

MEASURING MBA LEARNING OUTCOMES USING BUSINESS SIMULATIONS

Owen P. Hall, Jr.

Pepperdine University
Graziadio School of Business & Management
Malibu, CA 90245
ohall@pepperdine.edu

Ken Ko

Pepperdine University
Graziadio School of Business & Management
Malibu, CA 90245
Kenneth.Ko@pepperdine.edu

ABSTRACT

Business schools are under increased pressure from the marketplace to make curriculum more relevant and timely. For AACSB accredited b-schools there is also the requirement to provide learning assurance. Simulations, which are used extensively throughout most MBA programs, provide one approach for evaluating the effectiveness of curriculum design and delivery. The purpose of this paper is to illustrate how business simulations can be used to evaluate assessment rubrics for MBA type programs. A prototype scoring rubric was evaluated using a standard business simulation. The results from an initial survey of students having completed the business simulation show that 80% of the student teams either met or exceeded expectations as measured by the prototype rubric.

Keywords: Rubrics, learning outcomes, simulation, MBA.

Introduction

The demand for managers who can compete in the expanding global marketplace is growing rapidly. As a result many managers are returning to the classroom. The student/manager is interested in a practical program of study that focuses on results and provides convenient schedules and learning venues. These dynamics call for new and innovative systems for providing management education. AACSB has also recognized the changing dynamics of global business. The AACSB “new” learning assurance philosophy can be characterized as follows (Miles, 2004):

“Schools should assume great flexibility in fashioning curricula to meet their missions... Accreditation does not mandate any particular set of courses...Contents of the learning experiences provided by programs should be both current and relevant to needs of business and management positions.”

Flexibility is a key ingredient in this “new” philosophy. Nevertheless, learning assessment does require a systematic evaluation approach. The overall approach consists of establishing basic

learning goals, as outlined above, formulating precise objectives for each goal, defining specific rubrics (measurement categories) for each objective, assessing student performance against each rubric (Zhu, 2005). This assessment then serves as a vehicle for continually improving both curriculum content and delivery. The learning goals can also be modified based on the assessment findings. This final step provides for a self correcting feedback process. Table 1 presents an example goal and set of objectives for the strategic learning perspective.

Table 1 - Example MBA Learning Goal & Objectives

| | |
|---|--|
| Goal #1: Students have the skills to develop an integrated, multi-disciplinary approach to business decision-making. | |
| Objective 1 | Students' recommendations and plans will incorporate relevant economic, social, technological and political trends that demonstrate a holistic awareness of contemporary business. |
| Objective 2 | Students will be able to engage in multi-disciplinary problem solving using a variety of decision analysis systems. |
| Objective 3 | Students will be able to develop and justify strategic recommendations that indicate the integration of a variety of business functions or disciplines. |

Similar goals and objectives would be developed for each of the program learning targets. Two to four objectives are typically developed for each goal. Rubrics are at the heart of the learning assessment process (Ammons, 2005). A scoring rubric is a set of categories that is used to record the assessed performance for a given learning experience or assignment (Moskal, 2000). Business simulations represent one vehicle for evaluating a scoring rubric in a b-school environment. Typically, business simulations are used extensively throughout most MBA programs (McKone, 2003). Business simulations have been found to be particularly effective in developing both individual and team management skills (Aquino, 2005). Recent evidence continues to show that students engaged in simulations retain about 75% of the instructional content compared to 5% for lectures, 20% for audio-visual presentations, and 50% for discussion groups (Johns, 2003).

Simulations provide the opportunity to measure student learning both in terms of direct measures (e.g., earnings) as well as indirect measures (e.g., planning and team work). Table 2 presents an example scoring rubric template for use with a strategic business simulation. The template identifies the learning goal and its corresponding objectives. Associated with each objective is a rubric which, in this case, consists of a three point scale. The focus of the first rubric is on the quality and completeness of the business plan. Specific assessment parameters include the quality of the mission statement and the articulation of the business strategy (e.g., premium price point). The second rubric addresses the ongoing decision-making process. This evaluation also includes the use of specific quantitative systems to support the decision-making process (e.g., forecasting).

