

THE USE OF A SIMULATION IN AN INTEGRATED MBA CURRICULUM

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ABSTRACT

Simulations in MBA curricula are used extensively to teach discipline specific content. Recently, schools developing an integrated approach to their curricula use simulations to integrate one or more courses in an emulation of the business environment. This paper describes the use of a simulation as a vehicle for integrating coursework throughout an MBA program curriculum.

Keywords: experiential learning; business simulation; integrated curriculum

Increasingly, the business community has placed demands on universities to develop students who are able to think and act holistically (DeConick and Steiner, 1999). In 1988 Porter and McKibben discussed the need for more integration in the curricula of MBA programs. It is clear to the business community that operating in discipline-specific areas (silos) is not appropriate in today's business environment.

Many universities currently are addressing MBA program curriculum integration. Baylor promotes a program that uses three "lockstep" semesters and one summer semester. They divide their program into specific segments that focus on the business cycle of planning, implementation, and evaluation (Wilson, 1999). The University of Denver uses seven team-taught, interdisciplinary courses to address integration as well as to respond to the accusation that business faculty are methodologically obsessed (Slater, et al, 1995). Real curriculum integration requires significant resource commitment, faculty flexibility and commitment, and a strong understanding of the curriculum from all aspects of its application.

A majority of business schools use simulations as part of their curricula, and more than 60% of large businesses use them as part of their education programs (Faria, 1998). However, the use of simulations is not applied uniformly. This paper addresses the use of simulations within integration modules in a newly-revised MBA curriculum at

The Graziadio School of Business and Management at Pepperdine University.

PROGRAM DEVELOPMENT

A cross-disciplinary faculty committee revised the fully-employed MBA (evening program) curriculum at the Graziadio School. The committee considered various curriculum models and revisions to existing courses along with the methodology for integrating the course material within the various courses. The program consists of twelve four-credit courses, including eight core classes, three electives and a strategy capstone course. The final curriculum model includes two "integration modules" following the fourth and eighth core courses. The modules focus on the four courses just taken and students are required to successfully complete each integration module before completing additional course work.

Upon completion of the second module, students enter "concentrations" of three electives and the strategy course. As part of the strategy course, an in-house simulation used for over twenty-five years was replaced by "The Business Policy Game: An International Experience" (Cotter and Fritzsche, 1995). Dr. Fritzsche has significantly modified the simulation to accommodate the unique requirements of providing external interventions (Green, McQuaid, and Snow, 2002). Based on extensive experience with simulation in strategy, the faculty decided to use the simulation as a "back bone" to the Integration Modules. The 5th Edition (Cotter and Fritzsche, 2002) was used as a beta test and subsequently adopted. The simulation serves several purposes:

1. It serves as the only business operation the students use in the two integration modules and the strategy course. The repetitive use and familiarity that the students experience with the simulation allow them to focus more aggressively on the external interventions while maintaining focus on running the business.
2. The faculty teams become familiar with the operation of the simulation, its advantages, and its

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shortcomings. Interestingly, due to tremendous support from Dr. Fritzsche, the shortcomings have been significantly minimized.

3. It allows the faculty to develop external interventions for which the results can be operationalized within the confines of the simulation, i.e., the faculty can reward a student team with a strong marketing plan by increasing their advertising effectiveness.

The remainder of this paper discusses the integration modules and ways in which the various disciplines are integrated within the realm of the simulation.

THE INTEGRATION MODULES

Each integration module is structured the same way. There is a two-hour orientation session led by a faculty

Integration Module "A"

- Behavior in Organizations
- Accounting Information and Control Systems
- Political, Regulatory, Ethical, and Legal Issues of Business
- Quantitative and Strategic Decision Analyses for the Firm

In each module, one professor serves as the simulation coordinator and other professors (subject matter professors) represent each respective discipline. The main role of the coordinator is to be very familiar with simulation operation so that the results of external interventions created by discipline professors may be appropriately reflected in the simulated environment. In addition, the coordinator administers the orientation. The role of the discipline professors is to ensure that students address the expectations of their core classes and to observe students' performance during the weekend integration module. The purpose of the simulation is to provide opportunity for the subject matter professors to test students on elements of knowledge from their courses and to observe whether the results of the interventions are reflected in the results of the simulation.

