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Abstract

This paper presents and discusses the design and evaluation of an innovative educational exercise that combines elements of both learning about and learning for e-commerce. The principle guiding the design of the exercise was the provision of an opportunity for postgraduate information management and information systems students to learn about and for e-commerce through the collaborative development of a business plan. A survey distributed at the end of the module collected data on students' acquisition of knowledge and skills related to their learning about and for e-commerce on the business plan exercise. The data analysis focuses on students' acquisition of knowledge and skills relevant to entrepreneurship, and demonstrates that the collaborative development of a business plan can be an effective learning tool for students to acquire not only specific domain knowledge of e-commerce topics such as business strategy, e-commerce business models, and e-commerce technology, but also generic information, communication, and management skills, relevant to learning about and for entrepreneurship.

1.   Introduction

As a response to the competitive challenges of the knowledge-driven economy, the United Kingdom (UK) government recently published a report encouraging higher education institutions to incorporate learning for enterprise into their curricula [4]. The UK government's promotion of enterprise has also included the award of grant support to universities via the government's Science Enterprise Challenge. Support from this grant led to the establishment in 1999 of the White Rose Centre for Enterprise (WRCE) (http://www.wrce.org.uk/). This paper reports on the first stage of the WRCE-funded project called *Managing Innovation in the Digital Economy* (http://www.wrce.org.uk/elbidshef.htm). This project aims to incorporate enterprise learning into postgraduate and undergraduate curricula in information management and information systems.

Higher education curricula for e-commerce can be broadly considered to be of two types: curricula *about* e-commerce and curricula *for* e-commerce [7]. A curriculum designed for students to learn about e-commerce normally focuses on introducing and developing conceptual models of e-commerce. The approach is taught in a conventional manner through lectures, textbooks, and essay writing. A curriculum designed for students to learn for e-commerce aims to create a learning environment that enables students to acquire knowledge and skills relevant to the practice of e-commerce. This paper presents and discusses the design and evaluation of an innovative educational exercise that combines elements of both learning about and learning for e-commerce. The principle guiding the design of the exercise was the provision of an opportunity for postgraduate information management and information systems students to learn about and for e-commerce through the collaborative development of a business plan.

2.   Entrepreneurship and the Knowledge-Based Economy

An entrepreneur is commonly considered to be someone who starts up their own, new, small business. Not every new small business start-up represents an example of entrepreneurship though in its economic sense. The concept of entrepreneurship rests on economic theory that argues that the entrepreneur "shifts economic resources out of an area of lower and into an area of higher productivity and greater yield" [3]. This definition taken from the eighteenth century economist, J.B. Say, was intended as a manifesto and a declaration of dissent: the entrepreneur upsets and disorganizes. In the same vein, the economist Joseph Schumpeter has postulated that changes, which upset economic equilibrium, are due to an innovative entrepreneur who sees change as the norm and as healthy to economy. These changes are considered to be opportunities for the entrepreneur to innovate, to create new ways of doing things, and to create resources for further economic and social development. It is in this context that the management theorist, Peter Drucker defines entrepreneur and entrepreneurship as follows: "the entrepreneur always searches for change, responds to it, and exploits it as an opportunity" [3].

The concept of entrepreneurship is often allied with the concept of innovation. Such innovation does not have to be a technical innovation or even result in a tradeable product. An innovation can be social, for example, changes in an education system or a national health service can be considered to be social innovations because they have a profound impact on society and economy as a whole.

Entrepreneurs and the practice of entrepreneurship can be found in every walk of life and in any organization.

During the technology boom of 1999-2001 an increasing number of entrepreneurial initiatives were undertaken on a global scale. Indeed, the Internet commentator Manuel Castells writes: "without the action of these entrepreneurs, oriented by a specific set of values, there would be no new economy, and the Internet would have diffused at a much slower pace and with a different range of applications" [1]. The launching of these entrepreneurial initiatives was most popular among the young. This was in part because younger generations are exposed to new waves of technology development to a greater degree than older generations. Younger generations also possess a heightened awareness of the potential business opportunities offered by such technologies (e.g. Boo.com, Lastminute.com, Yahoo.com). Unlike their older counterparts however, younger people can often lack essential experience in planning, organizing, and managing businesses; and this lack of experience has been a contributing factor in the failure of many dot.com businesses to make a sustainable profit and subsequently collapse when their initial cash flows have dried up.

