Enterprise Simulation & Experiential Learning (ESEL). Case study from Middlesex University.

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1 Introduction to the nature of the initiative and its objectives

The multi-award winning software lets people run their own virtual company and learn about entrepreneurship & business in an authentic, engaging and sustainable way. Working in simulated monthly cycles users make decisions in all areas of business and receive feedback to see the consequences of their actions (see figure 1).

Figure 1. Screenshot of simulation homepage.

Within the four key business areas (Organisation; Sales & Marketing; Finance; and Operations) any number of decisions can be made each month

(see figure 2). The challenge is to generate enquiries, sales and orders and build a successful company. Students are encouraged to think organically (rather than linear) and through this process they discover how subjects interconnect; rather than seeing them as standalone issues.
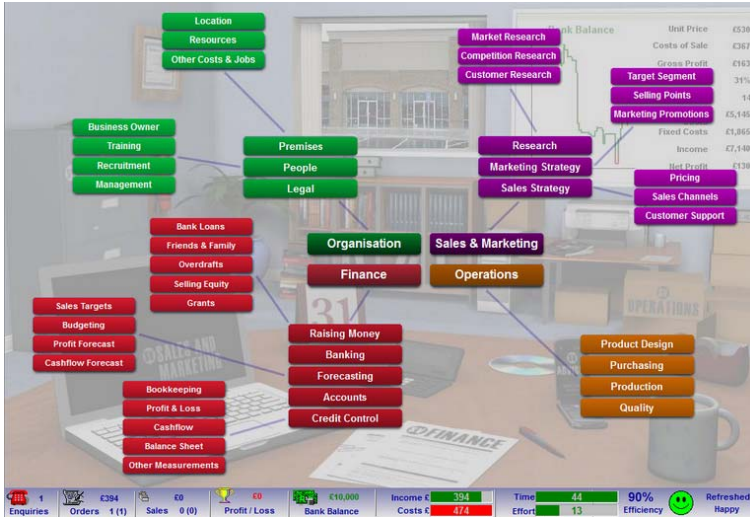

Figure 2. Screenshot of the four business areas.

Importantly, the software meets key criteria for effective learning by:

- putting learning in context so that students benefit from studying in an authentic environment where knowledge is applied meaning-fully.
- engaging students in their work motivating them to solve problems and find answers individually, collaboratively and within a wider so-cial community.
- facilitates the construction of mental models that simultaneously develop new perspectives.
- incorporating words, sounds and images as well as a flexible hands-on approach to learning, which appeals to all learning styles.
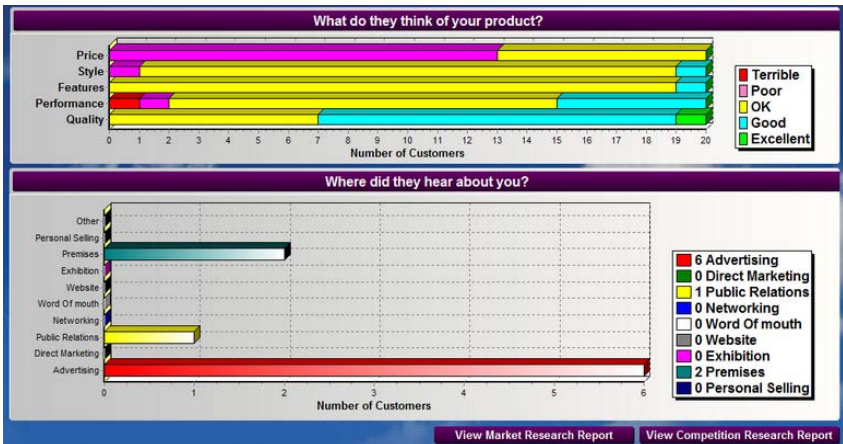
Figure 3. Screenshot of market research data.

Additional help is available from research reports (e.g. figure 3), tutor notes and video tutorials (e.g. figure 4).

Figure 4. Screenshot of additional help available on-line.