Following the orientation, each team is expected to prepare a plan that addresses the expectations and competencies for the module. The plan is a *business analysis paper* drafted by the team. The maximum length is fifteen pages and it must address:

1. The team's goals for the Integration Module.
2. The team's organization.
3. The team's response to the expectations and competencies described below.

Students submit their papers to the coordinator by e-mail two weeks prior to the Integration Module weekend. The coordinator, in turn, distributes the papers to the subject matter professors for review and grading. Professors

coordinator for all students enrolled in a given module. Approximately four to six weeks later, the teams participate in a weekend activity (Friday 6-10 pm, Saturday 8 am-5 pm) wherein they run the simulated businesses. During the orientation, students self-select teams of four to six members. They are then introduced to simulation functionality with a few trial runs and are given the "expectations by course" for the module. For each core course in a module, the appropriate discipline has identified expectations for which the students are responsible. These expectations, described below in detail, may be intrinsic to the simulation or they may be external interventions to which the students must respond appropriately.

Integration Module "A" occurs after completion of the first four core courses and "B" after the second four courses. The courses contained in each module include:

Integration Module "B"

- Financial Management of the Firm
- Information and Process Systems
- Price Theory and the Competitive Environment
- Marketing Management

provide a composite grade to the students along with pertinent comments.

The students meet on a Friday at 6:00 pm to begin the Integration Module. Instruction for the weekend is provided. Each simulation run represents one quarter, and the time allotted between decisions is approximately one hour. At 10:00 pm Friday night the students are advised that they have the evening to consider the operation of their companies for the next two to three years. At 8:30 am Saturday morning the decisions begin again. The students complete their work around 3:00 pm on Saturday afternoon, after which a debriefing occurs.

The expectations and competencies for each core class are described below. These must be addressed by the students either in their business plan, through interaction with the faculty team during external interventions, or through business performance during the simulation weekend. The expectations and competencies were developed by faculty members from the various disciplines.

INTEGRATION MODULE A: BEHAVIOR IN ORGANIZATIONS

During the simulation students must demonstrate the following by observable behavior and/or by written analysis subsequent to the event:

1. An understanding and awareness of effective group behavior with regard to

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- a. behaviors that lead to increasing the overall effectiveness of each group.
- b. behaviors of each student that could increase or decrease the group's effectiveness.
2. An ability to apply motivational theory to themselves, their team members and the employees of their company.
3. An understanding of the culture of their team, the ways in which it is evolving (or did evolve) and what its particular attributes are that seem positive and negative.
4. An ability to determine leadership behaviors exhibited during the simulation and the extent to which they were effective and why they were effective.
5. An ability to use effective communication skills, including active listening.

INTEGRATION MODULE A: ACCOUNTING INFORMATION AND CONTROL SYSTEMS

Students are expected to demonstrate the following competencies while operating a business in a simulated economy. Students should focus on the profitable operation of a business. These responsibilities focus on internal operations:

1. Management must control the firm's interface with creditors and investors.
 - a. Management must establish control systems to monitor, evaluate, and correct the firm's credit-worthiness both for short-term and long-term obligations. Credit standards (e.g., a minimum numeric value for the current ratio, et al.) shall be stated in the business plan along with a description of management reports that will be used to monitor the firm's credit line and bond issuance ability.
 - b. Management must establish control systems to maintain investor relations and enhance shareholder value. Management should set return (e.g., return on equity, profit margin and asset turnover) and risk (e.g., debt-equity or debt-asset) standards in the business plan and describe the reports that managers will provide to investors that will monitor the firm's investment attractiveness.
2. Management's business plan should state targets for the efficient use of resources:
 - a. **Cash.** A cash budget, in the form of an Excel spreadsheet, shall be devised to project the firm's cash surplus (or deficit) for the near term, i.e., one quarter forward; a projection for an extended term, one year, is desired but not required. A quarterly (or annual) cash budget should utilize a sales projection model developed from methods learned in

Quantitative and Strategic Decision Analyses for the Firm (See below).

