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Coaching and Business Simulations: A Formula for Success?

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ABSTRACT

This research studies the affect of coaching on student's success in a simple, off-the-shelf, business simulation. Data was collected and analyzed from an undergraduate Business Research class at a small, private, 4-year university. The data, most likely because of the small sample size, did not fully support the expected findings that students would benefit from coaching on strategy, which would result in higher levels of performance on an off-the-shelf business simulator. However, strong correlations were found between the self-stated familiarity with similar games and results in the simulation. The research and results that support these findings are presented and discussed.

KEY WORDS: BUSINESS SIMULATION; COACHING; MANAGEMENT; TRAINING; HIGHER EDUCATION; TEACHING, BUSINESS SCHOOL

INTRODUCTION

This paper explores the relationship between coaching and business simulations to determine if students exposed to strategy coaching will be more successful in an off-the-shelf business simulation. There is much support in industry for a "blended" approach (using more than method) to teaching business principles. Every year, Training magazine highlights 100 best practices from industry by listing formal programs that have been deemed to be innovative and/or successful. In 2003, one of Training magazine's 100 best practices included a best practice in First-Line Supervisor Development (Schettler, 2003). The winner was IBM, who in 2001, trained 5,431 new managers, located around the world, in their Basic Blue for Managers training program (it is a blended learning program for first-line supervisors). IBM's approach is that training is an extended process rather than an event, and IBM immerses managers in yearlong program that is a combination of online self-study, simulations, competency assessments, management coaching and classroom experiences. The intent of IBM is to utilize a comprehensive training program that emphasizes 'doing' while learning (e.g., simulations) and continuous feedback during performance (e.g., coaching) to maximize the utility of the training. The goal is to teach first-line managers to become better people managers while aligning their work outcomes with IBM's strategic focus. IBM estimates that first-year business gains due to leadership skill improvements, purportedly from the training program, average $450,000 per employee (Schettler, 2003). In addition, Mihaliak and Reilly (2001) in an article for Best's Review state that "Online training courses, system-based coaching and business-simulation programs can save companies time and money." They suggest that for modern businesses training is more than just a business expense, it is a creator of value. The article gives examples of organizations that have implemented new learning technologies (such as business simulations) that have reduced learning curves, increased speed to competency, implemented best practices, leveraged managers' time and reduced costs compared to traditional classroom teaching methods. In addition, Mihaliak and Reilly (2001) suggest that "Achieving results like these requires managers to blend appropriate learning technologies and strategies." The three strategies they elaborate on are to shift expertise to intelligent mission-critical systems, use enhanced learning techniques and provide learning at point of need (Mihaliak and Reilly, 2001). Many industry practitioners recognize that a blended learning environment is the most effective method for changing the behavior of employees. One author Maise (1998), suggests that the following 4 methods be used to ensure this behavior change: coaching, assessment, simulation, and prescriptive learning. In addition, the suggestion is made to focus on the amount of change required and the methods used to change behavior, rather than just the information content of the course.

The belief of this researcher, as well as many others (see Thompson, Purdy and Fandt, 1997) is that these strategies and learning technologies are highly effective in training undergraduate students in higher education settings as well as industry practitioners. As stated in a relevant article about business simulations in management training:

> *Virtual business simulations are a form of combative training in which students pit their business skills against those of formidable opponents under the watchful eye of a training coach. This [author] advocates the inclusion of large-scale, virtual-reality simulations in the training of future managers. …they can help students develop an almost intuitive understanding of business, including a seamless perspective of its functional elements and a knowledge of how these elements can be coordinated to achieve a strong and profitable position in the market (Cadotte, 1995).*

The advantages of simulations, over traditional pedagogical methods, have been researched in many industry training and higher educational settings. Particularly in management training, "they offer a fairly realistic model of the interdependence of decisions that managers make in an organizational setting" (Thompson, Purdy and Fandt, 1997). A simulation is defined in this study as "an experiential learning