2   The infrastructure required to launch the initiative.

Licences are required for any organisation wishing to use the software. The license can be allocated to individual PCs. However, Middlesex University chose to adopt a network server license allowing up to 20 users to access the software from any PC in several different locations. The software was also 'white listed' so that university virus checks passed the installation.

The simulation download is a standard Windows install program from the internet requiring a password. This can be installed individually on each student's PC or onto a shared network drive and takes about 10 minutes. At Middlesex University the tutor chose to install on the network shared drive but with concurrent access allowing students to log on in more than one location. This meant that the tutor and students were not reliant on accessing the software in one location at one time.

The tutor was then able to book a computer lab suitable for n=20 PG students to use the simulation; with space to see the tutor's monitor projected via AV onto a large screen, and room to convene meetings away from the PC terminals.

3   The challenges that were encountered.

The first challenge was to persuade the university to purchase the software licenses. The options were to purchase licenses through central university software procurement; or via the business school. In fact, the business school approved the purchase though there were some protracted discussions between the business school and central software procurement which delayed the processing of the order. By the tutor communicating with the Head of Software Procurement directly this problem was eventually solved.

The next challenge was to engage students with the simulation. The tutor required considerable skill to persuade the entire class to attend the computer lab sessions when they had the burden of coursework to complete for other modules. Nevertheless, email communications, facebook group

messages, and presenting video clips of the software, with explanations from the tutor as to how the computer lab sessions would run, were all useful.

The next challenge was to design each session around specific learning outcomes. To do this the tutor needed to familiarise himself with the software, participate in a 1-1 training session with a more experienced user, and consider how best to make each session stimulating enough for the entire group of PG students as well as achieving the module learning outcomes.

The tutor thus asked the students to study 11 on-line video tutorials in advance to familiarise themselves with the software and how the simulation would run. Each session was then designed to build on the prior session so that students became familiar each week with different aspects of the software.

The progression of the sessions was as below:

1. Initial tutor presentation of the software home page and one video clip outlining how the simulation works.
2. Video clips and on-line tutorials for the students to view in their own time.
3. Introduction to each session outlining the learning outcomes for each session.
4. Setting of specific tasks for the students to undertake with the software prior to 'diving-in' to the monthly trading.
5. Running of the simulation with students in teams to introduce an element of competition.
6. Pauses of the simulation for feedback and de-briefing.
7. Awarding of prizes for the students achieving the highest profit.
8. Final de-brief and feedback from the students.