In the new economy, traditional methods of conducting business still persist. In addition to these traditional methods however new business instruments and thinking are required too. In the new economy, where knowledge-based products and services are the source of organizations' competitiveness, there are a variety of technologies to support the development and distribution of these products and services. The value of these knowledge-based commodities rests on their symbolic representation of information and not on their manufacturing value. Hence organizations need to be able to represent and manipulate information effectively. Modern technologies, particularly digital technologies, can be employed to support the production and consumption of such symbolic or intangible goods.

In a knowledge-based economy, network technologies represent both an opportunity and a threat for organizations. On the one hand such technologies act as tools that can help accelerate the process of innovation within an organization, at both technical and organizational levels. On the other hand the speed of replication that networks afford, particularly with regard to the production and consumption of digital products, can represent a competitive challenge. This duality of opportunity and threat makes engagement in innovation a key function in the knowledge-based economy: "in an e-economy based on knowledge, information, and intangibles…innovation is the primordial function" [1]. Although some commentators have argued that it is not possible to plan for innovation, manage it, or design organizational structures and processes to support it, other commentators have suggested that a systematic approach to the innovation process can be taken. One such approach

suggests that there are five elements to the entrepreneurial innovation process. These elements are: preparation, incubation, insight, evaluation, and elaboration [5]. Each element involves a set of knowledge and skills that a successful entrepreneur is expected to have acquired.

2.1 Preparation

Opportunity recognition (OR) is the initial stage of the entrepreneurial process. OR can be defined as "either a) perceiving a possibility to create new business or b) significantly improving the position of an existing business, in both cases resulting in new profit potential" (Christensen, Madsen, and Peterson, 1989, quoted in [5]). The same argument is shared by others (e.g. Kirzner, cited in [5]) who state that the discovery of opportunities is the core issue of entrepreneurship. Hills et al. [5] define preparation as the background and experience that an entrepreneur brings to the opportunity recognition process. In the context of the current paper, an entrepreneur needs a knowledge base to draw on in order to identify opportunities. This knowledge base usually derives from an individual's personal experience, education and training, and knowledge of particular fields.

2.1 Incubation

Incubation is the part of the opportunity recognition process in which the entrepreneur contemplates ideas or specific problems. Hills et al [5] and other commentators argue that incubation is neither about conscious or scientific problem-solving nor about systematic analysis, rather it is about having an intuitive sense of problems, and involves unstructured thinking of alternatives to the problems faced.

2.2 Insight

Unlike incubation which refers to an ongoing process, insight usually refers to a moment of recognition. Three types of insights may occur. First, is the experience of a spontaneous recognition of a business opportunity or of a solution to a problem. Second, is the moment when a person seizes the idea that solves the problem that they have been considering for some time. Third, is the recognition of a business opportunity or problem solving idea that arises from a person's participation in a social network. Recent research has indicated that entrepreneurs with a wider network of social contacts and comparatively greater social capital are more likely to succeed compared to those with a narrower network of social contacts and less social capital.

2.3 Evaluation

Evaluation is the stage at which insights are analyzed systematically. This involves a series of activities which validate the ideas. These activities include research into

whether a concept is workable, whether the idea is original and has potential, whether the idea creator has the knowledge and skills to achieve it, and whether there is a market for the development of new products.

2.4 Elaboration

Elaboration is the phase at which creative insights, subjected to systematic analysis at the evaluation stage, are converted into a form ready for final presentation. It is at this stage that the practical details of the business idea are worked out with care. Entrepreneurship has always been associated with the image of high risk business however Hills et al. [5] argue that it during the process of elaboration that the skillful entrepreneur engages in planning activities in order to reduce risk. These five elements of the entrepreneurial process are by no means sequential and linear. Feedback from later stages to earlier stages is possible. The results of the evaluation stage for example may need to be fed back to the incubation stage for more earnest consideration. Similarly, during the elaboration stage individuals may be asked to feedback to earlier stages of the process in terms of further preparation, incubation, insight, and evaluation.