- b. **Working Capital.** Management should establish minimum and maximum dollar amounts for cash, receivables, and finished goods inventory.
 - c. **Production Costs.** Management should establish standards for the expected costs of materials, labor, maintenance, and layoffs per unit and as a percent of product price.
 - d. **Operating Costs.** Management should set desired levels of expenditure for administration, advertising, sales expense, research and development, training, and market research each quarter as a percent of sales revenue or portion of unit sales price.
 - e. **Capital Investment.** Management should state a minimum return on assets to be achieved for additional investment in plant facilities beyond the production lines already available.
 - f. **Product Pricing.** Management should state the firm's product pricing policy and describe how pricing shall be monitored and adjusted.
 - g. **Target Sales.** Management should state the level of sales units and the rate of sales growth that will balance investor/creditor needs within the proposed strategy.
 - h. **Revenue & Cost Variances.** The business plan should establish a system of reports that monitors the accumulation of assets (e.g., turnover) and evaluates asset use in comparison to standards (e.g., price and cost variances).
3. Management is responsible for interactive control systems that monitor changes in the economy (GDP, CPI, SMI, CD rate and interest rates) and monitor the competition while searching for opportunities (e.g., product research reports). Informational output should lead to learning, revised cost standards, and opportunistic behavior to trim costs, increase returns or reduce risk.

INTEGRATION MODULE A: POLITICAL, REGULATORY, ETHICAL, AND LEGAL ISSUES OF BUSINESS

Students must demonstrate a working understanding of the legal, regulatory, ethical and political influences impacting the business operation. The focus and expectations will primarily be upon internal operations while at the same time recognizing the irrefutable linkage of outside controls upon said operations. Any or all of the following issues/responsibilities may be addressed:

1. Internal control systems to monitor, evaluate, and implement procedures directed to environmental issues. Such systems will include:

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- a. Business ethics
 - b. Statutory controls
 - c. Regulatory controls
 - d. Case law direction
 - e. Forecasting
2. Forms of business operation (Section 1. a – e incorporated by reference)
 3. Protecting against criminal liability (Section 1. a – e incorporated by reference)
 4. Contractual opportunity/responsibility (Section 1. a – e incorporated by reference)
 5. Product development, opportunity and liability (Section 1. a – e incorporated by reference)
 6. Intellectual property, protection and liability, including but not limited to:
 - a. Copyright
 - b. Patents
 - c. Trademarks (Section 1. a – e incorporated by reference)

Teams will be responsible for interactive processes/procedures that monitor changes in the legal, political and regulatory environment as they interface with opportunity linked to the economy, technology and competition.

INTEGRATION MODULE A: QUANTITATIVE AND STRATEGIC DECISION ANALYSES FOR THE FIRM

Student management teams are to create the following managerial decision tools:

1. Forecasting model -- Create a rolling three-year forecast (based on two prior years of quarterly sales.) The forecast should include trend, business cycle (Real GDP), and seasonal components. The model must be interactive such that each quarter's actual sales may be tracked and appear on the forecast graphs for comparison purposes.
2. Operations flow -- Create a flow chart describing the company supply chain from the introduction of a new model through customer purchase. Specifically focus on inventory management including:
 - a. Timing issues (e.g., one-quarter production prior to availability of new product to customer).
 - b. Flow of inventory through system – illustrate effect of priorities associated with sales order distribution to various regions.
 - c. Sales order priorities (e.g., showing flow based on how sales orders will be filled).
3. Production plan
 - a. Create a rolling one-year (quarterly) MRP plan initially based on forecast in item #1. Minimally, track beginning inventory, production, sales orders, sales (demand), and

ending inventory for each region in which the company operates.