Christopher Moon

4   How the initiative was received by the participants.

The simulation software was piloted on a small group of MSc International Management & Innovation students. These PG students had a mix of prior academic and real world experience; with several of the students already running successful businesses. The tutor felt that this group would be sufficiently motivated to act as 'guinea pigs' for the running of the sessions; and also professional enough to provide meaningful evaluative feedback. N=16 PG students (male and female) provided evaluation comments as below (figures 5-12).
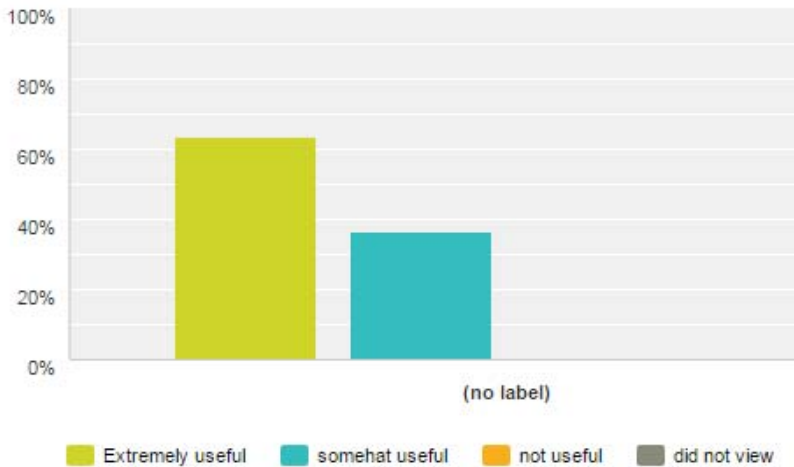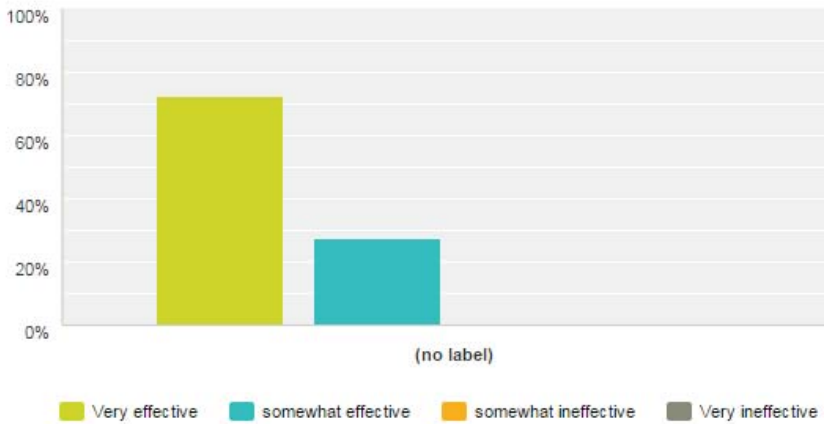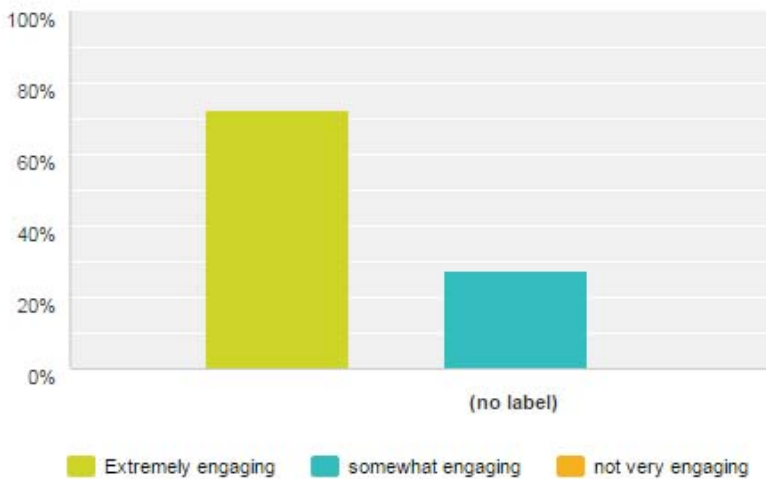

Figure 5. How useful did you find the walk through videos and tutorials in advance of the first session in the lab?
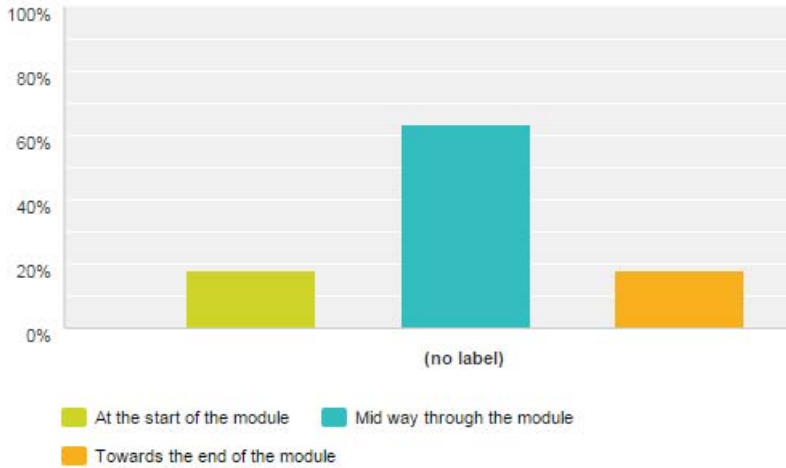
Figure 6. Is the simulation software an effective tool for learning about Venture Development?
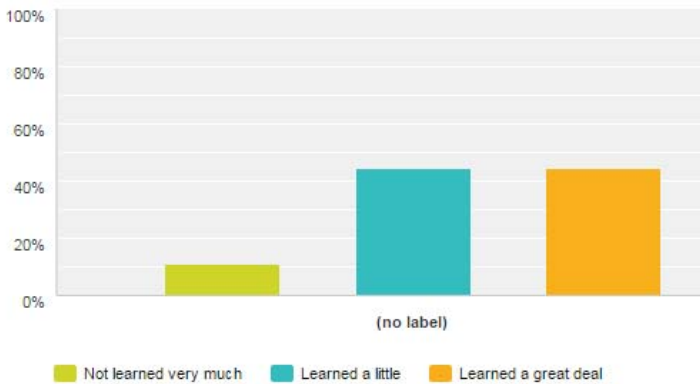