During the process of entrepreneurship a number of factors will have an overall impact on the process including personal traits, personal cognitive style and social competence. Social competence has become increasingly important, as a substantial proportion of creative insights are generated by teams of entrepreneurs rather than single individuals and new ventures usually need to obtain their venture capital from the market. It can also be argued that social skills such as impression management, social perception, and persuasiveness strongly affect the outcomes experienced by individuals in many contexts including job interviews, yearly performance reviews, and negotiation. In addition, social competence will have an impact on face-to-face interaction between individuals within the same entrepreneurial team, and between potential entrepreneurs and investors. It can also be argued that effective interactions with others may help entrepreneurs in performing important tasks such as negotiation, raising capital, building business relationships with suppliers and distributors, and so on.

Bearing the above arguments in mind, we argue that the facilitation of students' acquisition and development of the necessary knowledge base and skills needed to engage in the entrepreneurial process should be at the heart of teaching entrepreneurship. As discussed earlier, each step of the entrepreneurial process involves a set of activities and those activities require particular knowledge and skills in order to generate the input required for subsequent activities. The teaching of entrepreneurship should focus on developing the necessary knowledge and skills for each step and for the process as whole.

Table 1. Entrepreneurial knowledge and skills

Step	Knowledge	Skills
Preparation	Domain specific knowledge	Problem framing; identifying relevant information; information searching and location.
Incubation	Domain specific knowledge	Creative thinking
Insight	Domain specific knowledge	Problem solving
Evaluation	Domain specific knowledge	Identifying relevant resources; information locating, searching and gathering; synthesising data; extracting, evaluating and organising relevant information, industry analysis; critical analysis.
Elaboration	Business planning; marketing; project management; organisation and management knowledge, risk management.	Managing project; planning business; assessing risk; attention to detail; presenting data.

Table 1 summarizes the set of specific knowledge and skills that can be acquired in class. Social competence is assumed to be a generic interpersonal skill. Although social competence is not usually taught in an e-business and e-commerce classroom setting, it can nevertheless be learned by students as they engage in team-based educational exercises.

3. Curriculum Design

The *E-Business and E-Commerce* module is a postgraduate module designed mainly for delivery on the M.Sc. Information Systems (IS) and M.Sc. Information Management (IM) programmes, within the Department of Information Studies at the University of Sheffield. Both programmes of study are conversion programmes designed for those students who are interested in IS- or IM-related subjects but whose first degree may or may not be within an IS or IM discipline.

The curriculum design is based on two general observations of the business sector. First, the myth that the new economy has been caused by e-commerce or by the Internet. Indeed many commentators have overplayed the importance of the Internet or major new technologies (i.e. mobile computing, WAP) and underplayed the fact that economic law remains more or less the same [6]. This first

myth of the new economy leads to a second myth: that compared to the old economy, barriers of entry into business in the new economy are lower. A general feeling is that doing business online is easier than doing business offline and that it is easier to enter and exit an online market. This conception of e-commerce often leads individuals to believe that setting up an online business does not need to follow a series of procedures that conventional businesses would otherwise follow e.g. business planning, risk assessment, business model and strategy. Evidence demonstrates that the lack of detailed planning in many start-ups is one of the major reasons for their failure (http://www.businessplanarchive.org/). The curriculum design of the *E-business and E-commerce* module emphasizes the fact that the fundamental economic and business principles of e-commerce in the new economy are by and large no different from those of businesses in the old economy. Within the context of an increasing number of start-ups, many of them are noticeably run by young entrepreneurs [1]. In recent years, the British government has been committed to the promotion of enterprise and innovation in industry (http://www.dti.gov.uk/for_business.html). The UK's Department of Trade and Industry for example provides various services to small and medium sized enterprises and start-ups in order to ensure that businesses receive necessary and adequate support from government. The Office of the e-Envoy was established by the British government to ensure that the country, its citizens and its businesses derive maximum benefit from the knowledge economy (http://www.e-envoy.gov.uk/). These initiatives aim to exploit innovations of any kind in order to sustain economic growth.

