

The use of a Computer-Based Simulation Game (CSG) for Learning and Teaching

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Introduction

A computer-based simulation game (CSG) was used for the first time in a final-year undergraduate module. A change management simulation game was used in the seminar classes as a formative exercise that was linked to parts of the students' summative assessment. The module evaluation suggests that most students learned from using the CSG.

The Module

The module, BUSM3003 Enhancing Organisations and Employability, is delivered at Level 6 (Qualifications and Credit Framework) and is worth 15 credit points. The module is delivered over one semester. The module has three cohorts, with the largest cohorts, A and B, in semester one totalling approximately 230 students, compared with 25 students in Cohort C, in semester two. There are two primary aspects of the module. The first is in regards to change management, whilst the second is in regards to employability. The emphases between the two fields were approximately two to one.

The Computer-based Simulation Game

Two off-the shelf products were shortlisted from a wide desktop search for change management CSG, 'The Executive Information Systems (EIS) Simulation: The Change, IT Innovation and People Management Challenge' (from INSEAD Business School) and 'Change Management: Power and Influence V2' (from Harvard Business Publishing). The CSG from Harvard Business Publishing was selected as it was deemed to be comprehensive (in terms of support materials) and theoretically sound (each aspect of the simulation was linked to theory in the support materials). The simulation has four scenarios, based on the combination of two constructs; the relative power (authority) of the change agent (i.e. the role that the student plays) and the relative urgency (i.e. immediate change or long term) associated with the change initiative. The learning outcomes of the module and of

the CSG (Harvard Business Publishing, 2013) are consistent with one another as Table 1 below illustrates:

Table 1: The Module and CSG Learning Outcomes

Module Learning Outcomes	CSG Learning Outcomes
<ul style="list-style-type: none"> Critically analyse an organisation's current situation using appropriate models and techniques. 	<ul style="list-style-type: none"> Gain insight into why individuals and groups might resist change and how to overcome that resistance (using social network information). Form a better understanding of not only how to choose appropriate change strategies and tactics but also how to sequence them, given the contextual contingencies.
<ul style="list-style-type: none"> Recommend changes to enhance organisational effectiveness and how these changes could be managed. 	<ul style="list-style-type: none"> Practise diagnostic and action planning skills in regards to leading strategic change. Identify common (mis)steps of change agents and how to (avoid) improve them.
<ul style="list-style-type: none"> Critically evaluate your skills and ability to contribute to the effectiveness of an organisation. 	<ul style="list-style-type: none"> Develop an appreciation for key contextual contingencies when implementing change.
<ul style="list-style-type: none"> Use a range of appropriate academic and business sources 	<ul style="list-style-type: none"> NA

The learning objectives of the simulation closely reflect some of the learning outcomes of the module. The simulation included 18 change levers that students could use to influence their virtual colleagues and ultimately move the organisation towards the change (future state). A dashboard is available to students that record their previous actions and to track their progress in terms of individuals they have influenced and the cumulative progression they have made organisation-wise.

The students were required to enact change within four scenarios, which is the combination of two factors with two degrees each (i.e. high and low). The four scenarios were:

1. High power and low urgency.
2. High power and high urgency.
3. Low power and high urgency.
4. Low power and low urgency.

Each scenario is a discrete run and within each scenario, students were tasked to enact change, by building and maintaining credibility by using the change levers appropriately:

1. Applied to the 'right' person.
 - a. Consider their work and social network/ influence.
2. At the right time.
 - a. Organisational and individual level change phases.
3. In an appropriate sequence (combination).
 - a. Combination of change levers.
 - b. Appropriate spacing of usage.
4. Build Critical Mass as quickly as possible within the 96 Weeks (virtual world) period
 - a. Consider and convert individuals into the adoption stage.

Instructional design: Integration and Implementation

The simulation was used as a formative exercise over two seminar classes towards the end of the 'change management' session of the module, just before the submission of an assignment in regards to the topic. Students were placed into groups of three to five individuals to engage with the simulations and informed that prizes will be awarded to the top six groups with the highest scores. Students were requested to discuss and debate the next course of action prior to recording their decisions in the simulation.

The first session was organised as trial/practice run for students to familiarise themselves with aspects of the simulation such as the navigation and functionality. The first session involved 'scenario two'. The second session was organised as a three-hour seminar and students were asked to complete scenarios one, three and four. Students were provided a comprehensive document that contained the user the guide, transcripts to the 'interviews' in the simulation (for students with disability), hints on how to engage with the simulation and lessons that may have been helpful to the assignment, and plain worksheets for students to record lessons learned whilst engaging with the simulation.

If the CSG had not been used, the seminar activity would have been developed to integrate the students' learning over the past weeks on change management similar to the main aim of the CSG (the CSG was only effectively used in one seminar class, thus the development of a capstone seminar activity would have been rather straightforward).

Learners' Experience and Feedback

Interviews were held with a number of students concerning their experience with the simulation, and its application within the module. Some of the feedback includes the following:

1. The real-time feedback from the simulation was very helpful. Students could immediately view the results of their decisions.
2. The real time feedback facilitated students' abductive reasoning skills in helping them trace and deliberate on decisions that were appropriate.
3. Students who have taken up a placement position in the third year of the undergraduate studies and/or are currently working part time mentioned that the informal networks of the simulation were quite authentic.
4. Working in groups helped as some students felt that this format facilitated indirect learning and developed other skills such as negotiation and team working.
5. The competitive element of the simulation was stimulating and provided additional motivation to engage and do well.
6. Some students felt that the trial/practice run was helpful and prepared them for the subsequent scenarios. They also felt that timing of the simulation in the module was just right as they have had sufficient input, in terms of the theory, to have the confidence to engage with the simulation.
7. The debrief session in the following week of the second session was very helpful as the tutor linked various aspects of the simulation to the assignment.