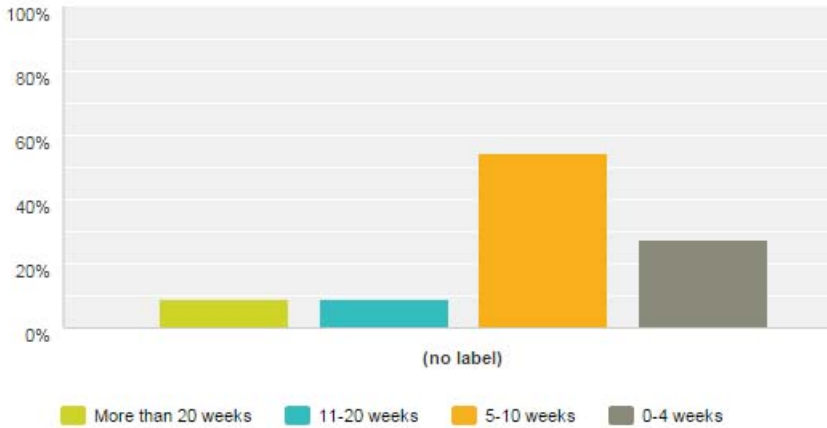**Figure 7. How engaging did you find the software simulation?**

Figure 8. Do you think that the simulation should be started earlier in the Venture Development module?
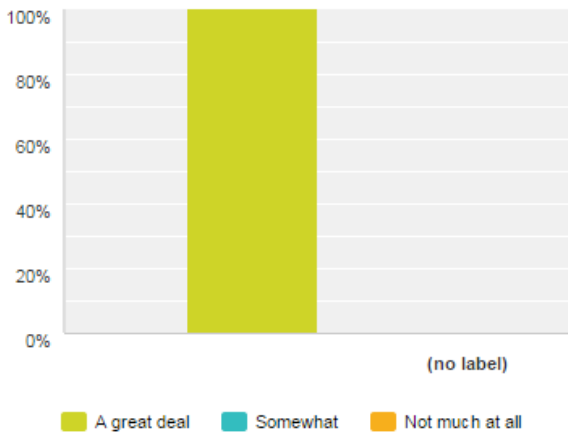

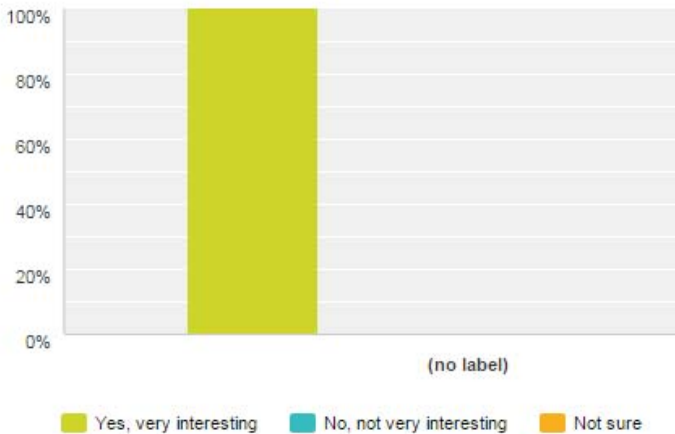**Figure 9. How much have you learned about running a business by using this software?**

Figure 10. How many weeks would you prefer to use the simulation for?

