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Impact of Business Simulation Games in Enterprise Education

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Abstract

This paper evaluates the impact of usage in teaching and learning of a business simulation game, SimVenture, on developing enterprise skills and attributes among undergraduate management students. The entrepreneurial learning outcomes set by National Council for Graduate Entrepreneurship are taken as a benchmark to assess the effect of SimVenture. The findings represent the preliminary results from the last two years. The paper examines student responses to the use of the game for learning. The paper provides an insight into how the use of SimVenture impacts on the students' perception of entrepreneurship alongside the development of their business skills. Overall, SimVenture is found to be a stimulating and engaging vehicle of teaching and learning. It allows students to play a role, not just read books, listen to lectures and analyse case-studies. A simulation forces students to synthesise and integrate what they read and make actual decisions based on facts or data presented in the case.

Keywords: enterprise, simulation, management, games

Introduction

As an educational tool, business simulation games have grown considerably in use since the mid 1950s and have moved from being a supplemental exercise in business courses to a central mode of business instruction. (A.J. Faria *et al.*, 2009)

Information technology has changed the way we live our lives. There is a growing body of evidence that students today have grown up in a media rich environment surrounded by video, consoles and computer games. According to a US based survey "by high school 77% of respondents had played computer games and over two-thirds (69%) had been playing video games since elementary school. By the time the current cohort of college students graduates, virtually all of them will have had some kind of experience with gaming" (Jones, 2003) The current generation of students (ages 18-22) tend to be experiential learners - they prefer to learn by doing, as opposed to learning by listening. In this respect games have many attributes of effective learning environment. Games include elements of urgency, complexity, learning by trial-and-error and scoring points. They also support active learning, experiential learning and problem-based learning. Games make it possible to use information in context and are inherently learner-centred and provide immediate feedback. Surveys show that students who use the games find that difficult tasks can be engaging, intriguing - and amusing - when incorporated into a story and a meaningful context.

While there is general agreement among experts that business simulation games deliver benefits to the learners when used appropriately, there is little understanding of the impact of the games on the learner's skills, behaviours and attitude. Scanning of the existing literature on use of simulation in enterprise/entrepreneurship education reveals that most of them are written by developers and evaluate predominantly the characteristics and features of the games without assessing the benefits to students.

This paper addresses the gap by evaluating the impact of usage in teaching and learning of a business simulation game SimVenture on developing enterprise skills and attributes among undergraduate management students. The entrepreneurial learning outcomes set by National Council for Graduate Entrepreneurship are taken as a benchmark to assess the effect of SimVenture.

The findings represent the early result over last two years. The paper examines student responses to the use of the game for learning. The paper provides an insight into how the use of SimVenture impacts on the students' perception of entrepreneurship alongside the development of their business skills. The paper considers the implications arising from the early results.

Promoting Learning through Business Simulation Games

The direct predecessors of the modern business simulation game can be dated back to 1932 in Europe and 1955 in North America (A.J. Faria, et al., 2009).

Following the development of business simulation games in North America, from mid 1950s the number of business simulation games in use grew rapidly. In 1961, it was estimated that more than 100 business games were in existence in the United States alone and had been used by more than 30,000 business executives and countless students (Kibbee, Craft, & Nanus, 1961 cited in A.J. Faria, et al., 2009). A survey conducted in 1995 (A. J. Faria & Nulsen, 1996) suggested that 97,5% of all member schools of Association to Advance Collegiate Schools of Business (AACSB) were using at least one simulation game. In the UK, according to Burgess (Burgess, 1991), 92% of business and managements departments of former polytechnics and nearly 50% of the universities were using some forms of simulation games in their curriculum. Unfortunately there is no information to assess the most recent usage of business simulation games. However it might be reasonable to anticipate even greater and more complex use of the simulation games in business and management education due to the advances in gaming industry itself. The key milestones in the recent history of the business simulation games are presented in

Table 1.

Table 1 Phases in the Development of Business Gaming

Phase	Period	Developments
I	1955 to 1963	Creation and growth of hand-scored games
II	1962 to 1968	Creation of mainframe business games and growth of commercially published games
III	1966 to 1985	Period of fastest growth of mainframe games and significant growth in business game complexity
IV	1984 to 2000	Growth of PC-based games and development of decision making aides to accompany business games
V	1998 to present	The growth of business game availability on the Internet and run through central servers (e.g., CAPSIM and the CAPSTONE series of business games and INNOVATIVE LEARNING SOLUTIONS and the MARKETPLACE simulations)

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The changes of business practices shapes the demand of the labour market requiring students to learn from experiential education such as internships, business plan competitions and business simulations among other educational techniques (Summers, 2004). Therefore, the success of business games in most recent year can be attributed to the extent in which they address the shifting focus of educational process toward experiential learning, development of decision making skills, promoting teamwork, motivating students, applying theory in a practical fashion, involving students (active learning).