On the basis of the above observations the overall aims of the *E-Business and E-Commerce* module are (a) to emphasize fundamental economic and business principles and to give both traditional and new business models equal consideration; and (b) to encourage students to think creatively and provide an opportunity for them to experience the entrepreneurial process during the course. Three areas that the curriculum design is intended to address are: domain specific knowledge, intellectual skills and social competence. Domain specific knowledge refers to business-related knowledge, and in this case refers to knowledge of e-business and e-commerce in particular. Students are expected to develop domain specific knowledge through lectures, seminars, writing an individual essay, and doing a group assignment. This is learning about e-commerce.

Intellectual skills and social competence are expected to be developed through a group exercise set for the module: the collaborative development of a business plan. Through group collaboration in starting up a new business, students not only further their intellectual skills but also develop their social competence. This is learning for e-commerce.

3.1 Collaborative business plan

Students were asked to develop a collaborative business plan on the basis of one of three case scenarios developed for the module. These scenarios were drawn from three different industries: music, information, and retail. The first and second cases focus on the development of digital products and services, while the third case focuses on traditional retailing. Developing a business plan on the basis of these case scenarios takes students through an entrepreneurial process, from initiating business ideas (preparation) to planning details (elaboration).

The provision of case scenarios was in a number of ways similar to business case studies used for teaching and class discussion. First, the problem situation presented in the scenarios allowed students to step metaphorically into a decision-maker's shoes [9], where learning can take place through the submission and collaborative testing out of ideas, and the iterative application of the combined effort to the problem at hand. Second, the case scenario helps students to develop a set of principles and concepts that can be applied in practice [2]. Through the case scenarios students are able to develop their ability to identify problems, deal with complex and ambiguous situations, and to take decisions and determine action plans. Third, in order to provide solutions to the problems, in this case to develop a sound business plan, students need to apply their domain knowledge and bring appropriate tools to bear on their analysis of the problem. As has been suggested by others, such an approach helps students to develop a set of skills that includes applying their knowledge to complex situations, formulating critical analysis, and making decisions [6]. Finally, the case scenarios are intended to encourage students to make assumptions about how they might frame their business opportunity students have the flexibility to imagine different alternatives. This not only sharpens students' industry analysis skills but also encourages students to think creatively. Indeed such flexibility is essential to the students' entrepreneurial experience.

As mentioned above, three case scenarios were prepared to describe three different types of companies located in three different industries ranging from music, information and retail. Reasons for choosing these three industries are twofold. First, these industries are currently facing challenges caused by digital technologies. For example, the retail sector faces a dilemma of going or not going online because either option will afford different opportunities but at the same time present different challenges to retailers. The information industry is facing problems of pricing information on the Internet, while the music industry is facing pressure through falling CD sales and an increase in the number of music websites which allow free music download. Second, these three industries are close to students' everyday life and students are hence able to draw together their observation, experiences, and general knowledge to generate business ideas.

Students were expected to draw up a collaborative business plan on the basis of the scenarios. They had the opportunity either to launch a start-up company or to launch a new online products and services division within an existing offline company. The structure and content of the business plan should be almost the same as a standard business plan, consisting of an executive summary, company description, industry analysis, product and service, business model, marketing and business strategy, management team, and financial forecast. In order to develop their business plan, students were asked to analyze the case scenarios in order to frame the problems that the company currently faces, find information about the current developments in the industry in which the company is located, analyze the developments in the industry to evaluate their business ideas, and apply their knowledge of marketing and business to formulate their strategies. The exercise provided an opportunity for students to further their domain specific knowledge by applying it to the exercise and to develop their intellectual skills and social competence through interaction with fellow students.

3.2   Implementation issues

Thirty-four students signed up for the module for the 2001-2002 academic year. The student body was diverse in terms of nationality and gender. Fifty per cent of students were home students and fifty per cent of students were international students. The gender distribution of the group was also fifty-fifty. All students were assigned to a group of four by the module coordinator. The decision about assigning students to their groups rather than allowing them to choose their own groups in this instance is based on pedagogical grounds.