Figure 11. Did the tutor interact with the students to facilitate the simulation?

Figure 12. Did the tutor make the sessions interesting?

The above quantitative and anonymous feedback from the students is highly positive in general.

The tutor's opinion though is that some of the students did not view the on-line tutorials and video clips in advance and this meant they needed significantly more time to familiarise themselves with the simulation in class. Also, attendance for the sessions was sporadic with some students not able to attend every session due to work commitments, illness, the pressure of completing coursework for other modules, and the birth of a baby.

The feedback also needs to be interpreted in light of the student experience of the module as a whole; and of their programme as a whole. Students highly positive about the Venture Development module and about their MSc programme are likely to evaluate any such initiative in a positive light; and vice versa. However, the feedback was anonymous and should be considered valid.

The tutor also undertook three evaluations of the module in total: an interim evaluation of the module (Q1) to provide early feedback from stu-

dents (e.g. figures 13-16), evaluation of their use of the software simulation in particular as this was new to the module (figures 5-12), and an end of module evaluation (e.g. figures 17-20).

Results from the interim module evaluation (Q1).
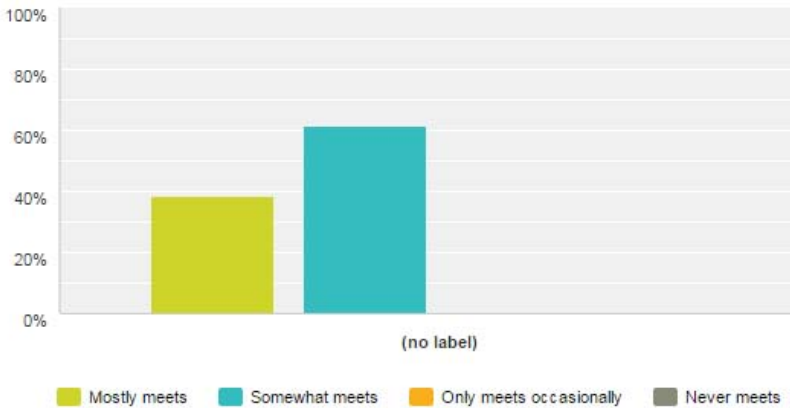
Figure 13. Does the module content match your expectations?
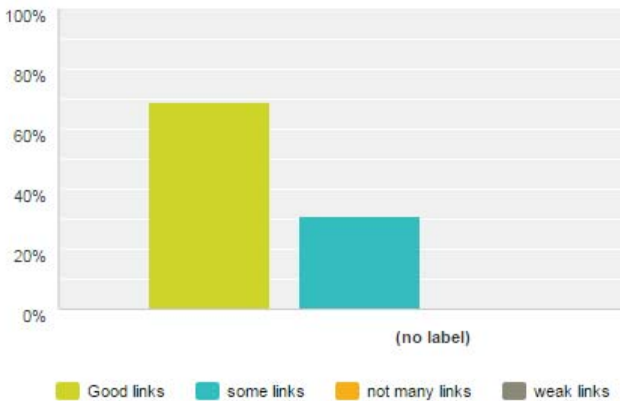
Figure 14. Does the module link with other modules?
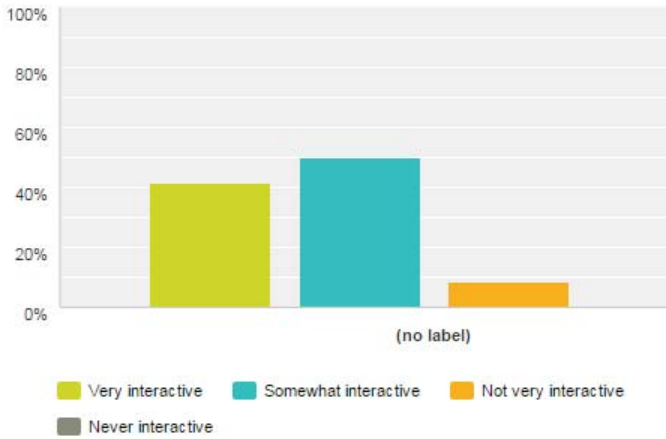
Figure 15. Are the sessions interactive?
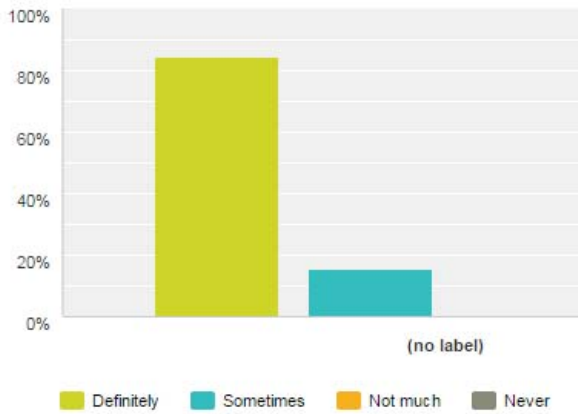
Figure 16. Were you able to put your learning into practice?