The third rubric concentrates on the board of directors meeting (BDM). The supervising simulation faculty would serve as the outside board members. The BDM presentation should provide the logic behind the current business plan and the rationale for any proposed changes. The PowerPoint slide show should clearly identify the firm's present status including specific

challenges. This presentation should also include a comparison of actual performance with the performance targets identified in objective #1 (e.g., stock price growth).

Table 2 – Prototype Rubric Template for Goal #1

| Rubric | Metric | Poor(1) | Good(2) | Excellent(3) |
|---------------|-----------------------------------|----------------|----------------|---------------------|
| 1 | Simulation Business Plan | | | |
| | Mission Statement + Goals | 0 | 0 | 0 |
| | Overall Strategy | 0 | 0 | 0 |
| | Tactical Analysis | 0 | 0 | 0 |
| 2 | Decision-making Systems | | | |
| | Operations | 0 | 0 | 0 |
| | Marketing | 0 | 0 | 0 |
| | Financial | 0 | 0 | 0 |
| 3 | Board of Directors Meeting | | | |
| | Plan Rationale | 0 | 0 | 0 |
| | Presentation Quality | 0 | 0 | 0 |
| | Q&A | 0 | 0 | 0 |

The third rubric concentrates on the board of directors meeting (BDM). The supervising simulation faculty would serve as the outside board members. The BDM presentation should provide the logic behind the current business plan and the rationale for any proposed changes. The PowerPoint slide show should clearly identify the firm’s present status including specific challenges. This presentation should also include a comparison of actual performance with the performance targets identified in objective #1 (e.g., stock price growth).

Table 3 shows the overall scoring assessment scheme. Typically, performance falling in the “below expectations” category calls for corrective action. However, it should be pointed out that the learning assurance paradigm is based on the principle of “continuous improvement” at all levels of learning achievement.

Table 3 - Scoring Assessment

| Overall Score | Assessment |
|----------------------|----------------------|
| 23 - 27 | Exceeds Expectations |
| 18 - 22 | Meets Expectations |
| 9 - 17 | Below Expectations |

Table 4 illustrates the action process for learning Goal #1 for students with scores below 18. In this example, the focus is on improving the student teams’ abilities to prepare and execute a strategically oriented business plan.

Table 4 – Assessment Response of Goal #1

| | |
|----------------------|---|
| Goal #1 | Students have the skills to develop an integrated, multi-disciplinary approach to business decision-making. |
| Rubrics Scoring | Scores below 18 |
| Specific Findings | Students fail to appreciate the integrative nature of business and fail to properly respond to changing simulation outcomes. |
| Learning Strategies | Increase focus on developing an integrated business plan. |
| External Experiences | Identify specific online resources and testimonials regarding business plan development. |

The developed rubric for Goal #1 was analytically evaluated using the Business Policy Game (Cotter, 2002). The results from this initial benchmarking process are presented in the following section.

Rubrics Assessment

The Business Policy Game (BPG) was used to test the prototype rubric on four distinct MBA sections. Two sections had reached the halfway point in the curriculum while the other two were near graduation (capstone). The benchmarking sample size was 66. Since the purpose of this exercise was to perform an initial assessment of both the rubric and data recording systems student teams were used as the measuring unit. Ultimately, the process will transition to measure individual student performance, which is required by AACSB standards, using the developed simulation based assessment process. Faculty based assessment data was recorded on each of the three learning objectives using a one to three scale. Additionally, two representative financial assessment parameters, stock price and debt/equity ratio, were logged at the end of the simulation along with the simulation timeframe (midpoint or capstone). These two financial parameters are frequently employed in measuring overall company effectiveness within the game structure (Wolfe, 2005). Recording financial performance parameters as part of the assessment process can serve in at least two capacities: 1) To provide independent validation of the rubric evaluation; 2) To estimate values for “missing” data.

