awarded where the report used the information to support the specific product being analysed. Lower marks were given if blocks of Mintel were quoted with no analysis, leaving the reader to make their own mind up about how to interpret the data.

User benefits

Students who simply listed product features, without explaining how the feature provided a benefit to the user, scored lower than those reports where each benefit was fully explained.

Technological developments

Some reports restricted the horizon of search for new technologies to the specific product sector only. This approach would cause problems for the company as it would miss developments in other sectors which might be just right for transfer into 'your' product sector.

Intellectual Property Protection

Most reports contained some information on Patents. It was disappointing that many reports stopped at this stage and did not go systematically through all forms of IP. For example, there were several reports

on iPod which failed to mention the Apple and iPod Trade Marks. These obviously have significant value to the company.

Performance Specification

This was generally well structured and explained. Some reports announced radical new ideas for the first time here. This 'sudden announcement' surprises the reader, since the more logical approach would be to take guidance from the previous Market and Technology sections and base the new specification on this work. Some specification items were very similar to each other, so were counted together for the purpose of mark allocation.

Diary

The diaries were most interesting and useful and have provided valuable information for course design for the future. Thank you.