

DISTANCE EDUCATION DELIVERY OF AN INTENSIVE SIMULATION BASED COURSE

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ABSTRACT

This paper describes the structure and learning outcomes of a rigorous and immersive Business Simulation course, including the planning for and execution of the integration of distance education and regular in-class students in a competitive environment. By using a web-based simulation and various communication technologies students inside and outside the classroom competed in a single industry and achieved common learning outcomes. Observed interactions, formal feedback and grade comparisons between the in-class and distance groups of students confirmed the trial's success, providing the same depth of experience, realistic sense of competitiveness and intensive team interactions for all participants.

INTRODUCTION

To meet the growing demand for alternative course delivery in 2003 and beyond Okanagan University College offered a business diploma capstone course, BUAD 272 Policy Simulation, via distance education. This required modifying the course to meet the needs of in-class and DE students simultaneously, researching and selecting a suitable simulation and textbook, and evaluating and utilizing various communications technologies. A primary benefit of Internet based instruction, particularly for working students, was to reduce reliance on the three pillars of traditional instruction: fixed location, fixed time and fixed learning pace (Smith, 2001). The principle objective of delivering Policy Simulation through DE was to eliminate the fixed location pillar while achieving the same learning outcomes and immersive experience realized by in-class students.

The cornerstone of successfully delivering the course to the DE students was the LEARNLINC software which supported the real-time, virtual classroom experience. A prototype for an integrated Policy Simulation course was developed and delivered to a total of 30 students—25 in-class and five through DE. Upon completion, student feedback and performance measures did not reveal significant variances between the DE and in-class students on the basis of marks, simulation results and attaining the overall learning objectives.

BACKGROUND

Okanagan University College (OUC) is located in various centres in the Okanagan region of British Columbia, Canada. The business program was developed in 1970 and offered only in Kelowna. Today, business courses are also offered in Vernon, Penticton and Salmon Arm, with degree-level courses only available in Kelowna. The Business Administration program offers a two-year diploma and a four year Bachelor (BBA) program.

OVERVIEW OF POLICY SIMULATION COURSE

Policy Simulation (known by all students and professors simply as “Policy”) is a culminating capstone course for diploma students. The 2003-2004 OUC academic calendar gives the following description:

In this course the student will experience the decisions and interactions a manager in a typical business would face. Through the use of computer simulation the student will work with other students as a member of a business team. Each member will assume the role of a manager in a specific department (Finances, Management, Operations, Marketing, and CEO) and work together to formulate a successful business strategy. They will input decisions into the simulation, which is processed over a simulated 4-8 year business cycle, and challenge their abilities to adapt their business decisions in order to prosper under changing economic and competitive conditions. (Okanagan University College Course Calendar)

The main learning objectives of Policy Simulation are for students to be able to confidently self-determine a strategic approach to business by applying and synthesizing theories, techniques and administration skills learned in previous and/or concurrent courses and/or real-world experience. In other words, students should be able to achieve specific corporate goals by drawing together their intrinsic and extrinsic knowledge of general business theories and experience. One of the most significant aspects of the course is to be able to integrate financial ratio data and

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analysis and make well-informed department-specific decisions. In his study on business games, Sauaia concluded that “learning by memorizing does not actually build meaning that lasts for long, since those who acquired this kind of knowledge were not able to duly apply it. Learning by doing stimulates curiosity and the search for a not yet memorized knowledge which leads to more adaptive behaviours and sustainable team performance” (Antonio Sauaia, 2004). In essence, the overriding learning objective of Policy Simulation is to educate and prepare future managers to apply their knowledge and experience to overcome or avoid problems as well as identify and capitalize on opportunities.

The key element of Policy Simulation is the real-world, immersive experience it creates. At any time during the course students could be “called out” for a meeting with the Chairman of the Board. The purpose of this exercise is to examine students’ aptitude for responding to specific questions, to test general knowledge of responsibilities and simulation constraints, to evaluate and explain the steps taken to reach both departmental and company-wide goals and objectives, and to critique and coach as to how to deal with one-on-one, “off-the-cuff” questions. Questions cover a wide variety of business topics, mostly department related, but also in relation to the entire company, the competitive environment and the overall economy. Answers are measured on qualitative and quantitative analysis, confidence of the individuals and the articulation of central strategic concepts or directions.