First, there can be a tendency towards a divide between home and international students with students from the same cultural background or country tending to work together. A gender divide can also occur. Female students tend to work with female students while male students tend to work with male students. In an effort to encourage students to work together regardless of cultural background or gender, the decision was taken to mix students evenly on the basis of these two criteria. Second, it can be argued that forming a diverse business team can help generate good ideas as people from different social, cultural and ethnic backgrounds are able to provide valuable contributions to business ideas from different perspectives. It can also be argued that nowadays working in a diverse work environment is almost inevitable and hence students should be prepared for working with individuals from different backgrounds. Third, through working in an international team, students' social competence can be further enhanced. There were eight groups in total and copies of the three case scenarios were distributed. Groups were asked to take a decision about which scenario they would develop for their collaborative business plan. In order to avoid a situation where students

over subscribed to a particular case allocation to each case was limited to a maximum of three groups. Three seminars were organized to provide groups with an opportunity to present their business plan to other groups and to gain feedback from tutors and their fellow students. In the first seminar, the groups presented their industrial and market analysis. In the second seminar, the groups presented their draft business plan. In the third seminar, the groups presented a near-completed business plan.

4.   Learning outcome

During the course of the module students attended lectures regularly and prepared and presented their latest work every three weeks. An advisor from the university's technology transfer office was invited to give students feedback on their business plans. The following discussion presents the results of the questionnaire survey. The questionnaire was designed to evaluate the effectiveness of the exercise as a whole, and the collaborative development of the business plan in particular, within the context of learning about and for entrepreneurship. Learning outcomes identified in this paper focus on the knowledge and skills which students stated that they had acquired through participating in the business plan exercise. The questionnaire was distributed to the students at the end of the course. The students were able to decide whether they would like to participate in filling the questionnaire. The questionnaire received a good response rate with fifty-six per cent of the students on the course completing the questionnaire. Tables 2-5 summarize the findings relating to students' acquisition of knowledge and skills through their participation in the exercise.

Table 2. Students' acquisition of domain knowledge by percentage and rank

Domain Knowledge	Percentage	Rank
Business strategy	78.9	1.5
E-commerce Business models	78.9	1.5
E-commerce technology	63.2	3
Success and failure of e-commerce	57.9	4.5
Marketing	57.9	4.5
Digital market	36.8	6.5
Management	36.8	6.5
Knowledge Management	26.3	8
Value chain Management	21.1	9
Information management	15.8	10
Interface design	10.5	11.5
Project management	10.5	11.5

The data in Table 2 demonstrate that the three most valued areas of domain knowledge acquired through participating in the collaborative development of the business plan were: business strategy, e-commerce business models, and e-commerce technology. The need for sound business strategy and models is a recurring theme in the retrospective analysis of the dotcom boom and bust. Learning about 'success and failure of e-commerce' and 'marketing' were also considered to be important (57.9%). The value attributed by students as to the relevance of 'success and failure of e-commerce' is of particular note. The meaning of entrepreneurship traditionally incorporates the notion of risk and the risks attendant on entrepreneurship in relation to e-commerce enterprises are no exception.

Table 3. Students' acquisition of communication skills by percentage and rank

Communication skill	Percentage	Rank
Speaking effectively	94.7	1
Presenting and conveying ideas and information effectively	84.2	2
Writing concisely	68.4	3

Social competence is a key competence in order to participate effectively in the entrepreneurial process; and the data demonstrates how students ranked the acquisition of oral skills relating to speaking and presenting above those of writing skills.

Table 4. Students' acquisition of interpersonal skills by percentage and rank

Interpersonal skill	Percentage	Rank
Working effectively In a team	73.7	1
Listening to others	63.2	2
Being sensitive to others	57.9	3.5
Providing support For others	57.9	3.5
Developing rapport	52.6	5
Negotiating	47.4	6.5
Accepting criticism and acting upon it	47.4	6.5

Acquiring the ability to work effectively in a team is clearly an essential part of an entrepreneurial education and the findings demonstrate the clear value attached to this ability by the student body. The data also point to the other- rather self-oriented nature of enterprise development as part of a group dynamic. Listening skills, being sensitive to, providing support for, and developing rapport with others were also skills identified by the majority of students as being acquired. The students felt that listening skills and being sensitive to others are critical for working effectively in a culturally diverse team.

