Creating a project-based on-line learning environment for MBA economics students

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***Abstract**: This paper describes the objectives, design and preliminary evaluation of a project-based, on-line postgraduate economics program which forms part of the Masters of Business Administration (MBA) degree offered at Edith Cowan University. The program has been structured so as to create, as far as possible, an authentic learning environment in which students develop an understanding of economics through the application of economic concepts to 'real world' business. Curriculum and assessment design reflects the authors' attention to a number of pedagogical dimensions which introduce elements of a constructivist learning environment. The authors believe these changes have resulted in greater students engagement in the application of economic techniques and a deep conceptualisation of the role of economics in business.*

***Keywords**: on-line learning, constructivist learning, economics, authentic learning, business education.*

Introduction

This paper discusses the development of a taught postgraduate unit in economics over the period 1998 - 2001. Economics is usually included in the MBA curriculum because it is perceived as 'useful for decision-making'. However, MBA program designers often see this usefulness as axiomatic rather than something that has to be demonstrated. In our view this usefulness should be explicitly 'designed in' and continuously verified, rather than left to chance. Our objective was thus to create a learning environment in which students could acquire some elements of the economics 'toolkit' and immediately apply those in an engaging way by constructing their relevance to business strategy.

A problem and an opportunity

> *The Exec kept asking me, So What? Why should I learn this? How can we use it? How do you know what you are telling us is true? How can it help us Execs make better decisions? (Shlomo Maital 1993, viii)*

In a not altogether tongue-in-cheek parody of the situation faced by economics in modern business education, Maital (1993) imagines a world made up of two tribes – the 'Exec' and

the ‘Econ’. The former seeks rapid access to ‘useful’ knowledge from whomsoever can supply it; the latter, who traditionally supplied great quantities of knowledge to the 'Exec', now finds it increasingly difficult to persuade the 'Exec' of that this knowledge transfer is worthwhile. Accordingly, the 'Econ' must find new ways of distilling their knowledge and packaging it in such a way that it appears both relevant and digestible to the 'Exec'. The result is “*Executive Economics*” – “ten essential tools” for business managers (1993, vii-x).

Typically, students in postgraduate diploma and MBA programs complete a range of semester length ‘core’ studies before they specialise in an area of particular interest. The ‘Econ’ face an immediate problem in servicing such courses. Fearing that economics is perceived by potential students as too difficult (too mathematical, too rigorous) or simply irrelevant (too abstract), course coordinators *in other subject area*s, place pressure on the ‘Econ’ to popularise their subject. Meanwhile, from within the ‘Econ’ tribe itself there is a temptation to make up for lost teaching opportunities by squeezing as much traditional economics into these residual units as possible. The outcome of such a marriage is not likely to be satisfactory. Whilst many students can achieve success on traditional criteria such as passing tests and examinations, the question remains as to how many of them are able to engage with the material they are studying – to find the experience worthwhile and to recommend it to the next generation of students. As members of the tribe of ‘Econ’, the authors of this paper have had to find ways to stay competitive in a setting where the ‘Exec’ now exerts significant market power.

Apart from the need to address the perceived marginalisation of economics, a second source of motivation (perhaps a synonym for pressure!) arose from our involvement in the Masters Online project at ECU (see Herrington, Sparrow and Herrington (2000) for a description of this project). This provided us with the opportunity to seek a better fit between a model of knowledge construction informed by research about teaching and learning and the emergence of new opportunities for communication provided by the Internet.

Conceptions of learning

A review of learning literature uncovered a number of different expectations and conceptions of the learning process held by students (and perhaps by their teachers). Harper and Hedberg (1997) for example, suggest that learning might be:

- acquiring information or ‘knowing a lot’ - storing information for reproduction.
- the acquisition of facts, skills and methods which can be retained and used as necessary.
- relating parts of subject matter to each other and making sense of that relationship.
- understanding and interpreting reality in a different way – comprehending the world by reinterpreting knowledge.

Gibbs' (1992, 470) five level scheme establishes a dichotomy between surface and deep learning. The first three levels (learning is given knowledge; learning is reproduction for assessment; learning is applying algorithms to problems) are described as surface approaches. The final two (learning as making sense by abstracting meaning from the learning experience; and learning enables the student to see the world differently) as deep approaches. A number of other descriptions seem applicable to these conceptions - including ‘low order-high order’ (Bloom's taxonomy); ‘expert – novice' (Van Sickle 1992); and Heath’s conception of the ideal learner as being a "reasonable adventurer" (Entwistle and Ramsden, 1983, 11).