The final project is a very intense culminating event for both the simulation results and the results of Board Presentations. All business students know this day as “Policy Day” where the Board Presentations are delivered to panels of volunteer judges from the business and professional community who then, in turn, identify areas of concern in the corporate strategy and ask questions about how to improve performance.

Policy Simulation requires students to apply theories and practices instructed in Business Math and Communications, Computer Software, Management, Marketing, Operations, Human Resources, Accounting and Finance as well as the synthesis of all business concepts and applications into a cohesive and coherent corporate strategy.

Business students are generally known to be quite competitive. Each team’s progress becomes public knowledge as a result of the release and posting of various reports generated by the simulation and administrator. Students’ responses make it clear that Policy Simulation offers a unique opportunity for students to quantifiably measure their individual and team performance against their peers’. Upon debriefing, many students acknowledge that Policy Simulation acts as a “litmus test” of their cumulative business skills and that, overall, the competition in Policy Simulation is intense, vocal and, above all else, very real.

When designing the DE course structure the work of Gosen, Washbush and Faria was considered. Their research identified that individual success in course and simulation standings are based in part on each person’s characteristics

including academic ability, participant motivation, team-building and cohesion, degree of team organization, team goal setting, degree of team competitiveness, perceptions toward the particular simulation, and perceptions about simulation games as a learning tool (Gosen and Washbush, 1998). Enhancers to the classroom learning environment include instructor involvement, debriefing opportunities after each decision, and simulated related outside assignments. Success inhibitors include the amount of time pressure or artificially induced stress between decisions (Faria, 2000). The course structure and content were amended in light of these observations.

Course Structure

Policy Simulation is comprised of four fairly distinct semester sections:

Section 1. 2 ½ introductory weeks that cover the functions and contributions of each department (Marketing, R&D, Production, HR and Finance), an introduction to Strategic Planning and a theoretical overview of the simulation. Instructors deliver demonstrations and simulation-based tutorials, provide answers to technical or strategic questions and offer assistance and advice during lab time when students can practice entering decisions. Teams for the “Trial Round” are selected.

Section 2. 2 weeks of Trial Round competition wherein teams compete over a simulated four-year period (four sets of decisions). Worth 5% of the final course mark, students take the trial run semi-seriously with acknowledgement that it is the best time to test various strategic approaches or tactics without fear of serious consequences to their grades. After each of the four decisions, some student teams are “called to the board room” to report on their results, outline their future goals and defend their strategies.

Section 3. A 1½ hour midterm-level exam of 100 multiple choice questions exclusively about simulation rules and parameters. Selection of second-round teams. Input, processing and analysis of 5 years of simulation activity (taking place over 5 weeks). Board presentations for selected teams after each simulation run. Comprehensive written Strategic Plan at the end of the third week.

Section 4. Two weeks of in-depth analysis and debriefing sessions covering corporate performance, successful strategies and areas for improvement. Several days of preparations for final presentations to the Board of Directors that includes individual and team questioning as to strategic performance and future direction. The morning of Policy Day is dedicated to student teams making their final simulated decision and students meeting individually with a judge for a 15 minute interview. In the afternoon student teams make their 30 minute strategic plan presentation to a panel of

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business experts, followed by a sponsored dinner and awards ceremony.

THE CHALLENGE: POLICY SIMULATION BY DISTANCE EDUCATION

Policy Simulation helps students develop critically important business skills such as coping with competitive and stressful team situations, creative problem solving, critical analysis of data and subsequent decision making, strategic thinking, planning and execution, and the articulation of all aspects of a selected course of action. Naturally, this involves extensive in-person team exercises, meetings, discussion and decision making. Hence, the biggest challenge for a Distance Education version of the course was to create a process and system that would support and facilitate the development of the aforementioned abilities and team-based decision making while reaching students in various out-of-class locations.