The data from the interviews suggest that, at the very least, the students enjoyed the CSG as it was novel. The positive emotions that the CSG evoked help to raise the students' interest in the subject matter and module. Students with work experience stated that the CSG provided scenarios that they 'could relate to' whilst students without work experience stated that the CSG provided them with a 'better understanding' and 'insight' into what change management was about. All the interviewees unequivocally stated CSG helped to reinforce the knowledge gained in the lectures.

The module evaluation was completed by 139 students. A content analysis was performed on the free-text section of the module evaluation. This analysis revealed that 48 students made comments concerning the simulation, of which 36 comments were positive, 3 were generally negative, whilst 9 were ambivalent/neutral (i.e. constructive suggestions for improvement).

Examples of positive comments, in verbatim, are:

5. 'Simulation showed how changes should be implemented'.
6. 'The simulation was good'.
7. 'The emphasis on real-life situations to explain the theory. Simulation'.
8. 'The simulation because it was fun'.
9. 'Simulation was very good in communicating what was being taught on the module - very engaging. The scope and freedom to shape the assignment has made completing it very interesting and interactive in using a wide variety of resources that I found most appealing'.
10. 'More group work and simulations'.

Examples of other comments, in verbatim, are:

- 'Explain the purpose of the simulation better and when to use levers'.
- 'Lecture on simulation would have been more useful closer to the actual simulation (2nd future week was in-between)'.
- '2 weeks spent on simulation, 1 might have been more time efficient'.

Reflection

Overall, the simulation seemed to have been a success in terms of engaging the students, raising interest in the subject matter and most importantly, improving students' learning. With three years of experience in using CSG particularly in the field of strategic management, I believe I have gained some insight in evaluating learning gains from the use of CSG. I believe 'two levels' of learning have taken place in this instance: i) learning related to the subject i.e. change management, and ii) team working skills.

I believe the learning objectives of the simulation had been largely attained by the students, specifically in terms of appreciating the contextual-nature of change, gaining insight into when to apply/use the right change levers and how to overcome resistance to change. I believe that this has taken place as the CSG closely mirrors the relevant change management theories (and of course, reality) that were delivered in the lectures. Also the real-time feedback based on the students' actions enabled the students to swiftly learn from their actions and engage their abductive reasoning (e.g. trial and error). The simulation also contained videos of the students' colleagues talking to them, which enhanced the realism of the role playing. Finally, the level of interactivity in the simulation (e.g. variables change in reflecting students' actions and decisions) also helps students to learn (from their specific actions and decisions) reflecting a form of 'deutero-learning' (Visser, 2007).

In addition to learning from the simulation concerning the subject matter i.e. change management, students were also able to learn from the groups they were in whilst engaging with the simulation (i.e. using the simulation as a vehicle for learning). I believe the students were able to improve a number of skills through working in groups, such as team working, negotiation, conflict resolution, interpersonal and argumentation skills. A number of students also stated that it was a good idea to give them a 'trial run' in the form of 'scenario two' for them to get used to their team members as well as the simulation in terms of the layout navigation, in addition to the nature of the CSG, which was well complemented by the guide provided.

The CSG is neither a luxury nor a necessity (as yet in some cases) although I believe it does categorically add value to students' learning and achievement. Other aspects of the module such as the clarity of the assessments, the supply of study materials in the seminars, the link between the formative exercises and the summative assessments, the availability of the study materials (electronic links to the main textbook and other relevant journal articles were provided) and the teaching style may have positively contributed to the student feedback that was encouraging in the module evaluation in addition to the use of the novel CSG. Would the module evaluation have been better or worse without the CSG? I believe the CSG did help with improving the module evaluation (as evidenced by the positive feedback), however, the degree to which it has helped is arguable.

The use of CSG is situational and must be integrated with the rest of the curriculum to be effective. CSG must be accompanied with an instructional design (e.g. integrated with lectures and assessments). Such an instructional design may come in the form of a guide (such as that created in this module). The implementation of simulation was, however, not without problems. The simulation (web pages) took a while to load for some students. The root cause of this is unknown. The lesson here would be to further explore the technical aspects within the University to further support the use web-based simulations.

References

Harvard Business Publishing (2013) *Online Simulations*, Harvard Business Publishing, [Available at: <http://hbsp.harvard.edu/list/simulations>], Date Accessed 16th December 2013.

Visser, M. (2007) Deutero-learning in organisations, A review and a reformulation, *Academy of Management Review*, Vol. 32(2), pp. 659-667.

Biography

Mark Loon is a Senior Lecturer in Worcester Business School. His research areas include innovation and design, systems thinking, problem solving, leadership, learning, and personality. He teaches human resource management and change management. Prior to joining academia, Mark was a management consultant and had worked with firms such as Ernst & Young, Cap Gemini and KPMG. As an independent management consultant and business analyst, Mark has worked for companies such as QBE, AMP and Morgan Stanley. His public sector clients include the Prime Minister's Department of Malaysia, the Ministry of Finance of Indonesia, and the New South Wales State Government.