“As vehicles for instruction, business simulations remain as powerful today as they were when first introduced. They allow for dynamic business decision making where players formulate a strategy and then carry out a series of decisions to implement the strategy. Game participants receive feedback that demonstrates the consequences

of their decisions, and the participants are able to evaluate their strategies and, if necessary, reformulate their strategies. The experience gained from the repeated iterations of decision periods provides direct feedback to players, from which they are able to learn". (A.J. Faria, et al., 2009 p. 480)

The use of business simulation games also followed the shifts from the traditional teaching- and learning paradigm where the learning process was viewed fundamentally in terms of information transfer to more experiential learning which occurs through transformation of experience, when a learner is actively engaged in some kind of practice (Clarke, 2009; Lainema & Makkonen, 2003; Thatcher, 1990). Business games generate a dynamic environment which presents a series of decision-making activities. Every cycle creates a new situation with a new problem to solve or decision to make. Simulations not only construct nearly "real world" experience but also help to bring theory and practice together by developing an ability to use acquired knowledge/skills appropriately (Ruben, 1999 p. 499). Business simulations recreate a Kolb's experiential learning model where a business game generates a series of micro-experiences followed by instant feedback and reflection and the application of the reflective to a new situation as the game develops (Thatcher, 1990). On a practical level there are strong evidences to support business games as a valid learning methodology (Washbush & Gosen, 2001; Wood *et al.*, 2009).

Nowadays business simulation games are used to teach a broad range of business and management disciplines such as strategic management, marketing, project management, economics, and international business. Ironically despite the "unprecedented growth" (Solomon *et al.*, 1994) of entrepreneurship education after the WWII period and a wide recognition of the value of experiential learning for entrepreneurship education, relatively few simulations are available for this purpose (Wolfe & Bruton, 1994). The real-life focus and experiential learning have been at the core of entrepreneurship education since its origin in business schools (Hindle, 2002; Katz *et al.*, 1994; Solomon, *et al.*, 1994). It would appear that business simulation games can be advantageous as pedagogical instruments. A good business game can be complex and comprehensive as well as flexible where an instructor can set the pace, complexity and pedagogical focus of the simulation (Thavikulwat, 1995).

SimVenture - an overview

SimVenture is Windows-based software that was launched in October 2006. According to the company at present over 100 UK Higher Education institutions use the game in their curriculum. The philosophy behind SimVenture is helping young people to develop their business, enterprise and entrepreneurial thinking engaging minds and making learning enjoyable, personal and meaningful.

The business simulation operates much like a perceived 'leisure time' game. It requires users, working as individuals or teams, to make decisions and deal with consequences in a simple to understand and coherent manner. The game has multiple difficulty levels which ensure that students are continuously challenged at a level which suits their ability. This depth of problem solving combined with the richness of information contained within SimVenture means students must deal with a breadth of issues but can monitor and evaluate their own progress at all times. Importantly, SimVenture has a 'save and load' function and report printing is straightforward.



Figure 1 SimVenture "Office"

Authenticity, challenge and engagement are at the heart of everything SimVenture offers students. By mirroring reality closely and making appropriate demands on learners, the software does not patronise, but instead seeks to embed analytical wisdom and foster the development of practical skills that can be applied both in and outside the class.

Critically, the software allows teachers to facilitate learning. This means they have time to stand back from their traditional role and support and guide where necessary. At the same time students have much greater control over what they are learning and are thus more motivated and responsible for their work. By creating this dynamic, students are able to understand, through experiential learning, what previously may have seemed complex and unreachable theoretical content. Such understanding makes for successful learning, builds self-confidence in students' ability and allows people to contribute and share thinking when discussing how they ran their own virtual company. The Figure 2 shows the screenshot of overview of business activities for a month.