Following Reeves (1992) and Reeves and Laffey (1999), we established a set of 'pedagogical dimensions', shown in table 1, as the basis for the redesign of this unit.

Dimension	Continuum
The objectives - what defines important knowledge, concepts and skills in the curriculum?	highly specific ---------- generalisable
The pedagogical environment.	objectivist ---------- constructivist
The role of the instructor	didactic ---------- facilitative
The nature of learning activities	replication ---------- generation
The motivational dimension	external ---------- internal
The assessment dimension	rote memorisation ------- authentic problem

Table 1: Pedagogical dimensions

Such dichotomies "move from a sponge view to a view that requires the learner to work actively to understand the evidence they receive from the world and be aware of any framework of process which they apply to its interpretation" (Harper and Hedberg 1997,3). It seemed that one answer to our initial problem was to shift our thinking about teaching and learning 'towards the right' on each pedagogical dimension to create a learning experience which would be deeper and more engaging.

According to Entwistle and Ramsden (1983) the deep learning approach involves a desire to relate learning to personal experiences outside study, to see it as part of personal development; to seek relationships which help integrate the parts into a whole and to integrate the underlying structure or intention of the whole task. Just what the 'Econ' always knew about economics!

Entwistle and Ramsden make an important point, however. The approach to learning should not be seen as a characteristic of the student, but as a response to a situation. We thus focussed our attention on how to design the required situation. Much of the literature referred to constructivist learning environments, their characteristics, and how to build them (see, for example, Jonassen (2002). According to Oliver, the strengths of constructivism lie in its emphasis on learning as a process of personal understanding and meaning making which is active and interpretative (2001, 410). Oliver refers to a number of authors who identify principles that underpin learning in constructivist settings. For example, Grabinger (1996) lists:

- learners transfer learning with difficulty, needing both content and context learning
- learners are active constructors of knowledge
- learning is in a constant state of growth and evolution
- learners bringing their own needs and experiences to learning situations
- learners acquire skills and knowledge within realistic contexts
- assessment is realistic and holistic.

For us, there are significant similarities in descriptions of constructivism and descriptions of authentic learning situations. Herrington, Oliver and Stoney (2000), for example, suggest that learning environments in authentic contexts 'must be all-embracing and provide a sustained and complex learning environment that can be explored at length' (2000, 88). The Masters On-line model referred to above proposed that knowledge construction would be best facilitated by the creation of learning environments which, among other things, provided authentic contexts and activities, aligned with assessment of learning integrated within tasks which promoted reflection, drew out tacit knowledge and allowed sustained abstract thinking. According to Carr-Chellman and Duschatel (2000), good online units are characterised by a blend of delivery media (including a study guide and printed text); the use of a number of

forms of communication to connect learners; activities to support interactive skill-building; and the use of an assignment as a context for learning.

Biggs (1999,63) makes the point that what the student does is actually more important in determining what is learned than what the teacher does. His notion of "constructive alignment " is that each of the components of instructional design addresses the same agenda and supports one another. Lack of alignment, he suggests, cannot reinforce the objective, which is to create a situation in which students are most likely to take on a deep approach to their learning.

Laurillard (1993, 1995) recommends that learners be presented with an information rich environment where the learner controls the process of discovering knowledge. The environment should promote discussion between the learner and teacher, interaction between the learner and some special aspect of the world defined by the teacher, adaptation of that special world by teacher, and adaptation of actions by the learner, and finally, reflection on the learner's performance by both the teacher and learner. An on-line learning experience would ideally include ample interaction and conversation between the learners, their peers and the teacher.

Economics and Strategic Thinking: An Overview

Having established what the blueprint should look like, we came across the problem of achieving constructive alignment within a framework that was practicable to organise, resource and operate. The conceptual vehicle used to link economic theory and business practice is one familiar to MBA students - strategy and strategic thinking. Strategic thinking is a high order integrative activity which is best taught in a context when the examples are deliberately realistic and rich in information, yet also infused with strong organising conceptual frameworks (in this case, economic ones). In the context of business studies strategy has been defined as an idea which links together the functional areas of a firm (or organisation) and relates its activities to its environment. The role of economic thinking in modern strategic thinking is very important.