Results from the final module evaluation (Q4).
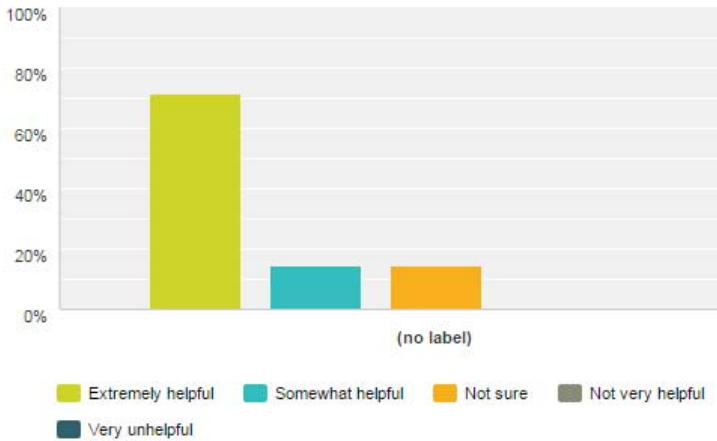
Figure 17. Has the Venture Development module been useful to developing your business start-up skills?
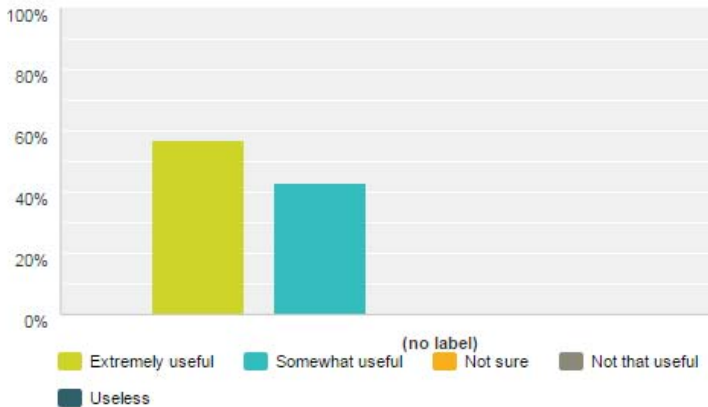
Figure 18. How useful did you find working on your business plan as part of the Venture Development module?
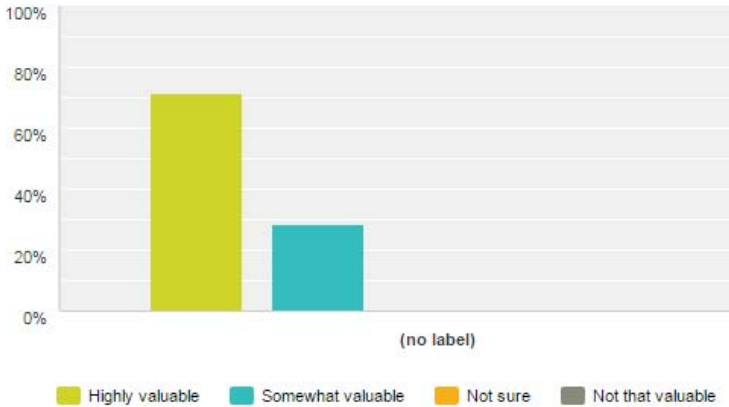
Figure 19. Did you value the tutors' mix of practical business experience and academic experience?
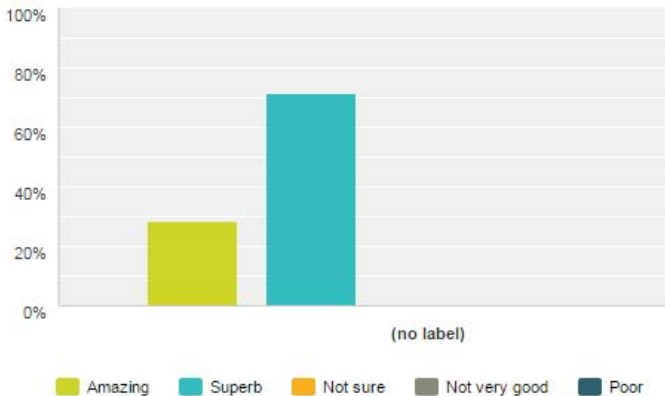
Figure 20. How would you rate the Venture Development Tutor?