Another important challenge was the time-sensitivity of decision inputs and processing. Many students take DE courses with the assumption that they self-schedule and submit work “at their own pace.” However, because DE teams for Policy Simulation compete in the same industries as their in-class counterparts, it is imperative for DE students to meet the same deadlines for uploading decisions (usually 8:00 p.m. on the selected day), for submitting reports and for conducting presentations. Unprecedented for most DE courses, this advanced level of timing and task coordination between both the DE students and the instructor was (and will continue to be) another challenge for designing and implementing a standardized system for DE delivery.

PROCESS OF DELIVERY THROUGH DE

Prior to offering the DE version of Policy Simulation (for the first time) in September of 2003, research was conducted in two key areas: Choice of Business Simulation and Communications Technology Applications.

CHOICE OF BUSINESS SIMULATION

Over the years, OUC has used several different business simulations to teach Policy Simulation including CORPORATION (by Jerald Smith & Peggy Golden), AIRLINE (by Jerald Smith and Peggy Golden), and THE BUSINESS STRATEGY GAME (by Thompson and Strickland). From Fall 1997 to Winter 2003 the simulation used for Policy Simulation was THE BUSINESS STRATEGY GAME.

THE BUSINESS STRATEGY GAME (BSG) provided students with a rich learning environment with regional and international markets, economic indicators and fluctuations, excellent scenario analysis tools and three year strategic planning options, all set within a truly realistic global industry: running shoes. While an excellent business

modeling tool, the depth of complexity and number of variables involved in BSG made it best suited for higher-level business students who have completed at least one strategic management course.

The learning curve for 4th semester, second year diploma students was very steep for BSG and over several years Policy Simulation had gained a negative reputation for being a serious challenge and absorbing a disproportionate amount of time and energy. In reality, many students felt overwhelmed and completely lost even after an entire month of lessons and practice rounds. The business faculty concluded that BSG was more appropriate as an advanced business simulation course in either the 3rd or 4th year of the degree program. Hence, a new simulation program had to be found.

A “Google” search for “Business Simulation” yields over 120,000 results, showing the vast number of options that exist. To streamline the selection process some criteria were developed for evaluating the relative merits of each simulation. The criteria, listed in no particular order, included direct cost to students, ease-of-use for students and instructors, simulation sophistication/degrees of freedom, educational fit with the diploma program, and quality, quantity and availability of support materials, reports and personnel. Based on these criteria, two simulations were short-listed, MIKES BIKES and FOUNDATION, evaluated for compatibility against the aforementioned criteria as well as against each other. The best balanced choice was the FOUNDATION (distributed by Management Simulations, Inc. who also support a more advanced, yet similar simulation called CAPSTONE)—both of which are based on an electronic sensor industry.

FOUNDATION offers Web-based simulation lessons, lessons on general and specific responsibilities of student teams, and valuable analysis and forecasting tools. Other instructional components of FOUNDATION include quizzes, tutorials, how-to demonstrations, recommended report content and formats as well as options for on or off-Web decision making, team communication tools and strategy hints. There are also optional HR and TQM modules for more advanced students/situations. All in all, the flexibility, complexity and comprehensiveness of the FOUNDATION simulation, combined with the Web-based tutorials, lessons and resources, was determined to be the best fit to meet the needs of instructional faculty, in-class students and those taking Policy Simulation through distance education.

CHOICE OF COMMUNICATIONS TECHNOLOGY

A number of different communications technologies were required to deliver the course via DE. Hi-tech teaching and learning presents a number of opportunities and challenges most faculty and students need time to realize and (time to) adjust to (Cates 1996). After testing several methods, two technologies, LEARNLINC

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VIRTUAL CAMPUS and MSN MESSANGER 6.0, were employed to deliver the course for the Fall semester of 2003.

