Strategic management simulation as a blended learning dimension: Campus based students' perspectives

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Although business simulations are widely used in management education, there is no consensus about how to optimise their application. Our research explores the use of business simulations as a dimension of a blended learning pedagogic approach for undergraduate business education. Accepting that few best-practice prescriptive models for the design and implementation of simulations in this context have been presented, and that there is little empirical evidence for the claims made by proponents of such models, we address the lacuna by considering business student perspectives on the use of simulations. We then intersect available data with espoused positive outcomes made by the authors of a prescriptive model. We find the model to be essentially robust and offer evidence to support this position. In so doing we provide one of the few empirically based studies to support claims made by proponents of simulations in business education. The research should prove valuable for those with an academic interest in the use of simulations, either as a blended learning dimension or as a stand-alone business education activity. Further, the findings contribute to the academic debate surrounding the use and efficacy of simulation-based training [SBT] within business and management education.

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1 Introduction

Within the academic literature there is robust debate on the use of simulations as a blended learning dimension. However, few best-practice prescriptive models for the design and implementation of business simulations in this context are presented. Furthermore, there is little empirical evidence for the claims made by such models (Mitchell, 2004; Borner *et al.*, 2012). Our research compares undergraduate business student perspectives with claims made by proponents of one best-practice model presented in the academic business education literature.

Our study first reviews the literature on blended learning within higher education business education. Second, we explore simulations as a dimension of blended learning. We then conclude the literature review by outlining the seven-stage prescriptive model (Salas et al 2009) that has been chosen for evaluation and validation.

The study then outlines methodology and methods designed and used in the described case example. This is followed by a discussion of the results (outcomes) and findings of student responses to a survey on key aspects of a blended learning delivery that incorporated a substantial business simulation.

The study concludes with a review of the outcomes and student observations, in relation to the *Salas et al.* (2009) seven-point model. We argue that the model, when implemented as prescribed, results in the expected outcomes as stated by the authors of the model. Suggestions are made for further work which is to be undertaken to validate and develop best practice models for simulation based training [SBT] in blended learning progammes.

2 Literature review

2.1 Blended learning

In recent years ‘blended learning’ as both a term and pedagogical approach has gained significant currency within the Higher Education (HE) sector. In simple terms, blended learning can be considered as a combination of technology enhanced and face-to-face learning (Bonk & Graham, 2006). However, it is the effective integration of this face-to-face and technology enhanced learning that will facilitate active learner engagement and foster ‘deep learning’, a state from which positive outcomes for students can be observed (Singh, 2003; Biggs & Tang, 2007; Kanuka, 2003; Bonk & Graham, 2006).

Blended learning has not been without its critics. Some authors (e.g. Shepherd, 2006) argue that blended learning is nothing more than a marketing buzzword for a repackaged product that adds little that is new. Others argue that the term 'blended learning' is erroneous: learning is rarely a result of 'blend' and that what is really being addressed is delivery of teaching, implying that the term 'blended learning' needs to be reconsidered (Oliver & Trigwell, 2005). Further arguments contest that the use of such pedagogical approaches may be more influenced by the external political environment and economic imperatives than enhancing the learning experience (Carr, 2005). Indeed, it has been argued that many adult learners returning to education may have 'phobia' relationships with computers and/ or lack the technical skills required to fully engage with blended learning approaches (Saade & Kira, 2009).

Such critiques, however, do not address the underlying arguments by proponents of blended learning approaches that, despite issues with definition and originality, blended learning has been found to have a wide and varied range of benefits – for learners and for institutions – beyond enhanced engagement and 'deep learning' experiences. Furthermore, with supported delivery methods, issues related to technological know-how can be overcome.

In the institutional context it has been argued that blended learning provides a cost effective way of enhancing under-enrolled programmes that allows for more flexibility in scheduling whilst retaining face-to-face learning and improved management of teaching loads. Furthermore it has been argued that blended learning approaches help meet contemporary student expectations, leading to a move toward more active learning and student-centred pedagogical strategies (Lorenzetti, 2011; Graham et al, 2005; Lloyd-Smith, 2010).

For learners, discourse facilitated through asynchronous web-based tools as part of a blended programme can be more reflective and objective than that in a face-to-face forum. Increased engagement, a more diverse learning experience and, importantly, more breadth and depth of learning have also been espoused as benefits of a blended learning approach. Flexibility for students to balance jobs, families and other commitments with study opportunities; particularly in the context of 'non-traditional' students has also been noted as a benefit (Garrison, 2004; DeLacey & Leonard, 2002; Lloyd-Smith, 2010).