exercise in which students practice the design, implementation, and control of business strategies" (Cadotte, 1995). However, as mentioned in several of the articles above, a simulation utilized as a training tool by itself, is not as effective as it is in a blended learning environment. When you evaluate some of the skills that simulations are most commonly thought to develop, critical and strategic thinking skills, it is well documented that these skills need a great deal of practice, feedback from a subject-matter-expert (SME), and coaching to develop (Thompson, Purdy and Fandt, 1997). The idea of coaching, as used in this article is more similar to what exists in corporate environments than in a traditional educational setting. That is, an attempt by a SME to share expertise that is relevant to the tasks being performed, combined with other enhanced learning techniques and providing learning just-in-time (JIT), at exact at point of need of the learner. The role of a coach is described by Cadotte as a person to "help students develop critical thinking skills" and "[ask questions] during executive briefings [that] should stimulate students to consider additional dimensions in their strategic thinking" (1995). The suggestion of this author is the inclusion of coaching in a simulation-based training strategy may not only be helpful but necessary for superior learning to take place. This is supported by other researchers who state the following "[Simulations] change the focus of the class from teacher oriented to student oriented by shifting the emphasis from the teaching of the instructor to the learning of the student" (Thompson, Purdy and Fandt, 1997) and "[the coach's role] comes at a highly relevant time and within a context that is germane for and unique to each student." (Cadotte, 1995).

FURTHER RESEARCH

Researchers suggest that a "business school should strongly stimulate autonomous learning (i.e. a sideline or coaching role for the teacher), peer-to-peer learning, team based learning, experiential learning, and learning through the use of technology" (Moratis and van Baalen, 2002). These authors also point out that in order to promote this the business school should upgrade their management-learning environment so that they can run various technological applications such as: content resources, exploration- and experience-based learning (like simulations and games), community-based learning technologies, and applications that allow for contact between students and faculty as well as interaction among students. These are aspects of what the authors refer to as a networked (Moratis and van Baalen, 2002) or Synolic (from the Greek word "synolos", meaning complete or all together) business school (van Baalen and Leijnse, 1995). Typically, as mentioned above they will use a variety of interdisciplinary, action-oriented pedagogical approaches and new methodologies such as experiential or project-based teaching (Vequist, 2003).

METHODS AND MATERIALS

In this study, 4 students participated in an off-the-shelf business simulation for partial class credit (see Figure #1 below). The business simulation used was Big Biz Tycoon 2 (Released in 2003 by 4Head Studios and Activision), which was run on a standard PC (Intel Pentium III and Windows 2000 OS). In this simulation, the students hire/fire/train/manage employees (employees varied on their level of constitution, production, intelligence, creativity, charisma and loyalty, these can be increased through training and these levels also determine what tasks can be performed by the employee), purchase office equipment/fixtures to meet employee needs (if equipment is available or not available, it will affect the employee's competencies), research new products (the students were instructed to focus on children's toys), produce products (based on the competencies of the employees assigned to this task), advertise products to increase their price (again based on the competencies of the employees assigned to this task) and sell the products (can be set to automatic distribution). In addition, there are also options to invest profits to earn finance revenue, take out business loans for capital investments, buy additional properties and interact with competitors by headhunting, spying or sabotage (Note: these options were not utilized by the students due to the time allowed for the study). The game was played independently across players.

Figure 1- Screen Print of Office Layout for Big Biz Tycoon 2

All students started with the same base setup- beginner level of difficulty, free game (New York, U.S. is corporate headquarters with the opportunity to expand to Hamburg, Germany or Tokyo, Japan), 1 employee, $50,000 start-up money and no furniture or products. All students were sent the game manual at least a day before the study and all students were given a 15 minute 'training session' on the navigational icons and general game play. All students then participated in game play for 45 minutes. The students were assigned to either the research or control group (2 in each group) based on their self-professed level of familiarity (2 familiar and 2 not familiar) with similar games (thus students were assigned to either the research and control group in matched sets). The research group differed from the control group in that the research group students were given coaching on strategy to 'assist' them during the performance of the simulation.

Students that were assigned to the research group received Human Capital Management strategy coaching to assist them throughout the simulation. The student received individual coaching that was given to them as they participated in the game. The time spent coaching the individual student depended on the communication between the coach and the player and the observations of the coach. The coach did not suggest specific actions but suggested general 'themes' that revolved around maximizing the human capital of the business. The coaching strategy utilized was similar to the applied practice of "management by walking around" or MBWA.

The types of advice that was given depended on the tact the student took and the situations the student found themselves in, however the coaching focused on the following areas:

- Your employees are the core competency of your business
- Hire/Assign your employees based on their competencies
- Managing your employees is your most important responsibility
- Treat your employees well and they will perform better for you
- Continuing education of your employees will benefit the organization
- Teamwork allows an organization to be more productive

The students were undergraduate students of a small, private 4-year southwestern, university taking a Business Research class (with primarily 3rd or 4th year students). 4 members (2 females and 2 males) of the class voluntarily elected to perform in this study for partial class credit. Their performance on the simulation did not affect the credit they received in the class. Of the 4 students, 2 self-reported that they were very familiar with

similar simulation games (the 2 males) and 2 reported that they were unfamiliar with such games (the 2 females).