- b. As simulation progresses, revise forecast-to-actual and maintain MRP model for duration of simulation
4. Unit Cost model
 - a. The unit production cost is tracked on one report (Report D, "Production Cost Analysis") and reported by team on another report (Report F2, "Quarterly Industry Report"). Using a similar format to Report D, each team must set up an Excel model that tracks the elements for the unit production cost, the unit selling expenses, and the unit administration expense each quarter for the duration of the simulation.
 - b. The model should indicate the price charged and the profit margin (%) achieved.
 5. Important graphs (Each lettered item below equals one graph.)
 - a. Operations flow charts (These are static; they do not get updated each quarter.)
 - b. Forecast/Actual sales/Capacity versus quarter.
 - c. GDP/CPI/Real GDP/stock market (primary axis) and unit sales (secondary axis) versus quarter.
 - d. Percent cash flow (Use a 100 percent stacked area chart in Excel) from operations, finance, and investment receipts (based on Report B) per quarter.

The above items are graded based on their functionality, the degree to which they address the requirement, their capability of being updated quarterly, and the ease of demonstration to the Board of Directors (faculty). Of particular interest will be the ability of the company management (students) to identify when these models signal issues. While students may refer to or use portions of the spreadsheets provided with the simulation software, these do not specifically address the issues requested above.

INTEGRATION MODULE B: FINANCIAL MANAGEMENT OF THE FIRM

Student management teams are expected to have a foundational knowledge of, and the ability to apply, analytical skills to solving problems related to the following managerial decisions:

1. Investment Decisions:
 - a. Management teams must be able to explain the fundamentals of value creation.
 - b. Management teams must be able to calculate accurately their firm's cost of capital and expected returns on investment decisions.
 - c. Management teams are expected to be able to explain how their investment decisions enable

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- them to execute predetermined corporate strategies.
2. Financing Decisions:
 - a. Management teams must be able to defend their capital structure decisions from a maximization-of-shareholder-wealth perspective.
 - b. Management teams are expected to understand and explain the consequences of leverage in the capital structure, and how it relates to profitability and investor returns.
 - c. Management teams must be able to utilize equity issues at appropriate times to maximize shareholder wealth. To issue equity, management must convince the board of directors that the issue is in the best interest of the shareholders.
 - d. Management teams are expected to provide justification for financial choices related to debt instruments. For example, if a bank loan is sought, managers must demonstrate to the bank that they are credit worthy and able to make interest payments and retire the debt in a timely manner.
 3. Dividend Policy -- Management teams are expected to develop appropriate distribution policies for excess cash. Specifically, managers are expected to be able to determine the difference between dividends and share repurchases, and to explain when each is appropriate. To do this, management must determine, and be able to explain, how much cash is necessary for on-going operations.

In order to meet these expectations and duties, pro forma financial statements should be developed prior to the simulation and maintained throughout the course of the simulation.

INTEGRATION MODULE B: INFORMATION AND PROCESS SYSTEMS

In this module students examine production processes and service delivery processes, their different information requirements, and the critical role of information systems in supporting them. They explore how businesses apply information technologies to improve the vital functions of information gathering, information processing, and information sharing. They also deal with the application of IT to automate, streamline, re-engineer, and integrate business processes to enable advances such as mass customization, quality management, supply chain management, and knowledge management. In particular, students are expected to:

1. Become familiar with the range of business processes that must be effectively managed for success.

2. Learn the many types of information systems supporting business processes and the specific ways they can help improve responsiveness and productivity.
3. Learn the potential pitfalls of information systems in both application and implementation.
4. Learn how information systems influence business functions such as accounting, finance, marketing, human resources, manufacturing, as well as organizational behavior and culture.

In the Integration Module the focus and expectations are primarily upon applying these skills to the processes and decisions represented in the simulation, as well as on enhancing the business information acquired in the simulation. Any or all of the following issues/responsibilities may be addressed:

1. Students should be able to use the simulation's information system to effectively support team decision-making.
2. Students should be able to make specific recommendations regarding ways the simulation's information system could be improved. Suggestions could improve information content, flow, quality, presentation, or any other aspect of the IS.
3. Students should be able to create Excel models to make forecasts or to perform what-if analyses on simulation variables.
4. Students should be able to present a feasible e-commerce proposal for their simulated business and discuss ways in which it might impact specific simulation variables.
5. Students should be able to use the Internet to gather data that will assist them in dealing with interventions, as well as in carrying out their regular operations.