In spite of the debate about the merits and demerits of the term blended learning and blended learning pedagogies, it has been argued that in the ever-changing context of technological innovation, higher education institutions must address the concurrent change in student expectations (Garrison & Vaughan, 2008). The need to reduce the cost of education, whilst increasing education provision to a growing customer base, has become an

increasing pressure on higher education institutions. It has been argued that it is these factors that have lead to an adoption of the blended learning approach across the HE sector (Garrison & Vaughan, 2008; Carr, 2005).
Traditionally blended learning has been distinguished from enhanced classroom, or purely online, provision through the linkage between traditional classroom activities and web-based e-learning activities (Garrison, 2004; Oliver & Trigwell, 2005). However, it is argued that this position takes too narrow a view because blended learning encompasses a more diverse range of dimensions (Singh, 2003; Oliver & Trigwell, 2005). Therefore in order to promote enhanced learning, blended approaches should combine differing dimensions of delivery media in order that each is complimentary to the other (Singh, 2003).

Much discussion on these dimensions can be found in the literature, differentiating between synchronous, asynchronous, physical and online formats along with support mechanisms such as documentation availability and technical support (Singh, 2003; Rossett *et al*, 2002). Singh (2003) provides a useful illustration (table 1) that outlines different types of learning formats:

Table 1: Learning Approaches and Choices (Singh, 2003)

Synchronous physical formats	Instructor-led Classrooms & Lectures Hands-on Labs & Workshops Field Trips
Synchronous online formats (live e-learning)	Online Meetings Virtual Classrooms Web Seminars and Broadcasts Coaching Instant Messaging Conference Calls
Self-paced, asynchronous formats	Documents & Web Pages Web/Computer Based Training Modules Assessments/Tests & Surveys Simulations Job Aids & Electronic Performance Support Systems (EPSS) Recorded Live Events Online Learning Communities and Discussion Forums Distributed and Mobile Learning

2.2 Simulations

In more recent times, computerized or online simulations have been identified as a blended learning dimension that can be utilised as an integrated tool to enhance learner engagement and understanding (Bonk *et al*, 2006; Singh, 2003). The main aims of any simulation are to, 'imitate a system, entity or process' (Lean *et al.*, 2006, p228).

Modern business simulations can trace their roots to the 1960s when experiential learning as a pedagogical approach began to be accepted as a tool for addressing the limitations of more traditional teaching approaches (Keys & Wolfe, 1990; Lean *et al*, 2006; Gredler, 2004). Certainly, the use of simulations throughout the HE sector as part of business education programmes has increased dramatically in recent times (Faria & Nulsen, 1996; Avramenko, 2012) and interest in exploiting the educational benefits of online simulations continues to increase (Wideman *et al.*, 2007).