In the objectivist paradigm, students would learn content in order to solve a number of strategic problems or cases provided along the way as example of the way theory could be applied. We decided to reverse the sequence – to use strategic thinking as a way of solving the problem to apply the learning. We wanted our students to manage complexity and think like (small business) practitioners.

A major project creates the authentic environment. Students are required to *'conduct a competition and environment analysis of the firm that you have selected for study. Devise a competitive strategy for this firm to cover the next four years'.* We believe the project fits the bill for an open-ended, ill-structured task which creates a meaningful context for further work. The task also clarifies the unit objective and communicates the need for students to 'get there'. For most students, the chosen firm is the context through which all teaching and learning activities can be visualised. The project seems to carry considerable motivational impact – four fifths of students select firms of direct interest to them (as worker; owner; competitor; supplier; or potential entrant).

Jonassen (2002) says that for students to engage in meaningful learning, they must manipulate the environment in some way. To create the 'problem manipulation space' in which this could occur, we referred to the many models for strategic thinking which are available (see, for example, Harding and Long, 1998; Montgomery and Porter, 1991) and selected the well-

known and ‘5 forces of competition’ model (Porter, 1980). In its simplest form this model is relatively straightforward to explain, however, it is capable of substantial refinements. The model is based on the concept of ‘driving forces’ – factors which drive change in the structures of competitive markets and which give firms the opportunity to establish a ‘competitive advantage’. The model suggests that a winning strategy is built on objective assessment of the firm's economic environment.

The Porter model provides a useful problem manipulation space and an ideal 'scaffold' for the teaching learning process, as suggested by figure 1.

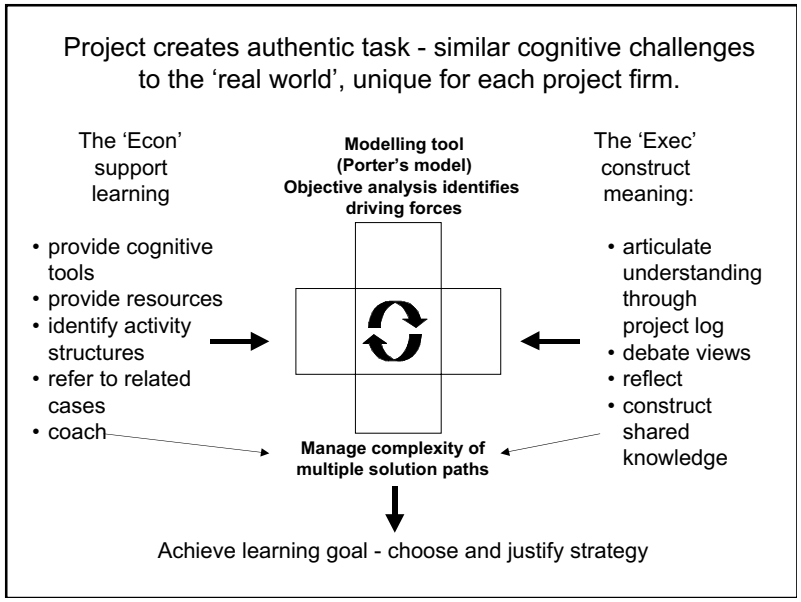

Figure 1: The Porter model as a teaching/learning framework

The model is easily disaggregated - for example, it is possible to embed notions of trade-offs, opportunity cost, marginal thinking, economic motivation, specialisation and trade, markets, and the role of firms in the organisation of production and creation of wealth. Its aggregated form provides a framework for high level systematic analysis of broad representations of complex reality. This is the really interesting part of economics but is difficult to master. In a real sense, the combination of the model and the task creates the curriculum for the student. Our role as instructors then falls (rises) to leading the students through a process of discovery using items from the ‘Econ’ toolkit.

Of course, this is where elements of a conventional approach creep into the instruction process. It is probably true that many instructors begin their programs with constructivist notions and authentic situations in their head but after a few weeks, fall back to the ‘old’ objectivist teaching patterns. To avoid this possibility, we have consciously worked on creating tasks within tasks, emphasising questions that could themselves be projects to introduce further tools of analysis. Examples of our questions are shown in table 2.