The above results indicate that early expectations of the module were mixed with a majority indicating that the module content 'somewhat' matched their expectations. Other early signs were that the students felt

there were good links to other modules, and only a minority felt the module was not very interactive.

The end of module evaluation indicates that the majority of students felt the module had been useful to developing their start-up skills, the vast majority highly valued working on their business plans as part of the module, and the tutor was rated as highly valuable, amazing and superb.

The tutor concludes that the software simulation is just one tool in the learning resource toolbox. It is the ability of the tutor using their mix of both academic and practical experience that was instrumental in ensuring that the students were engaged in all the learning activities; and that learning outcomes for the module as a whole were met.

5   The learning outcomes that were achieved.

The learning outcomes for the module are cited as:

Knowledge

On completion of this module, the successful student will be able to:

1. Critically analyse the venture creation process; and learn how business ventures and small enterprises develop and grow.
2. Appraise functional areas in establishing and running a new venture and the role of the small business owner.
3. Evaluate various constraints which entrepreneurs and small business owners typically confront when implementing a new and growing venture during its formative stages.
4. Explore the wider socio-economic and policy context of business ventures and how they can be both a help and a hindrance to a new and growing venture.

Skills

This module will call for the successful student to:

1. Demonstrate a practical understanding of the steps involved in setting up and growing a viable business venture.
2. Evaluate both the enabling as well as constraining factors which affect business ventures in a variety of contexts.
3. Demonstrate competence in conducting effective research, underpinning enterprise development.
4. Present arguments, both verbally and written (and in alternative formats as agreed) in a coherent way.

The above learning objectives were achieved in a variety of ways. Assignments including a reflective essay, case study answers, and the presentation of business plans, all demonstrated the higher level of critical reasoning expected of Master's level students. However, it was in the experiential exercises that critical skills were specifically developed. In general these skills are difficult to assess in a formal way but the tutor would argue that LO's 5&6 above were indirectly evident in the way students interacted with the software simulation.

The challenge will be to formally 'assess' the students interaction with, and outputs from, the computer simulation. And the above feedback from the students indicates that they value links to other modules. Therefore, there is the opportunity to use the software simulation in an integrative way assessing common skills across a number of modules.

6   Plans to take the initiative forward

The results of this pilot clearly indicate that the software simulation has merit as a tool for students to learn about Venture Development and to learn critical skills of relevance to starting and growing a business. Preliminary findings from the student evaluations also indicate that the software simulation is not a replacement for other learning tools such as the use of case material, practical exercises and developing business plans.

The feedback from students specifically on the software simulation indicates that that they valued the engaging nature of the simulation, they thought the simulation should run for 5-10 weeks rather than the current 5

weeks, that the simulation should run mid-way through the module rather than at the end, the pre tutorials and videos were useful, and the role of the tutor is critical to the effective running of the sessions.