The criteria by which student success in the simulator was measured was based on the outcomes reported by the simulator. They varied from measures of production, sales, advertising and organizational demographics. The criteria that were chosen to be evaluated, in this study, were similar to metrics that a practitioner (such as a small business owner) might use to determine the 'success' of their business. See the criteria in the table below:

Table 1. Criteria for the Study

Criterion #	Criteria
1.	Level of item researched (up to 6 levels of toys are available to be researched)
2.	Items produced and maintained in inventory (these can be in different levels- see 1 above)
3.	The price an items sells for (this is affected by advertising and these can be in different levels- see 1 above)
4.	Salaries of the employees
5.	Sum of all overhead costs
6.	Ranking (ranking among the 6 competing firms- 5 are computer run)
7.	Cash reserves (the player starts out with $50,000)
8.	# of Employees
9.	Sales (at the end of 2 weeks- all players did not fully finish 2 weeks in the simulation because of the time spent [45 minutes])

RESULTS

The data that was reported was the student's scores on the 9 criteria mentioned above. The author collected the data from the completed and saved games of the students. The data was collected after the students were asked to stop game play (45 minute period) and after all current game activities were stopped (e.g., many times the students had begun to research a new product or production of a current product was ongoing). Credit on the criteria, previously mentioned, was given for only completed items or tasks (e.g., if research on a new product was ongoing, that product was not counted in the data unless it was 100% complete by the end of game play).

A Microsoft Excel (version 2000) spreadsheet was utilized to collect and analyze the data. For the first analysis, the scores of the first 3 criteria were reported and correlations and T-tests (one tailed, two sample-equal variance) to test the differences between the Control and Research groups.

Table 2. Results of the Study (first 3 criteria)

Subject ID	Group	Game Familiarity	Level of Product Researched	# of Product Level 1 in Inventory	# of Product Level 2 in Inventory	# of Product Level 3 in Inventory	Price of Product-Level 1	Price of Product-Level 2	Price of Product-Level 3
C1	Control	Low	1	0	0	0	83	NA	NA
C2	Control	High	2	0	0	0	38	26	NA
R1	Research	Low	2	16	1	0	41	76	NA
R2	Research	High	3	0	0	0	41	64	137
Correlation w/Exp Grp			**0.7071**	**0.5774**	**0.5774**	**NA**	**-0.5225**	**0.9732**	**0.5774**
T-Test w/Exp Grp			**0.1464**	**0.2113**	**0.2113**	**NA**	**0.2387**	**<0.02***	**NA**

* Projected based on correlation without missing data, significant at the .05 level

The correlation between level of product researched (there are 6 possible levels) and group membership did approach significance (with the Research having slightly higher levels of product researched). It can be argued that given a larger sample size this difference could have been significant. Only 1 significant correlation was found and that was the price of the 2nd level of product (in the simulator it was Toys: Soccer Ball). However, 1 of the Control group members was unable to achieve the 2nd level of product (the first was Toys: Teddy Bear) and this exaggerated the correlation. However, there does seem to be a trend of higher achievement (as mentioned in the first finding) and even possibly price on the 2nd level of products that correlates with being in the Research group.

Table 3. Results of the Study (last 6 criteria)

Subject ID	Group	Game Familiarity	Total Salaries	Sum of Overhead Costs	Overall Ranking	Cash reserves	# of Employees	Total Sales
C1	Control	Low	844	1408	4	41818	3	707
C2	Control	High	2260	3433	2	33122	8	1921
R1	Research	Low	1127	2584	3	38937	4	1916
R2	Research	High	2058	2854	2	14261	7	6053
Correlation w/Exp Grp			**0.0338**	**0.2024**	**-0.3015**	**-0.5066**	**0.0000**	**0.6589**
T-Test w/Exp Grp			**0.4831**	**0.3988**	**0.3492**	**0.2467**	**0.5000**	**0.1705**

The expected results would have been supported by a finding of a significant correlation between Total Sales and Group membership. However, the correlation approached significance but fell short most likely because of sample size. There did seem to be a definite trend of the Research group having higher overall sales than the Control group but this could be explained by other phenomenon (such as the Hawthorne affect) than the coaching the students received. Another somewhat interesting finding is that the cash reserves of the Research group seem to be overall lower (the correlation is high [-.50] but not significant) than the Control group. Perhaps, the coaching strategy of 'treating your employees right' may have led to a increase in buying behavior to meet the 'needs' of the employees (more office furniture and fixtures).