Table 5. Students' acquisition of organizational and management skills by percentage and rank

Organisational and management skill	Percentage	Rank
Decision-making	68.4	1.5
Accepting responsibility	68.4	1.5
Setting and meeting Deadlines	63.2	3
Managing time	57.9	4.5
Meeting goals	57.9	4.5
Planning and co-ordinating tasks	52.6	6
Attention to detail	36.8	7
Managing conflict	26.3	9
Enlisting help	26.3	9
Project management	26.3	9

Key skills identified by the students relate to the successful accomplishment and achievement of a collaborative exercise: decision-making (68.4%), accepting responsibility (68.4%) and setting and meeting deadlines (63.2%). The top ranking of these skills neatly highlights a logical sequence of decision-making, taking responsibility and achieving deliverables by a certain date.

Table 6. Students' acquisition of intellectual and research skills by percentage and rank

Intellectual and research skill	Percentage	Rank
Extracting, evaluating and organizing relevant information	57.9	1
Information locating, search and gathering	52.6	2
Creating ideas	47.4	3
Identifying and solving Problems	42.1	5
Applying critical judgment	42.1	5
Identifying relevant resources	42.1	5
Synthesizing data	36.8	7
Imagining alternatives	26.3	8
Initiating and recognizing information inquiry concisely i.e. what information	21.1	9

Of particular note in this aspect of the data set is the rating of information-related skills above those of the creation of ideas. Industrial and competitor analyses will have needed to have been carried out ahead of creating ideas for new enterprises.

6. Discussion

Domain specific knowledge acquired by the students is relevant to all stages of the entrepreneurial process: preparation, incubation, insight, evaluation, and elaboration. The emphasis placed by the students on acquiring knowledge of business strategy, e-commerce business models, e-commerce technology, and success and failure of e-commerce appears to bear this out. The healthy

ranking accorded to 'marketing' is also encouraging in that it demonstrates that a majority of the students were also following the entrepreneurial process right through to the stage of elaboration.

In regard to generic skills, the opportunity to and their ability to articulate and express ideas orally was highly valued. In the context of the entrepreneurial process this is again encouraging, where oral communication in teams, and presentations to external agencies forms a crucial part of effective entrepreneurship. Students acquisition of interpersonal skills bears out the importance of team-work in developing innovative processes. Students' acquisition of organizational and management skills appears to focus on group decision-making, a shared division of labour, and a number of process tasks related to keeping the task on track. There appears to be less emphasis on either asking for outside help and formal project management planning. The former may be encouraging in terms of group autonomy although the latter may be less encouraging. Interestingly, students acquisition of intellectual and research skills appears to have been concentrated on the preparation and evaluation stages of the entrepreneurial process. The higher ranking accorded to information-related skills above skills of creating ideas seems to suggest that many of the students were focused during the process particularly on researching the particular industry in which their case scenario was located and again evaluating their plan against real-world industrial cases.

7. Conclusion

In today's knowledge-driven business environment the ability to continuously innovate is regarded as a lynchpin of a company's competitive advantage. The survey results suggest that the business plan exercise has been an effective learning instrument through which students can acquire both domain knowledge and generic skills relevant to an innovative entrepreneurial process. Such a process of innovation, taken as a whole and in regard to the information-related and other creative and social skills that process incorporates is particularly pertinent to innovation in a knowledge-driven economy. How can this process and the skills which it incorporates be taught in the classroom? In this paper we have demonstrated that through a carefully designed exercise both domain knowledge and a set of

generic skills relevant to each stage of the entrepreneurial process can be developed. Teaching entrepreneurship can be not only about teaching students subject knowledge or knowledge about how to start and run a new business, but can also be about how to help and encourage students to develop their entrepreneurial capabilities e.g. identifying an opportunity, thinking creatively, communicating effectively. Learning entrepreneurship can then be a process of acquiring not only knowledge of business strategies and models and the application of these in organizational contexts but can also be about simulating intervention in the real-world through active participation in the collaborative development of business plans. We end with a caveat. Interested curriculum designers should ensure however that the design of such a learning environment is accompanied by a well structured learning process that supports and facilitates students' progress towards their business goal.

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