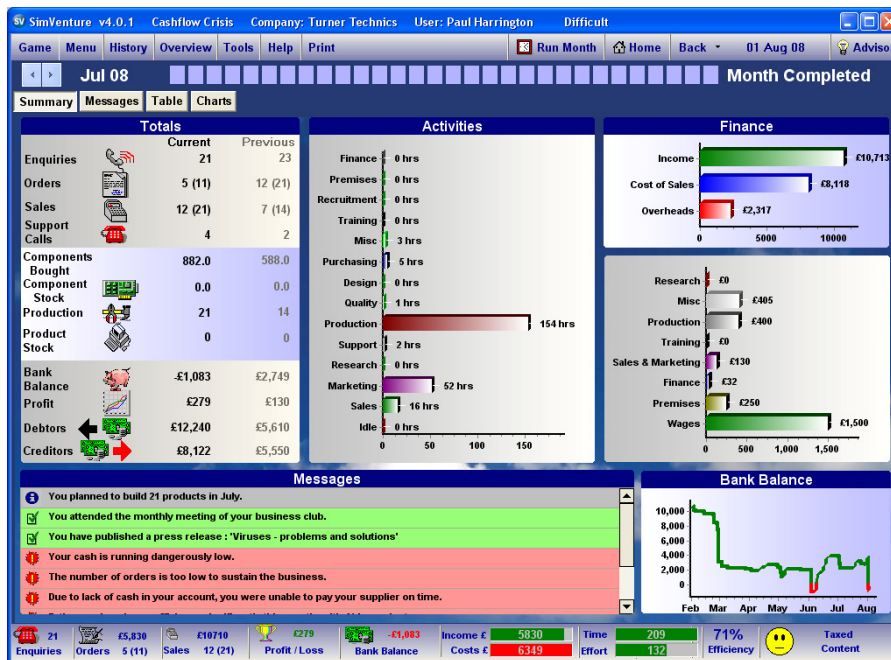


Figure 2 Business Activities Overview in SimVenture

Features of SimVenture

The simulation covers all main business areas such as marketing and sales, organisation, finance, and operations. Business areas within the game:

- Marketing and Sale (Market Research & Target Markets, Competitor Research, Customer Feedback, Pricing, Sales Channels, Sales Promotions)
- Operations (Product Design, Purchasing, Production, Quality Control)
- Finance (Banking, Accounts, Credit Control, Fund Raising Strategies, Financial Analysis tools)
- Organisation (Location, Resources, Legal requirements, Recruitment, Training, Time Management, Efficiency)

SimVenture is a flexible teaching and learning tool providing different level of difficulty, allowing to set starting conditions (amount of start-up capital, for example). To make game even more realistic SimVenture is equipped with unexpected events option. Every new game generate variable and dynamic data, no games are the same. In addition to initial Start-up game, the simulation has several built-in scenarios to illustrate a specific business problem such as cash-flow crisis, business growth pain, etc. An experienced instructor can also generate own scenarios tailored to a specific discussion topics. The latest version of SimVenture allows a greater degree of customisation for instructors. This facility allows an instructor to link own web or Windows-based content to pages within SimVenture such as documents, video, audio and web-links to inform, support and enhance the user's experience of the software. In addition, a new function 'Tutor Events' allows the tutor to provide information, give instructions or request feedback from users at pre-defined times.

Teaching and Learning Activities

SimVenture has been used in conjunction with other pedagogies to deliver the Planning and Entrepreneurial Skills module for second year undergraduate students. The aim of the module is to instil in each student the belief that upon completion of the class that they possess a foundation of skills and knowledge that will enable them to effectively evaluate

new venture opportunities and increase their odds of successfully starting a business. Among others the objectives set to achieve by using SimVenture are

- Identify and determine the driving forces in a new venture.
- Evaluate and determine how successful entrepreneurs and investors create and build value for themselves and others.
- Determine the critical tasks to be accomplished, the hurdles to be overcome during start-up and early growth, and what has to happen to succeed.
- Apply the opportunity screening criteria to actual start-up ideas, and subsequently develop a feasibility report and presentation suitable to present to investors and industry participants.

The module was delivered over twenty-four weeks (two terms); the delivery was organised in two-hour seminars. Overall 37 students were enrolled to the module. During first terms students were exposed to different concepts of entrepreneurship and had to accomplish a range of tasks including interview with an entrepreneur, research of support for SMEs in the UK and opportunity evaluation exercises. In the second term they were introduced to SimVenture. First, a two-hour seminar was assigned for introduction of the game and to run a "Driving Lesson" scenario allowing students to familiarise with the software. Subsequent seminars were alternated between discussing analytical tools and practicing them using SimVenture. Initially, all activities were limited by use of Driving Lesson as this scenario would provide uniform market and competitive conditions for all players. When a degree of familiarity was achieved students started running their own games. The starting capital was set to £10,000 (default for the software which could be altered) and played at an Easy level. The "Random Events" generator was turned off. The game was played in teams of three-four; the students were given an advice to delegate functional responsibilities within the teams. In reality, in most groups decisions were taken together. However, in some groups nobody would take responsibility for decision-making process and those groups struggled with the game blaming the software. On its own this was an interesting observation relating to group dynamics worth further investigation.