Table 5 provides descriptive statistics for the variables used in the preliminary rubrics assessment. For example, 80% of the team evaluations either met or exceeded the minimum rubric standard of 18.

Table 5 – Selected Descriptive Statistics

| Variable | Mean | S.D. |
|--|-------------|-------------|
| Capstone Level (%) | 41 | - |
| Debt Equity (D/E) | 0.16 | 0.15 |
| Stock Price (SP) | 9.5 | 10.6 |
| Average Total Score | 20.0 | 3.79 |
| Meets or Exceeds Expectations (%) | 80 | - |

Also notice the very large standard deviations for both debt-to-equity and stock price. These statistics simply illustrate the fact that some teams performed well while others did not. Table 6 presents zero-order correlation coefficients for the database.

Table 6 - Correlation Matrix Results

| | Level | D/E | SP | Score |
|-------|--------------|---------------|--------------|----------|
| Level | 1 | | | |
| D/E | 0.09 | 1 | | |
| SP | 0.29* | -0.50* | 1 | |
| Score | -0.05 | -0.44* | 0.32* | 1 |

*Significant at 0.05

This correlation data revealed among other things:

- Student teams at the capstone level had a statistically significantly higher stock price score than those at the midpoint level ($r=0.29$, $p = 0.01$).
- Debt-to-equity ($r=-0.44$, $p=0.01$) and stock price ($r=0.32$, $p=0.01$) are both statistically related to total rubrics score.

Figure 1 shows a scatter plot of stock price versus total score. The database was more fully explored using both stepwise multiple regression (SMR) and neural net analysis where the target (dependent) variable was total rubrics score. The SMR revealed that debt-to-equity was the only statistically significant variate when taken in combination with the total independent variable set. The corresponding COD was 0.20. The neural net analysis yielded a COD of 0.38 or nearly twice the value from the SMR. Neural networks (NN) have seen increased use in educational applications since the underlying relationships between variables are somewhat ill defined as in the case of student learning (Gonzalez, 2002). Classification analysis represents an important variation to the standard neural net predictor model. Here the performance of each student can be classified (below expectations, meets expectations, above expectations) based on a set of predictor variables. Again the purpose of using a neural net classifier in this way would be to independently validate the rubric’s accuracy and to help fill in missing data.

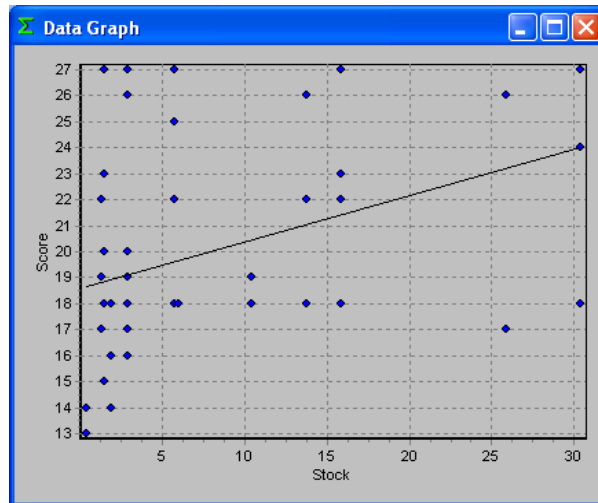


Figure 1 - Total Score versus Stock Price ($r = 0.32$, $p=0.01$)

The use of simulation for rubrics assessment is not limited exclusively to capstone or team oriented events (Romnie, 2003). Simulation can also be used to support the learning assurance process over a wide venue or learning requirements. Presented in the following is the complete set of scoring rubrics that will be used in the prototype MBA program learning assessment process.