Those who have studied economics will recognise the basic theory of markets; price determination; elasticity; technology, production and costs; market structure; and the business cycle in the sample above. Because these concepts are the basis of answers to the questions in the left column, rather than descriptions of the topics in the right, the tasks reinforce the authentic context of the firm and its strategic direction. To reinforce this support, we instituted a week-by-week “progress log” - a reflective diary which communicates the extent to which

students have developed higher order outcomes. The log is completed by hard copy, fax or e-mail in the face-to-face environment. External students use an online database module. Both methods enable students to review the contributions of their peers, and establish a basis for communication between them. The reflective nature of learning established by the journal and the project finds us answering questions which are more of the 'where does this fit' variety then the 'what does this mean' variety – our role as instructors has taken on a more facilitative side.

Authentic learning environment	Traditional learning environment
"how does my firm add value to the good or service we sell in the market?"	profit, as the measure of economic value, is the difference between benefits created and costs incurred.
"what are the characteristics of my rival group?"	the characteristics of markets.
"what are the driving forces at work in my firm's sector?"	the influence of 'market forces' on competitive equilibrium (short term only).
"what risks may emerge from the economic environment?"	the effect of business cycles, government policies and changing international circumstances.

Table 2: Engaging questions

Involvement in the Masters On-line project has encouraged us to develop a wider variety of resources which students can access as they construct meaning. As recipients of a Teaching and Learning Small grant in 2001, we have begun to build a library of short (2 minute) video clips which will be accessible on a CD or the Internet. We constructed approximately 20 questions which flesh out the questions reviewed in table 1 above, and remind us of the questions which students often ask as the unit progresses. We then sought the responses of real 'Execs' to two or three of the questions (their choice). The questions (and the answers) are timeless and central to the economics of corporate strategy. We as 'Econ' have not been surprised by any of the answers the real 'Execs' provided. We hoped the video clips would help us to prove that much of the world is, from an economic point of view, a reliable and simple place (and they do). They also help our student 'Execs' to connect with the 'real world' of business and acquire deeper and more authentic knowledge than they may have initially felt that the 'Econ' could provide.

Those who have studied economics will know that its principles are typically presented in terms of mathematical and graphical models. Texts on managerial economics, for example, allocate much space to discussion and computations of marginal analysis based on the neoclassical view that the 'best' result for any problem will be the point where the marginal benefits to be derived from any course of action are just equal to the marginal costs of carrying out that action. This is not wrong, nor far removed from strategic thinking, but when expressed mathematically often tends to confuse rather than enlighten. This problem invited us to apply the spreadsheet in an online environment as a rich teaching learning resource. The spreadsheets assist in the construction of understandings because they reduce the manipulation of algorithms and provide answers quickly and accurately. Graphs embedded in each spreadsheet enable students to see how changing parameters such as costs can affect profits, or how price elasticity affects consumer reactions to pricing decisions. We feel the videos and spreadsheet resources go some way to what Jonassen (1991) describes as "learner selectable information". There is no requirement for students to use this information, but it may help many students to construct their own models and apply these to their chosen business.

Two tests are included in the unit program, but we have taken steps to ensure that these are aligned with the rest of the program. Test 1, in about week 7, requires students to characterise and analyse the market in which their project firm is a participant. Test 2, in about week 11, requires the manipulation of macroeconomic data to interpret the state of the economy and recognise its strategic implications for the project firm. Because the context of each test is the student's chosen firm, answers must reflect more than just the acquisition of information. Both tests are 'take home' tests completed over a 36-hour period.

Evaluation

An early attempt to evaluate the impact of the constructivist design used an input-output approach in which overall unit score and project score were regressed on a number of independent variables - the two test results and the pretest score were the only independent variables which were not categorical. We hypothesised that age, length of work experience, and reported time in a management role would have positive influences on the assignment score, as we thought that, together, these factors would suggest some experience in solving unstructured problems. Previous exposure to formal courses in economics, the pretest score, and the two test results were also expected to be positively related to the assignment score. Students also completed the Study Process Questionnaire (Biggs, 1987) which purports to measure the deep learning / surface learning orientation of students. It was presumed that a deep orientation would be positively correlated with success on the final assignment. Initial results were inconclusive, and the experimental procedures encountered the problems that have been noted in the literature regarding quantitative research into 'input-output' models of economics education (for example, Shanahan et al, 1997). These concern how to design an experiment which measures the specific influence of one variable on student success, and the ethical and practical difficulties of doing so when there is no control group or when groups inadvertently receive different treatment.