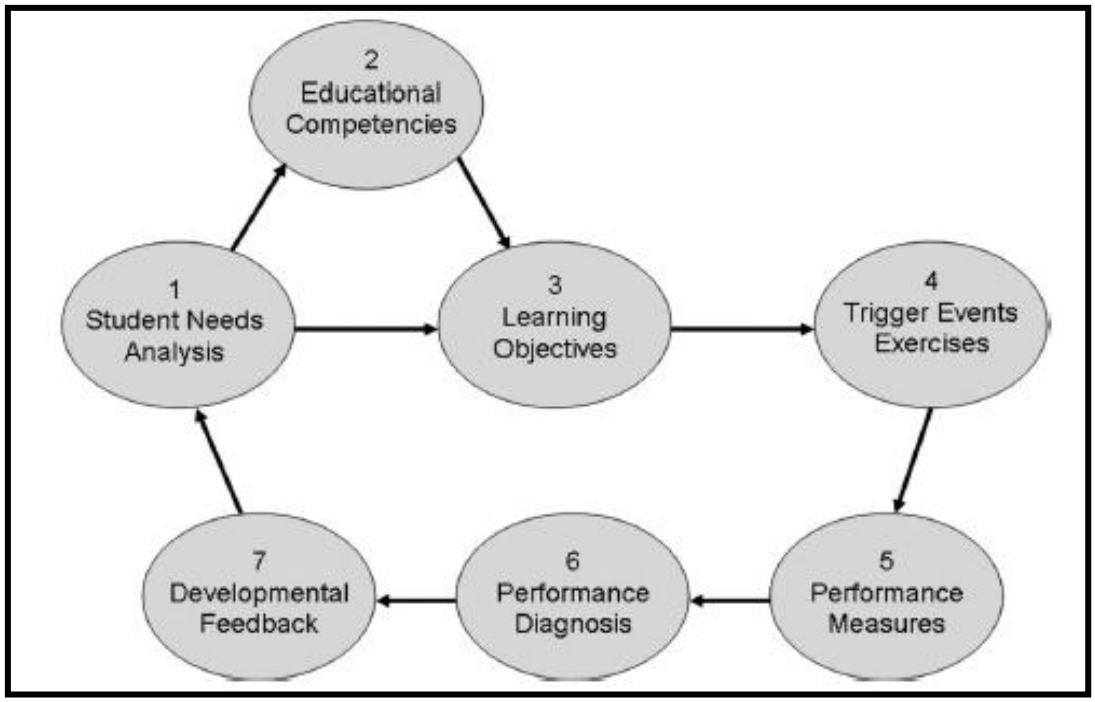
Within the academic literature there can be seen to be robust debate surrounding the use of simulations in the business education context. Van Ments (1999) argues that simplifications that are misleading, or trivial factual errors that could be made, may negatively influence the outcome of a simulation. Van Ments further argues that the amount of resources required to run a simulation may be restrictive, in terms of time and professional staff required. Mitchell (2004) contests that simulation, when compared to case study activities, has no inherent superiority and cannot be considered a panacea. Mitchell also reports that no difference in performance against learning outcomes was noted in a student group studied.

Yet current management education literature can be seen to be positively aligned with the use of such tools and the espoused virtues are impressive. For learners these include the advantages of experiential learning and practical experience in addition to an academic education, enhancing the development of management skills, producing more effective managers, provision of complex and realistic learning environments, provision of a risk-free, experimentation-friendly environment, increase in dynamic knowledge, inherent engagement of learners (and related 'deep learning') and the enablement of learner controlled study (Salas *et al.*; 2009, Feinstein, 2001; Keys & Wolfe, 1990).

2.3 The seven stage model

Whilst the majority of simulation-based learning literature critiques and adds to academic understanding, the content tends to be descriptive in nature. As such, the available literature offers few models for the design and implementation of simulations that would aid facilitators to realize the benefits often espoused by proponents of their use (Lean et al, 2006; Salas *et al.*, 2009). In order to address this lacuna, Salas *et al.* (2009) propose a seven step framework for the implementation of simulation-based learning. As the authors do not state otherwise, an assumption is made in this paper that the framework is equally valid when used as a component of a module or as a stand-alone exercise.

Figure 1: Stages for the Successful Implementation of SBT in Management Education (Salas et al, 2009, p565)



Student needs analysis entails gaining an understanding of what knowledge and skills the learners possess and what needs to be delivered in training. This stage is likely to correlate to the course or module being taught within business education.

The ***educational competencies*** stage requires the development of a clear understanding of what the simulation will deliver in terms of the change in knowledge, skill or attitude that should occur as a result. The outcomes are more general goals and, in the undergraduate education context, will likely correspond with the overall programme goals/ objectives.

The third stage, ***learning objectives***, requires development of specific, measurable training objectives that can either be task-specific or task-generic. These objectives should be as specific as possible, directly address those competencies that have been specified in the needs analysis and clearly outline the requirements for satisfactory performance.

The next stage, ***trigger events exercises***, relates to a simulation being chosen that allows for students to demonstrate the competencies required and developed throughout the first three stages of the process. In the business education context, this will likely involve selecting the business simulation that is most appropriate.

The fifth stage, ***performance measures***, involves embedding a performance measurement process that is objective, measurable and allows for quality feedback to students.

The ***performance diagnosis*** stage requires that the measures chosen be used to gather data. This data can then be used to compare against the desired outcomes developed in the first three stages of the process. It is also argued that the performance measures outlined in the previous step should measure both the outcomes and the processes within the training. This, in turn, will allow for the causes of performance to be related to the outcomes at this stage.