Throughout the game students required to keep a log where they had to have to record what decisions were made and how and why these decisions were made. At the end of the game every team made a presentation focused on how a team performed as a group and what individuals learnt about themselves. The presentation should outline the original business strategy and how, if any, it evolved through the course of the game.

The game contributed towards forty percent of the overall module mark where the performance of the game as such constituted only ten percent (the feedback sheet outlining the criteria for assessment is included in appendix 1).

Results and Discussion: Did SimVenture Have Impact on Students?

As a part of impact assessment a questionnaire was developed based on National Council for Graduate Entrepreneurship entrepreneurial outcomes and then distributed to the students at the beginning and the end of the academic year. The initial results indicate a significant impact on the development of entrepreneurial skills (see Figure 3 and Table 2).

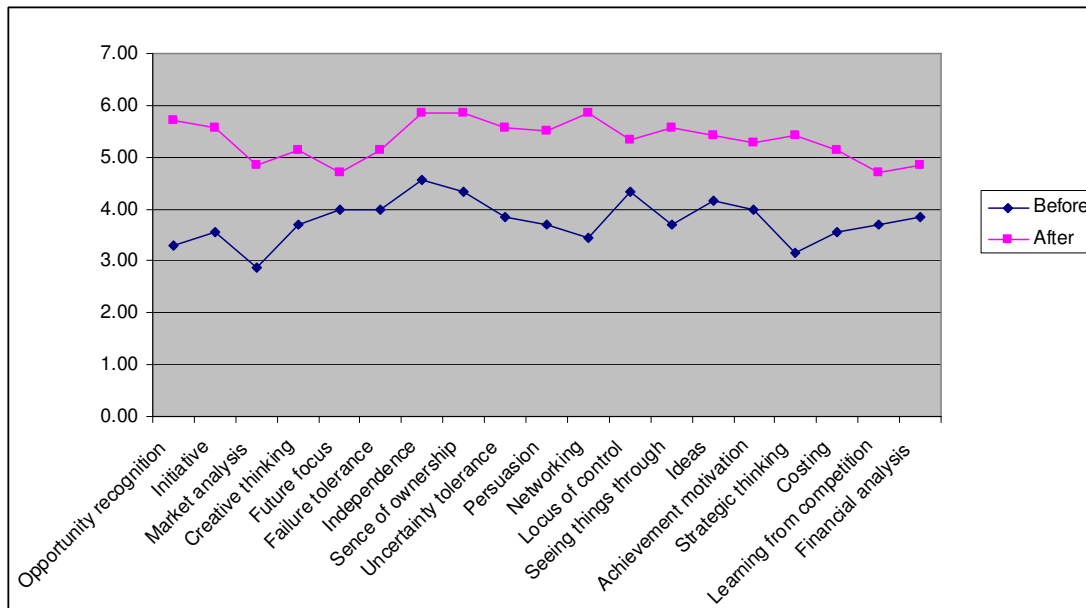


Figure 3 Impact of the module on Entrepreneurial Outcomes

Table 2 Impact of the module on Entrepreneurial Outcomes (in order of significance)

	Mean before	Mean after	Standard deviation	t-test
It easy for me to see a problem as an opportunity	3.286	5.714	1.912	0.002
I have a strong desire to see things through	3.714	5.571	1.781	0.004
I have a strong orientation to achieve	4	5.286	1.393	0.004
I use social networks for career advantage	3.429	5.857	1.692	0.005
I am an optimist, failure doesn't discourage me	4	5.143	1.016	0.005
I have a strong sense of independence	4.571	5.857	1.311	0.012
I am good at analysing market data	2.857	4.857	1.748	0.013
I can set an appropriate business strategy and manage it	3.143	5.429	1.816	0.015
I am capable to make judgments based on limited information	3.857	5.571	1.49	0.023
I have a strong sense of ownership (of events and actions)	4.333	5.857	1.345	0.025
I am able to take an initiative	3.571	5.571	1.869	0.027
I always have lots of ideas	4.167	5.429	1.573	0.03
I am good at persuading others in my ideas	3.714	5.5	1.808	0.034

I am able to assess financial needs of the business and finance the business appropriately	3.857	4.857	1.499	0.038
I know that I am in full control of my own destiny	4.333	5.333	1.267	0.041
I am good at thinking creatively	3.714	5.143	1.651	0.058
I am able to price a product/service	3.571	5.143	1.737	0.072
I am able to appraise and learn from competitions	3.714	4.714	1.369	0.086
I am forward looking	4	4.714	1.393	0.182