LEARNLINC VIRTUAL CAMPUS

LEARNLINC was the backbone technology used to expand the classroom experience to Distance Education students. Six of the most important features of LEARNLINC are as follows:

- *Voice Over Internet Protocol (VOIP).* To deliver a truly interactive and real-time version of Policy Simulation, audio was delivered and transmitted through LEARNLINC's VOIP. All DE students were required to have either a headset with microphone or a speaker and microphone configuration for receiving and sending audio. The VOIP was used between students as well as with the instructor. During question and answer sessions, DE students were obligated to respond in real-time with the same verbal justifications for their strategic decisions as their in-class counterparts, making LEARNLINC a necessary component of the DE course content delivery.
- *Application sharing and synchronized Web browsing.* LEARNLINC allows multiple participants to watch or simultaneously participate in the use of application programs using this feature. It was used extensively throughout the course with the heaviest usage during orientation and practice rounds. LEARNLINC is one of the only communications technologies that enabled multiple users to access or view password-protected applications, which FOUNDATION is. Next, LEARNLINC supported the instructor-led tutorials, how-to demonstrations and PowerPoint presentations with the synchronized Web browsing function. Interestingly, DE students used the real-time voice communication and text-messaging utilities of LEARNLINC to "virtually" huddle around their computer screens and discuss strategies and decisions—just like the in-class teams! LEARNLINC also enabled simultaneous remote access to Microsoft office for the DE students for a myriad of uses: viewing and analyzing decision results and simulation outputs, creating and rehearsing PowerPoint productions and, most importantly, the final Strategic Plan and Board Presentation.
- *Electronic Hand Raising.* Students could indicate they wanted to join discussions or ask questions by clicking a raised hand icon in the LEARNLINC window. The reciprocal icon would flash on the administrator's screen and students could be "given the floor" when the current floor-holder was done. DE students could ask and speak to verbal questions in real-time using a combination of speakers, microphones, overhead projectors (so in-class students could see text messages), web cams and headsets to support the VOIP.

- *Electronic Q&A.* LEARNLINC offers several forms of question and answer formats for instructor-student interaction including yes/no, multiple choice, ranking scale and or proportionality/percentage-of questions.
- *Text Chats.* Much like any other real-time communication medium, LEARNLINC offers a publicly-viewable text chat option. As expected, this proved to bring levity as well as a number of different perspectives to in-class discussions.
- *Interactive Whiteboard.* The LEARNLINC interactive Whiteboard served as a visual tool to enable students to follow ideas, notes or diagrams and to even make amendments if they saw fit. A standard web application.
- *MSN MESSANGER 6.0.* Private "call-out" meetings were arranged with each DE student using MSN MESSANGER 6.0 (which supports Web cams) in conjunction with the LEARNLINC VOIP. Students were interviewed and questioned in this real-time, videoconference-type application and expected to behave like stay-at-home professionals in terms of attire, attentiveness and attitude. DE students were graded against the same criteria as in-class students (as outlined above).

SUCSESSES AND CHALLENGES

The following student feedback provides an important indication of both the successes and limitations of the DE course delivery. These quotes have been paraphrased from anonymous course evaluations submitted by DE students who participated in the Fall of 2003:

"For me the course served its purpose the way I had envisioned it. What I mean by this is (that) I could sit at home ...so I could be with my newborn and listen to the class lecture while still having the opportunity to converse with you (Norm Letnick): pretty cool I think."

"One primary success was being able to form a functional and successful team (as CEO) without ever meeting most of them face-to-face. I feel that this is going to be a growing format for (conducting) business in the near future and this course is the only opportunity I have had to develop my online skills. The second primary success was that meetings tended to stay on topic more often. I believe this was due to the nature of communicating via MSN and LEARNLINC."

"The technology side of things was a great challenge. Our team made it work but only two people could be talking at once."

"The most significant (challenge) was the experience with the online presentation involving Power Point. The program was delayed when

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presenting online and disrupted the flow of the presentation.”

Another success of the DE integrated Policy Simulation course was the similarity in final grades of the DE and in-class students. To arrive at a final grade, Policy Simulation students are evaluated across the following eight performance areas (presented roughly in chronological order):

1. Executive summary writing exercise
2. Practice (4 year) round
3. Examination on simulation rules/parameters
4. Individual presentations to the Chairman of the Board (ongoing)
5. Full-length (8 year) round
6. Strategic plan
7. Beginning team presentations to Board of Directors
8. Final team presentation to Board of Directors

Table 1 shows the comparison of performance area and final grades of five DE students to 25 in-class students. In general, it appears that DE students fared as well as their in-class counterparts.