Developmental feedback is the final stage of the process. It requires that feedback be given to students throughout the simulation process. In turn this allows for adjustment of strategies and improvement of competencies.

It is argued that successful implementation following the prescriptive model outlined will result in specific behavioural competences:

1) Effective problem solving
2) Entrepreneurship
3) Leadership

Behavioural competences are expected outcomes of the prescriptive model as a value of SBT is that it allows students to apply and practice retained knowledge, not only in improving skills but also in inculcating desired behaviours (Salas *et al.,* 2009). However, the available literature lacks empirical evidence that either support or refute the outcomes that Salas *et al.* (2009) propose.

3 Model, methodology and methods

This study employs the conceptual model developed by Salas *et al.* (2009) as the backdrop to a case study evaluation of a strategic management module, delivered in the 2011/12 academic year. The case study method is used to assess the robustness of the model in assessing if it "fits" a typical undergraduate strategic management module using a computer-based simulation. The data used to evaluate the conceptual model developed by Salas *et al.* (2009) and its effectiveness is collected from two sources; the tutors and students, respectively. The tutors' views are essential and critical in assessing the robustness of the model as they have developed the module in accordance with governmental and university regulations, industry and student expectations, and the mechanics of the proprietary computer-based simulation. Source data on the student perspective were collected via a mixed methods approach (Johnson *et al.*, 2007) that involved a questionnaire survey, in-depth semi-structured interviews and written student reflections.

The questionnaire survey was distributed to 180 students who were completing the Building and Sustaining Strategy module and 169 responses were received. The survey asked students for their objective evaluation of each stage of the module, including how their feelings, attitudes and behaviours changed at each stage. Additional data collected was qualitative in nature, consisting of 35 semi-structured interviews with representatives of each of the student simulation groups. This data will be analysed in future studies by the employment of a modified grounded theory approach within an over-arching interpretivist methodology.

4 Case example

4.1 The module

This study is based on a 'capstone', double-semester, level 6 strategic management module at the University of Gloucestershire in the UK, delivered in academic year 2011/12. The cohort size was approximately 200 final year undergraduates, evenly split between UK and international (mainly Chinese and EU/Erasmus) students. The majority of students (>90%) were aged between 18 and 23. The module was taken either as a required component for Business Management undergraduate degree courses, or as an optional/elective for students studying related courses such as Marketing, Accounting & Financial Management; Hospitality and Human Resources Management.

The module employed a blended learning pedagogical approach, including whole cohort face-to-face lectures, a series of regular seminars (between sixteen and twenty-five students per class), online content through a module text-specific learning system (including videos, self-assessment and further reading) and a dedicated in-house VLE (Moodle) site. In addition to this, the second semester work was geared towards an assessment task based around a six week long online simulation exercise, in which students worked in "management" teams of four to six members.

The module delivery was designed to cover three stages of strategy: analysis, choices and implementation. Involving a range of case studies, the first semester encouraged students to build knowledge and understanding of strategic management theories and tools/models e.g. for environmental analysis, strategic positioning, strategic directions and methods. In contrast, the second semester concentrated on the implementation of strategy (*strategy-as-practice*), with the pedagogical focus shifting to an experiential learning approach.

The assessments included a written portfolio in semester one, submitted in two parts – the first for formative feedback, the second for summative – followed, in semester two, by a report on the group-work simulation exercise

experience. The report centred on developing and implementing a business plan in a simulated environment, adapting to feedback e.g. from evolving financial and non-financial KPIs, and analysis and reflection on the decisions taken and final outcomes.

4.2 The Simulation – Alignment with the seven stage model

In order to evaluate the seven stage model against student and tutor experiences, this section provides a consideration of each of the stages outlined in the model in the context of the case study module.

In terms of **student needs** and **educational competences**, the module was designed to incorporate four key elements of the University's Learning Teaching and Assessment [LTA] strategy: independent and collaborative learning; learning for life and employment; learning for the future (including sustainability and global awareness); research/practice-informed teaching and learning. The module began with a focus on independent learning and the development of students' research and resource investigation skills. Emphasis gradually moved to the application of knowledge and skills in real-world contexts (simulated or actual). The group-work simulation assignment involved membership of a global management team, responsible for strategic decision-making – under changing conditions – to ensure a business develops sustainably and profitably over several years.