We also sought to evaluate unit design and teaching effectiveness using the university's official unit evaluation questionnaire. In semester 2, 2000 student evaluations, unit design and content was rated at 3.6 (on a five point scale). This compared to a mean of 3.06 (standard deviation 0.28) for other units at both graduate and undergraduate level in the principal authors' school. On other constructs, the unit rated 3.6 for 'generic skills' (school mean 3.32, standard deviation 0.26); 3.82 for 'assessment' (3.51, 0.27); 4.44 'overall unit score' (3.57, 0.42); and 4.55 for 'teaching effectiveness' (3.66, 0.52). Unfortunately, unit design and teaching effectiveness scores from other units in taught diploma and masters business courses were not available. The efficacy of this within school data is compromised to some extent by the range of levels over which comparisons are made. A further limitation of these results is that evaluations of the unit undertaken prior to the changes are limited and thus difficult to compare to recent results.

An extension to this evaluation uses a thirty item Likert-type format. The items are grouped into subscales intended to capture student views on unit design and content (workload, clarity of objectives); assessment methods (whether assessment tested memory or understanding); generic skills (problem solving, analytical skills, teamwork, written communication, and planning and organisational skills); engagement (effort and thought applied); relevance and learning efficacy. The last three categories are of most interest in evaluating this unit, and rated 3.81; 4.25 and 3.81 in the most recent completed semester. Evaluation scores are higher than those achieved prior to the redesign of the unit, and suggest that current instructional design of the unit has achieved its pedagogical objectives.

As figure 2 suggests, grade distributions from 1998 – 2001 show a marked shift away from failure to success (in the formal sense).

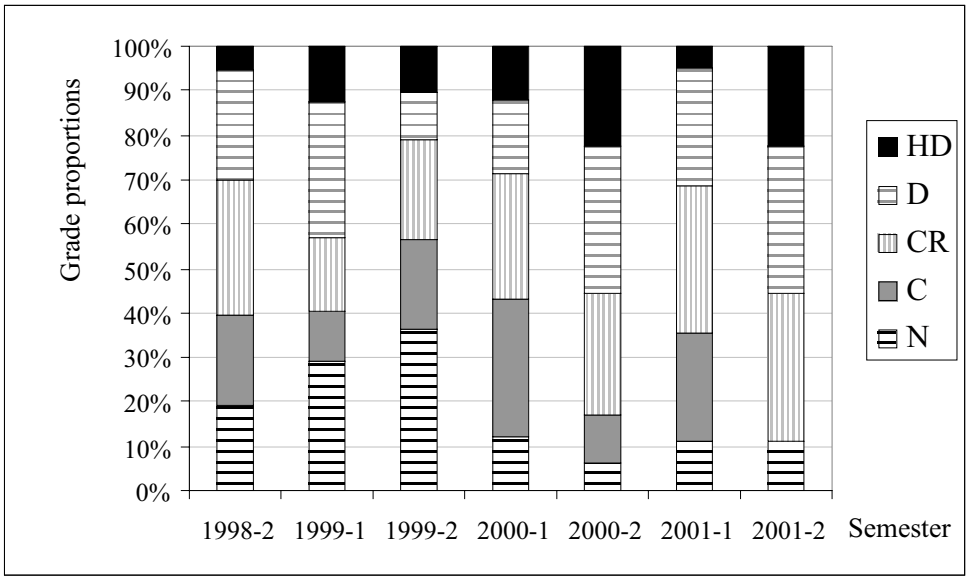

Figure 2: Grade distribution: 1998-2001.

Combining these descriptive statistics suggests the project has achieved its instructional aim - an ill-defined problem in which as much learning took place in defining the problem as was the case in solving the problem (although this is not to suggest that all students where successful in either stage).

Future research plans centre on surveying past students' perceptions of the relevance of economic concepts as taught through this process. Our views as instructors are positive - the 'reverse engineered' unit is now highly focussed and appears to successfully use the business strategy theme to develop and consolidate core economic concepts at both macro and micro level. We find considerable evidence in the submissions that most students have achieved depth of understanding and have applies the 'Econ' principles to 'Exec' decisions.

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