The questionnaire included a mixture of attribute/behaviour and skill related questions. Based on evaluation of literature and the software itself it was reasonable to assume that SimVenture would contribute to the development of business skills such as planning, market analysis, pricing, etc. The results suggest that overall SimVenture did have an impact both on skill level and attribute level as well. More over it appears that the module contributed significantly to students' personal development, their ability to see problems as opportunities, see things through, desire to achieve, and optimistic tendencies. With very few exceptions most of the indicators demonstrated significant differences. At the same time students did not feel that they are able to think more creatively and look forward. Surprisingly pricing the product as well as learning from competition did not appear to have any significant differences. This should be taken into account in future lesson plans.

In addition to the quantitative survey, students were required to keep a reflective journal to record their experiences and lessons learnt. Here are some students' comments on their experience with SimVenture:

SimVenture has changed my ideas and views on small business ... The (initial) complication soon shifted to complexity and I was pleasantly surprised by the logical construction and intricate capabilities of SimVenture and how well it related to real life business situations. The overwhelming feeling I have taken away regarding running a small business is that it takes patience, hard work, planning and incredible organisational skills.

(Class 2008-2009)

I found it was really challenging playing this simulation game as you have to make serious decisions which determine the success or failure of the business and it absorbs you in a very high authentic world of business. At times I was stressed and frustrated because things did not work in the way I/we wanted to be e.g. when we incurred loss and falling into massive debt it was really a stressful situation as we couldn't manage to bring business back to its effectiveness apart from modifying different simulation. ... I have learned that lack of enthusiasm, determination and motivation lead to an unsuccessful outcome, so next time if I'm going to do something like this I'll make sure I put all my efforts and focus into it. This simulation is a fun and an excellent way to learn how to start your own business and understand different aspects of the business before investing in real business.

(Class 2009-2010)

What I found difficult with this task (SimVenture) was liaising with four people in total on every decision as this was time consuming and two members of the group were very indecisive with let to M and myself making most of the business decisions. Which poses the question, would business decisions be more difficult in reality if there were too many cooks in the kitchen? I believe so, this particular task has therefore force me to carefully consider who I go into business with.

(Class 2009-2010)

There were no comments on how SimVenture impact the development of the hard business skills however the students' reflected mainly on understanding and appreciation of business, the attitudes required for running the business and the role of team work. Hence the qualitative data confirm that SimVenture had an impact on the soft skills such as team work for example.

Limitations and future research

This paper presents only initial results and does not claim to produce ultimate findings. The issues which could be questionable is the objectivity of the responses to the questionnaire, in other words, do students give a realistic assessment or "expected" outcomes especially when it concern end of the module questionnaire. The intention is to collect data over longer period (2-3 years) which provide a bigger sample.

As it was mentioned earlier in first term students were exposed to other active learning pedagogies. The failure to include mid-year questionnaire made it difficult to separate impact of SimVenture. However when students were asked to assess which tasks had a greater impact, the response was unanimous: SimVenture.

The quality of qualitative data is very much dependant of individual students to provide a meaningful account of their learning experiences. Accumulated experience and existing reflective comments could be used in the future to guide students to produce better reflections which could be used for future research.

Overall, SimVenture is found to be a stimulating and engaging vehicle of teaching and learning. It allows students to play a role, not just read books, listen to lectures and analyse case-studies. Simulations generate much more energy among students than traditional lectures or case discussions. Students make decisions and see the results of their decisions in the outcome of the game; they can explore the impact of multiple decisions at the same time. Simulations also allow students to validate their common sense relative to a particular situation. A simulation forces students to synthesise and integrate what they read and make actual decisions based on facts or data presented in the case. Simulations give students a temporal dimension, an opportunity to experience outcomes that change based on their inputs over time.

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Appendix 1

Assignment Feedback Sheet

MODULE Planning and Entrepreneurial Skills Code BIS0004

ASSIGNMENT SimVenture

STUDENT NAMES _____

Tutor Dr. D. Williams

Comments and feedback

Criteria	Comments	Mark
Company performance (profit/turnover/conversion rate) (10%)		
Justification of target market (20%)		
Justification and evaluation of product design with reference to competition and customer feedback (20%)		
Justification and evaluation of promotion strategy (20%)		
Justification and evaluation of logistics and supply (10%)		
Timing of setting up limited company 10%		
Other (recruitment, finance, resources, etc) 10%		

Additional Comments

Assigned Mark