The aims, **learning objectives** and learning outcomes were defined in the module descriptor, communicated and available to all students through the Moodle VLE. A proprietary business simulation was chosen which would enable students to develop and practice the relevant competences, consistent with the specified learning outcomes [LOs] and the LTA elements (as above) i.e. with the three first stages of the SBT model's process.

Performance measures were outlined and specified through assessment mark rubrics. Furthermore the simulation had performance indicators embedded into the system, in the form of financial and non-financial key performance indicators [KPIs], released on a sequential basis (see below). Although these provided weekly feedback to groups on their company's performance e.g. share price and P/E ratio movements, further feedback was available in the weekly seminars, with opportunities for tutor-group discussions as well as peer-to-peer feedback.

The simulation (**trigger event**) was based around a fictional company, with each student group taking the role of a board of directors responsible for strategic management of the company. Online documents related to the organisation, its environment and core business information were provided for students six weeks prior to the start of the simulation, as part of preparation

work. Prior to commencing the simulation, each student group was required to develop a short written business plan for the fictional company, based on the provided documentation.

Once started, the simulation consisted of a number of weekly 'board meetings' that required discussion of three main components: selecting a meeting agenda; deciding courses of action for the selected agenda items; and analysis of outcomes. Post-decision outcomes (**developmental feedback**) were provided by the simulation tool in the form of company financial statements plus financial and non-financial KPIs. Analyses required reference to a team's own business plan and to relevant strategic management theories and tools. The meetings, and associated reports, were to be completed at the students' discretion, enabling a learner-controlled process that was adaptable to a team's group-working dynamics and practical constraints (such as part-time employment commitments).

Performance diagnosis was based on data derived from two sources:

(a) Outcomes, as measured by the simulation and in the associated assessment reports e.g. attainment grades. An analysis of their performance relative to other comparable undergraduate cohorts is pending – and will be subject to a longitudinal study by the authors. Student attainment grades amongst the student cohort were analysed and indicated a substantial improvement in grades of SBT-related assessments in comparison with those for non-SBT delivered components (e.g. conventional case studies) of the same strategic management module. This observation runs counter to the cited Mitchell (2004) findings and will be subject to further research analysis.

(b) Student feedback, from questionnaires, interviews and reflections. These are discussed in the next section and form a basis for evaluating this blended learning programme through the application of the Salas *et al.* (2009) seven-stage implementation model. Student feedback is critical since each student's experience with the computer-based simulation and the overall module is unique. The questionnaire survey method facilitates collection of data that may assist in generalising some findings. In addition, the interviews and reflections provide deep understanding of students' idiosyncratic situations and outcomes, as students' experiences are a form of symbolic interactionism (Blumer, 1969).

5 Discussion of Preliminary Findings: the students' perspective

The model was found to be a relatively close fit in terms of its applicability to this case study. This enabled the next research objective to be addressed, i.e. the effectiveness of the model (and its application in this module) in shaping strategic management behavioural competencies i.e. meeting student needs.

Student responses to structured questionnaires (n=169) showed substantially affirmative responses to the survey questions about engagement and improvement of skills (see Table 2) associated with the SBT components. The survey outcomes were supplemented by a series of semi-structured interviews (n=35) and written reflections. These are intended to bring an extra level of granularity to the research analyses and findings. Evaluation of the supplementary studies is continuing and it is intended that findings will be submitted for publication in the near future – also forming the basis for a rigorous longitudinal study, concerned with development and validity of prescriptive models for SBT and their incorporation into blended learning pedagogies for management education.