The tutor intends to discuss the feedback with the programme team and senior faculty. However, there is certainly enough evidence to warrant using the simulation with the next cohort of students on this module; with the above recommendations being implemented i.e. earlier start and longer run. What is not yet clear is how the simulation can be integrated with other modules; and how formal assessment could be introduced to evaluate the outputs of the student's learning.

Also, it is not clear whether the software could be introduced into an UG programme with much higher student numbers. Such simulations have been introduced in other universities; and there is some case material available on this.

However, each institution has its own particular issues in introducing such a change (validation regimes, departmental politics, programme design, programme leader support, sharing of assessments between modules, availability of appropriate technology and space, funds for further licensing, etc.).

Please see the appendix for conclusions and practical recommendations.

References

ABIS (2015). Experiential Learning. http://www.abis-global.org/projects/experiential-learning.

European Commission (2013). Entrepreneurship Education. A Guide for Educators. Entrepreneurship and Social Economy Unit, Directorate General for Enterprise and Industry, June. Entr-entrpreneurship@ec.europa.eu.

Moon, CJ (2014). Enterprise & entrepreneurship education: implications for innovation in delivery.9th European Conference on Innovation and Entrepreneurship (ECIE 2014) University of Ulster, Belfast, UK 18-19th September.

Appendix

The following notes are added to provide some conclusions and practical implications of use to readers

ABIS (2015) conclude that Experiential Learning is possibly one of the best educational approaches to allow for reflective practice and experience thus enabling managers and management students not only to thrive in an environment of complexity and ambiguity but foster long-term responsible leadership development. For a recent review of innovation in delivery see Moon (2014).

This pilot study has demonstrated the value of using software simulation for experiential learning in regard to Entrepreneurship Education. Preliminary evidence is that the students on this Master's programme in International Management & Innovation valued having the opportunity to engage with the software as part of their Venture Development module.

However, the results also show that the role of the tutor is critical (cf. EC, 2013) to ensure that students interact effectively with the software; and that 'preparation' aids familiarisation with the simulation in advance of running the software in class.

Recognition is also that such software is just one tool in the learning resource box; and should not be considered a replacement for other tried and tested techniques such as the use of case material, practical exercises and preparation of business plans. Further, the use of such a simulation needs to be considered in the context of its place in any particular module and any particular programme.

Further questions have been raised concerning how to evaluate student interactions with software simulation and of experiential learning in general. Student feedback provides some measure of general satisfaction; and with experienced PG entrepreneurs this feedback is invaluable. Nevertheless, the assessment conundrum of whether this type of engagement

should be subject to summative or formative assessment, and the form this should take, remains.

Recommendations

1. Allow six months to gain the necessary approval to upload software to the university network.
2. Carefully consider how to introduce the software; designing a pilot on a small group of highly motivated and committed students to provide valuable feedback.
3. Discuss the introduction of the software with faculty in order to gain support for any opportunities to use the simulation in an integrative way across modules.
4. Design the module to introduce the software mid-way through the module and lasting for 5-10 weeks. Any less than this, the students will not have sufficient time to engage with the software fully and reap all the benefits. Any more than this and the student's interest might start to wane.
5. The simulation allows students to 'dive in' and see what happens. There is some merit in this. However, the tutor recommends use of the 'driving lesson' approach which provides some boundaries for the students to work within. Thus, students have the opportunity to make mistakes in a simulated environment but still feel motivated to progress to the next level.
6. The role of the tutor is critical. The tutor should receive training in the use of the software, consult with colleagues that have introduced such simulations on other programmes, and familiarise themselves with the use of the software in detail.
7. The tutor should design the software simulation sessions to allow for progression of learning. That is, commence each session by reminding students of the learning objectives and proposed outcomes; and add new features to each session to ensure that the students feel they can progress with their learning over the entire course of sessions.

8. Ensure that student engagement with the software is evaluated including the practical application of their learning to their own level of entrepreneurial experience i.e. both new and existing entrepreneurs. Thus some of the features are particularly appropriate for starting-up a business and others are particularly appropriate for growing a business.
9. Further details of the software functionality are at
www.simventure.co.uk