INTEGRATION MODULE B: PRICE THEORY & THE COMPETITIVE ENVIRONMENT

During the Integration Module students are responsible for demonstrating their competence by appropriately responding to the following issues:

1. In order to remain competitive in today's dynamic marketplace, it is imperative that management appreciates the fact that it must focus on the external environmental "drivers" that directly influence the firm's revenue stream. The determinants of economic demand include, among other things, consumer preferences for a particular product, consumer income, and consumer expectations for the immediate future. Because these determinants are linked to the vagaries of the macro economy, they often will actually position the demand curve (alter elasticity of demand) for a firm.

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2. Because the macro environment directly influences a firm's resource costs and revenues, it therefore also affects the marketing and financial planning. For this exercise, the expected observable outcome measures are appropriate responses to the following specific questions:
 - a. What is the estimated price elasticity of demand for the products being sold in this simulation? Does this elasticity estimate differ at various points in the business cycle?
 - b. How much of an influence does the business cycle have on the elasticity estimates and how does this influence, if at all, the firm's overall business thinking?
 - c. How and to what degree do the varying macro economic indicators, such as GDP, inflation, and interest rates, influence the firm's overall business thinking about the simulation outcome?

INTEGRATION MODULE B: MARKETING MANAGEMENT

At the strategic level, students will be expected to demonstrate:

1. Ways in which customer demand is impacted by two sets of variables:
 - a. Controllable variables such as advertising, price, and sales commissions;
 - b. Uncontrollable variables such as economic activity, exogenous events, or competitive decisions.
2. Ways to account for segments that exhibit different sensitivities to the controllable variables.
3. The finite value of market research
4. Ways to balance generation of a marketing strategy that shows consistency against adapting to changes in the uncontrollable environment.
5. Methods for anticipating competitive decisions.

At the tactical level, students will be expected to demonstrate:

1. Ways to create a consistent set of price, quality and advertising decisions.
2. Recognition of the limits of price-based competition.
3. Development of the qualitative aspects of a promotional campaign (e.g. clear target, appropriate message and media choices, etc.).
4. Ability to manage the sales force compensation program.
5. Incorporation of adjustments to marketing campaigns that are unique to foreign cultures.

The simulation connected with the final strategic management course completes the use of the simulations and the Integration Modules. The same simulation is used, although a foreign area is introduced along with the interventions described in our previous paper (Green, et al,

2002). This simulation takes place after three elective courses have been completed and is conducted in connection with the strategic management course.

CONCLUSIONS

Our experience over the last two years has proved positive in terms of student response and faculty integration. Prior to the curriculum redesign, students were only exposed to the simulation near the end of their capstone strategy class. Because of differing faculty capabilities in delivering the simulation and its relevance to their class objectives, the simulation experience varied substantially in breadth, depth, and value. By "standardizing" the experience through defined expectations and competencies, creating the Coordinator role, and using the simulation to integrate diverse content areas, the integration experience is much richer for the students and is comparable across the entire student population. By using the same simulation program to facilitate the integration experience, the students gain some level of familiarity and an improved understanding of ways in which the environment impacts business, how their own actions and those of their competitors can impact their business, and ways to deal with the external interventions while managing the business.

From the faculty perspective, the simulation has created a more collegial environment. For example, a professor may now feel comfortable asking a colleague exactly what is taught in his or her class. Observing the interventions of other disciplines has made evident several opportunities for integration between disciplines that would not have otherwise been considered. For example, the impact of an environmental violation (or better yet, a potential environmental violation) has legal, ethical, accounting, and marketing overtones. By introducing one intervention, several disciplines play their angles with the student teams and push ambiguity to new levels. In addition, the interaction between finance and economics becomes very clear when teams consider financing growth and must explain their financing plans from multiple perspectives. The goal to integrate the students' experience has created an opportunity for the faculty to integrate their own knowledge and take it back to their classrooms very effectively.

The simulation has been an effective vehicle for integration chiefly because students must accept the consequences of their own decisions and actions in a simulated business environment. At the same time, the simulation is also an excellent tool to assist students to recognize the very direct impact that the typical "silo-oriented" disciplines actually have on one another.

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