Based on the matched pairs sample that the author had utilized because of the presence of 2 students who were familiar with this type of simulation game, an analysis of the differences caused by simulation familiarity was undertaken. The following results were found:

Table 4. Additional Results of the Study (first 3 criteria)

Subject ID	Group	Game Familiarity	Level of Product Researched	# of Product Level 1 in Inventory	# of Product Level 2 in Inventory	# of Product Level 3 in Inventory	Price of Product-Level 1	Price of Product-Level 2	Price of Product-Level 3
C1	Control	Low	1	0	0	0	83	NA	NA
R1	Research	Low	2	16	1	0	41	76	NA
C2	Control	High	2	0	0	0	38	26	NA
R2	Research	High	3	0	0	0	41	64	137
Correlation w/Fam Grp			**0.7071**	**-0.5774**	**-0.5774**	**NA**	**-0.6029**	**0.1157**	**0.5774**
T-Test w/Fam Grp			**0.1464**	**0.2113**	**0.2113**	**NA**	**0.1985**	**NA**	**NA**

As shown by the results above, the student's self-reported familiarity with simulation games did seem to have an impact on the level of product that they reached in the game (correlation is high [.70] but not significant). This would be expected because it would be assumed that the students would be able to respond quicker in the simulated environment and thus be more successful in reaching milestones faster.

Table 5. Additional Results of the Study (last 6 criteria)

Subject ID	Group	Game Familiarity	Total Salaries	Sum of Overhead Costs	Overall Ranking	Cash reserves	# of Employees	Total Sales
C1	Control	Low	844	1408	4	41818	3	707
R1	Research	Low	1127	2584	3	38937	4	1916
C2	Control	High	2260	3433	2	33122	8	1921
R2	Research	High	2058	2854	2	14261	7	6053
Correlation w/Fam Grp			**0.9788**	**0.7779**	**-0.9045**	**-0.7776**	**0.9701**	**0.6601**
T-Test w/Fam Grp			**0.0106***	**0.1110**	**0.0477***	**0.1112**	**0.0149***	**0.1699**

* Significant at the .05 level

There were 3 correlations that resulted in significance when the familiarity with simulation games was analyzed. Two of these correlations were highly interlinked- Total Salaries and # of Employees. Both of these correlations (.9788 and .9701 respectively) were significant at the .05 level. Again, like the previous finding, it is suggested that student's who are more familiar with this modality are more likely to navigate the game quicker and thus achieve 'better' results. The other correlation that was significant was the overall ranking (-.90, $p<.05$), this was the correlation that would have supported the expected findings if it had been a correlation with Group membership. Instead however, it appears that familiarity with this genre of games is more important to success in this game that the coaching that was received.

DISCUSSION

Overall, it would seem that the students in the Research group who received business strategy coaching did not seem to perform at a significantly higher level than the students in the Control group who did not receive any coaching. There did seem to be some trends that indicated there could be significant findings if the sample size was larger. Findings similar to what was suggested by IBM (5,431 new managers trained and average savings of $450,000 per employee) are far beyond the reach of this simple analysis (Schettler, 2003). It is disappointing that the addition of coaching did not have a stronger effect on the student's performance but the suggestion of this author is to replicate this study again with a larger sample size to test for a significant effect. It still seems clear to researchers like Cadotte, that the coaching role an instructor takes in a simulator exercise is of fundamental importance to the student's success (1995).

In addition, it is very important that even more research be performed that analyzes simulators in applied environments and particularly the differences between skilled (or super-users) and novices utilizing this type of methodology. The impact of experience using similar types of games/tools appeared (at least in this study) to affect the performance of the students more than any other factor.

One additional area that should be explored by future studies is whether students exposed to a simulation and coaching assignment would enjoy the assignment more than a traditional assignment because it is more germane to the expected educational outcomes the student wants (e.g., be able to apply new skills, etc.). Muir (1996), in a study of experiential teaching of business communication skills, stated that the "traditional approach to teaching business communication often presents a simplistic process model that fails to address the political and power relationships that exist in the workplace". In a related study, when students were asked if they were more satisfied with an experiential or project-based class, a couple of studies (Vequist, 2003 & Romney and Cherrington, 1993) found that students did have favorable opinions of these types of experiences. Therefore, similar feedback is expected from the students that would be surveyed regarding their satisfaction with a business simulator assignment.

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