- Goal 1: Students have the skills to develop an integrated, multi-disciplinary approach to business decision-making.
- Goal 2: Students have the skills necessary to analyze business situations and recommend solutions.
- Goal 3: Students have the communication skills to persuasively and professionally articulate their thinking.
- Goal 4: Students understand team dynamics and are effective team players and leaders.
- Goal 5: Students incorporate ethical considerations in decision-making.

Clearly, many of these rubrics lend themselves to assessment using simulation in concert with the attended business plan (Drost, 2001).

Conclusions

“Quality assurance” is defined as the process by which the educational institution measures learning outcomes against a set of specific goal and objectives. AACSB’s “new” guidelines are extremely flexible and thus provide for a school specific assessment strategy. The overall assurance process consists of setting learning goals, establishing objectives and defining measurable rubrics. A scoring rubric is a set of categories that is used to record the assessed performance for a given learning experience or assignment. Simulations (strategic and discipline based) can be used as a vehicle for measuring learning outcomes employing scoring rubrics. Simulations provide the opportunity to measure student learning both in terms of direct measures as well as indirect measures.

The purpose of this paper was to evaluate the effectiveness of a prototype scoring rubric using simulation as part of an overall learning assessment process for a MBA program. The results

from an initial survey of students having completed a business simulation show that 80% of the student teams either met or exceeded expectations. The data also revealed a statistical correlation between two key financial parameters (stock price and debt/equity) and the total rubrics score. A number of issues were encountered during the course of this test. These included the short timeframe available for faculty members to evaluate each board of director's presentation and the potential for not all participating faculty to participate in all phases of the rubrics scoring due to other requirements associated with managing the simulation. The next stage in this assessment process is to transition to individual student performance measurement and to establish an Internet based data system to facilitate the recording of the measurement data. The evaluation of individual student learning outcomes can be assessed at both the business plan preparation phase and at the board of directors meeting. Since the number of students passing through most MBA programs can be quite large, a sampling strategy can be employed. Lastly, evaluating student learning outcomes at the curriculum midpoint via the simulation based rubric provides a vehicle for enhancing the learning process prior to the final assessment at the capstone strategy course.

REFERENCES

- Ammons, J.; Mills, S. 2005. Course-embedded assessments for evaluating course-functional integration & improving the teaching-learning process. *Issues of Accounting Education*, 20, (1) 1.
- Aquino, K.; Serva, M. 2005. Using a dual role assessment to improve group dynamics and performance. *Journal of Management Education*, 29 (1), 17.
- Cotter, R.; Fritzsche, D. 2002. *The Business Policy Game: An International Simulation (5th Edition)*, Prentice Hall.
- Drost, D.; Chaney, J. 2001. Core course outcome assessment and program continuous improvement using integrative business plan: an empirical evaluation. *Developments in Business Simulation and Experiential Learning*, 28, 42.
- Gonzalez, J. 2002. Artificial neural networks: A new approach to predicting application behavior. *Research in Higher Education*, 43 (2), 235.
- Johne, M., 2003. Virtual environments. *CMA Management*, 76 (10), 28.
- McKone, K.; Bozewicz, J. 2003. The ISM simulation: Teaching integrated management concepts. *Journal of Management Education*, 27 (4), 497.
- Miles, M.; Hazeldine, M.; Munila, L. 2004. The 2003 AACSB Accreditation Standards and implication for business faculty: A short note. *Journal of Education for Business*, 80 (1), 29.
- Moskal, B. 2000. Scoring rubrics: what, when and how? *Practical Assessment, Research & Evaluation*, 7 (3).
- Rommie, G. 2003. Learning outcomes of microworlds for management education. *Management Learning*, 34 (1), 51.
- Wolfe, J.; Sauaia, A. 2005. The Tobin q as business game performance indicator. *Simulation & Gaming*, 36 (2), 238.
- Zhu, F.; McFarland, D. 2005. Towards assurance of learning in business programs: Components and measurements. *Journal of American Academy*, 7 (2), 68.