It is apparent from the comparatively identical grades, other than the Final Board Presentation category, that the learning objectives of Policy Simulation can be accomplished through a DE course delivery format and that Distance Education students fared almost identically well across the eight Performance Areas. As such, their remote participation via the Internet and computer technology did not seem to negatively impact their learning outcomes as measured by their average grade. The simulation marks above are consistent with the findings of Denise Markovich (1997) that provide statistical evidence which indicates students at the distant sites were not adversely affected by lack of on site instruction.

RECOMMENDATIONS FOR CHANGE

Based on the above comments, direct observations from the instructors, analysis of student outcomes and informal feedback/observations from various sources, the recommendations for subsequent DE versions of Policy Simulation are as follows:

Require all DE students to use microphone headsets. Those who used headsets had high-quality sound input and output while those who used a free-standing microphone and broadcast speaker configuration created audio feedback problems for other students and had lower quality for both inputs and outputs.

➤ *Institute early registration deadlines for DE students.* DE students must be familiar with the use of the required computer hardware, software and communications technologies: LEARNLINC, MSN MESSANGER 6.0 with Web cam and synchronized web browsing. Some minor in-class delays were experienced due to technical awkwardness/inexperience. These delays could be eliminated by providing a technology workshop prior to the beginning of classes. Additionally, DE students must recognize that Policy Simulation is NOT a self-scheduled course and that there are stringent time requirements and deadlines.

➤ *Require DE students to conduct in-person, on-campus practice presentations prior to Policy Day.* Other teams are given ample opportunities to practice team presentations and receive feedback. The same opportunities should be given to DE students. At least one time prior to Policy Day, the DE team(s) should be required to present a “practice run” in person to an instructor. Implementing this requirement should help improve team cohesiveness and the likelihood of a Board Presentation final mark as strong as the in-class average. The requirement for DE students to participate in both an on-campus practice run and

Performance Areas	In Class Average Mark	DE Students Average Mark
1. Executive Summary	59	60
2. Strategic Plan	66	67
3. Practice Round	74	84
4. Full Round	72	73
5. Board Chair Presentations	76	79
6. Test on Rules	71	74
7. Practice Board Presentation	77	78
8. Team Board Presentation	75	69
Overall Course Final Grade	72	73

Table 1. Comparison of average marks

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Policy Day does somewhat reinstate the fixed location pillar (Smith, 2001) even if it is only for one day. Reinstating this pillar may also reclassify the course from a true DE course to a hybrid course (Potosky, 2004). An alternate strategy for facilitating the Policy Day presentations for the DE teams without reinstating the fixed location issue is to allow/support videoconferencing for both practices and final presentations.

CONCLUSION & LIMITATIONS

The DE course delivery for Policy Simulation met all expectations and objectives with minor challenges existing solely in the realm of technology applications. The Distance Education students experienced the same immersive and intensive experience of operating a simulated multi-million dollar business as their in-class counterparts including the same level of team synergy challenges and inter-personal conflicts. Grade comparisons between both groups reveal that DE students were able to achieve the same learning objectives and perform at the same level as in-class students.

All in all, using an integrated approach in mixing both in-class and DE students created a very unique learning situation, provided real time experience with technologies being rapidly adopted in the business world and to achieve an overall successful educational experience for both groups. In the future, and if the demand exists, a section of Policy Simulation delivered exclusively through DE would be possible using the same communications technology as outlined in this report.

It is understood that a sample size of 30 students, with only five from DE is very small. In the Fall of 2004 the DE integrated course will be delivered again, with actions taken to address the challenges stated above and careful monitoring for improved outcomes. Data will be collected from these new participants and compared to the existing set. I would be excited to hear from anyone who would like to collaborate on further research into this area.

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