Table 2: Questionnaire survey – a preliminary analysis

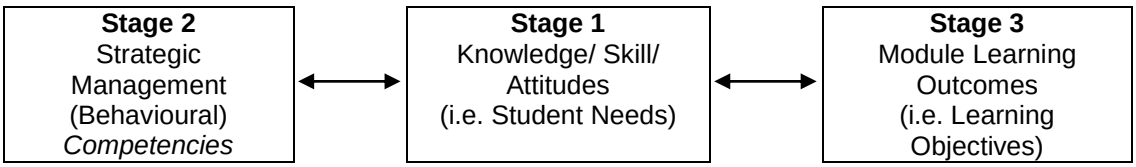
Survey category (K-S-A)	Parameter (student responses on skills development, in relation to the simulation)	Agree or strongly agree	Disagree or strongly disagree	Mean (0-5 scale)	Std. Dev
A (K)	The simulation enhanced my overall learning in the module	65%	9%	3.34	1.38
B (S)	Helped to improve my team-working skills	72%	10%	3.71	1.06
C (S)	More confident in decision-making skills	66%	11%	3.57	1.05
D (S)	Helped to improve my interpersonal skills	58%	12%	3.47	1.06
E (S)	Helped to improve my communication skills	63%	9%	3.54	1.00
F (S)	Helped to improve my negotiation skills	63%	12%	3.53	1.03
G (S)	Helped to improve my problem-solving skills	60%	10%	3.50	1.01
H (S)	Helped to improve my conflict-resolution skills	49%	12%	3.33	0.98
J (S)	Helped to improve my critical thinking skills	65%	10%	3.62	1.03
K (S)	Helped me appreciate the complexity of business strategies	65%	12%	3.63	0.96
L (A)	The simulation made the module more interesting	78%	7%	3.98	0.99
M (A)	The simulation made me more engaged in the module	75%	7%	3.86	0.93

Table 2 findings indicate that students were generally in agreement that the module enhanced a number of skills critical to strategic management. These skills are part of the learning outcomes of the module and underpin the three competencies of effective problem solving, entrepreneurship and leadership.

The items in Table 2 reflect knowledge (K), skills (S) and attitudes (A) acquired by the students. These KSAs are a reflection of Stage 1 (Student Needs) and are the conduit that links between Stage 2 (Competencies) and Stage 3 (Learning Objectives). A mapping was performed to link the three stages together and is illustrated in Figure 2. As an example, the competency

of Effective Problem Solving (Stage 2 - Competencies) is dependent on Critical Thinking (Stage 1 – Student Needs), which in turn is met by one of the module's learning outcomes (i.e. Learning Objectives) of demonstrating effective application of strategic management principles.

Figure 2: A framework for mapping desired behavioural competencies, knowledge, skills and attitudes acquired, and module learning outcomes



An additional observation from Table 2 relates to the levels of engagement and interest in the module, associated with the simulation: attitude responses L and M generated even higher scores than for perceived skill acquisition. This positive co-efficient bodes well for the use of SBT to engage students.

6 Conclusions and implications

The findings presented in this paper demonstrate a close alignment with the expectations of a prescriptive seven-stage model developed by Salas *et al.* (2009), when applied to the case study module and its adopted blended (teaching and) learning strategy of balancing didactic and SBT approaches.

In drawing conclusions we note that "Educational Competencies" may be a misnomer and the label "Professional/ Field Competencies" is perhaps more appropriate. We also note that the assessment criteria only involved Knowledge (e.g. application of theory) and Skill (e.g. written/ communication). Hence, some of the related Learning Outcomes were measured within the rubric, which outlined a continuum of poor, threshold and superior performance. Competencies were not assessed directly as they are latent i.e. it was assumed that the written work reflected the development and application of the problem solving, leadership and entrepreneurial competencies. The main critique here is that competencies are inherently difficult to measure. Salas *et al.* (2009) mention that a range of assessment techniques should be employed, as was done in the blended learning module delivery studied here i.e. portfolio, business plan, minutes, financial and non-financial KPIs, and reflective essay.

This noted, we find that the obtained and presented data support claims for the expected outcomes of the prescriptive seven-stage model, when that model is implemented as prescribed. The survey data support this position by indicating that the computer-based simulation undertaken, and therefore the model, has positively shaped the students' strategic management behavioural competencies.

The findings from this study contribute to the academic debate surrounding the use and efficacy of SBT within business and management education. It is found that the Salas *et al.* (2009) model is relatively robust in terms of the case study module examined in this paper i.e. the use of SBT in this particular context has shaped students' competencies in a positive manner. The authors propose that this is primarily because each of the seven stages of the model was addressed effectively by the tutor team, during the strategic management module's delivery. These findings should prove valuable for academics and practitioners with an interest in the use of simulations, either as a blended learning dimension or as a stand-alone business education activity.

The next stage of the research aims to gain further insights into how and why this positive outcome has been achieved, and how it can be reproduced in other educational and training contexts. Along with a deeper analysis of the questionnaire survey, this will also involve an analysis of the semi-structured interviews and written student reflections. Those findings will then form the basis of a rigorous longitudinal study that will further examine the development and validity of prescriptive models for SBT, and their effective integration into blended learning pedagogies for management education.

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