14. The use of simulations in entrepreneurship education: opportunities, challenges and outcomes

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INTRODUCTION

How do we develop entrepreneurial knowledge, skills, and competence?

Certainly, the traditional methods of lectures and textbooks are important in laying down the foundation of entrepreneurship theory and practice. But, to achieve higher levels of critical thinking, it is necessary to ponder, test, reflect and adjust one's knowledge. To achieve skills, we need to practice our trade. And, to achieve competence, we need lots of knowledge and skills.

But, we do not need to do it alone. An entrepreneurial training coach can channel our energies, thought processes, practice routines, and feedback mechanisms to advance the level and the speed with which we attain competence.

We would like to share a process that we have developed at the University of Tennessee to advance the knowledge, skills, and competence of our students. It is based upon an entrepreneurial simulation that has been greatly enhanced with a series of value-added activities and assessments. We will start by reviewing the literature on the value of simulation-based training. Next, we will describe the theory of experiential learning and how it helps to explain the learning process that underlies the use of business simulations. Then, we will introduce the simulation that is used as our learning platform. Our attention will then shift to describing the entire pedagogy with all of its enhancements, including our findings regarding the development of critical thinking skills and adaptive learning. We will conclude the chapter with a discussion of how the pedagogy contributes to entrepreneurial learning. Throughout the chapter, we will discuss the knowledge and skills that we find lacking in our students, which challenge us as educators.

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RESEARCH ON SIMULATION-BASED LEARNING

Computer-based, business simulations have had a long history in business education. Their efficacy has frequently been noted by educational scholars. For example, Stephen et al. (2002) described the value of business simulations in a capstone, integrative course. Furthermore, Faria (2001), Feinstein and Cannon (2002), Gosen and Washbush (2004), Stephen et al. (2002), and Wolfe (1997) have concluded that business simulations are effective due to the realism and control that they provide. Burns and Gentry (1992) and Brooks et al. (2006) have observed that computer simulations offer students very robust experiential learning opportunities and benefits.

In her review of experiential learning, Myers (2010) found the key benefits to be increased student involvement in the learning process, heightened instructor and student enthusiasm, improved student performance on graded assignments, increased student enjoyment and perceived value of the learning experience, and student confidence and competence (p. 23). It is no surprise then that Mottner (2009) observed that 'Competitive, computerized, marketing simulations have been widely used as a teaching and learning tool – particularly in Marketing Strategy and Management courses – and continue to be a meaningful pedagogical tool' (p.1).

WHY ARE SIMULATIONS SUCH POWERFUL LEARNING TOOLS?

The prior research supports the efficacy of business simulations as learning tools. But, why are they believed to work so well? To answer this question, we turn to constructivism and the theory of experiential learning.

Springer and Borthick (2004) observed that business simulations create opportunities for students to work on higher-order thinking skills required for success in business. The critical thinking skills that are developed include 'the ability to solve problems that cannot be described with a high degree of completeness, cannot be resolved with a high degree of certainty, or elicit disagreements from experts about the best solution'. Rather than inheriting a teacher's words, they posit that simulations require learners to construct their own understanding, raise questions, generate and explore their own models and build representations that organize their experiences. In short, learners construct their own knowledge rather than just receive it, an approach to learning known as *constructivism*.

Experiential Learning Theory builds upon the constructionism viewpoint and offers further insight into why simulations are powerful learning

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environments. According to Kolb and Kolb (2005, p. 194), the theory of experiential learning is built on the following six propositions.

1. Learning is best conceived as a process, not in terms of outcomes. The primary focus should be on engaging students in a process that includes feedback on the effectiveness of their learning efforts.
2. All learning is re-learning. Learning is best facilitated by a process that draws out the students' beliefs and ideas about a topic so that they can be examined, tested, and integrated into new, more refined ideas.
3. Learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world. In the process of learning, one is called upon to move back and forth between opposing modes of reflection/action and feeling/thinking.
4. Learning is a holistic process of adaptation to the world. Not just the result of cognition, learning involves the integrated functioning of the total person – thinking, feeling, perceiving, and behaving.
5. Learning results from synergetic transactions between the person and the environment. Learning occurs through the equilibration of the dialectic processes of assimilating new experiences into existing concepts and accommodating existing concepts to new experience.
6. Learning is the process of creating knowledge. Social knowledge is created and recreated in the personal knowledge of the learner. This is in contrast to the 'transmission' model on which much current educational practice is based, where preexisting fixed ideas are transmitted to the learner.

In summary, experiential learning is a process of constructing knowledge that involves a creative tension among the four learning modes of reflection/action and thinking/feeling. This process is portrayed as an idealized learning cycle or spiral where the learner 'touches all the bases' in a recursive process that is responsive to the learning situation and what is being learned. Immediate or concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn. These implications can be actively tested and serve as guides in creating new experiences.

Let us translate the theory of experiential learning into the situational learning of a business simulation. Specifically, a simulation allows students to test their current knowledge in a life-like setting by studying the available information, drawing inferences about the options and potential outcomes, and making decisions based upon this evaluation in the hope that they will play out in certain ways with customers, competition,

MORRIS 9781783471447 (M3509) (G).indd 282 29/07/2014 14:28

employees, operations, investors, and other simulated or real players in the exercise. The students can then compare their predictions with subsequent results and reflect on the meaning of these outcomes. Which expectations (hypotheses) were supported and which were not and why? These reflections often cause students to reconstruct their knowledge, knowledge that can be acted upon (tested) and refined in subsequent decision rounds.

The experience is both cognitive and emotional. The cognitive part comes in the knowledge-based decision-making. The emotional part draws from the confirmation or disconfirmation of one's knowledge and expectations (elation or frustration). It can also come from one's relative success in outsmarting the other participants (competitive energies). And, there is frequently a strong emotional attachment or bonding with the other members of the team that heightens the emotions associated with successes or setbacks. Emotional bonding can also serve as a motivator and drive the students to 'pull their weight' and 'not let the team down'.

Like Springer and Borthick (2004), we also see a change in the role of the teacher, from that of a presenter to that of a coach. 'In the constructionists' approach, the teacher's role is to pose problems in realistic meaningful contexts, model behaviors that facilitate learning such as collaboration and reflection, and insure that learners attend to inconsistencies and errors arising in their mental representations'.

In the following sections, we will describe a pedagogy developed at the University of Tennessee that encompasses the constructivism approach to learning as well as the tenets of the Theory of Experiential Learning. It is built upon the new venture scenario built into the Marketplace Live® simulations offered by Innovative Learning Solutions, Inc. The pedagogy includes several value-added exercises and assessments, all of which are designed to advance the entrepreneurial knowledge, experiences, and skills of all business students. We will also present data that shows the progression of their critical thinking skills and ability to successfully adapt to the uncertain, ill-defined, and dynamic world of the entrepreneur. We will conclude the chapter with a discussion of value of simulations to train entrepreneurs and the challenges that remain.

AN ENTREPRENEURIAL SIMULATION

The course that is our focus is required of all business majors and is offered in the junior year. It is a three-hour, semester-long course intended to integrate and reinforce the content of the functional courses in the core curriculum and provide our students with a comprehensive entrepreneurial experience.

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The course revolves around a simulation entitled *Strategic Corporate Management* (SCM). SCM is an entrepreneurial, large-scale, competitive, full-enterprise simulation. It is integrative in that students struggle with business fundamentals and the interplay between marketing, sales channels, human resources, operations, finance, and accounting. It is both tactical and strategic in that there are many low level tactical decisions that must be managed according to a higher-level strategy. It requires a team of students who specialize in functional roles and need to work together and coordinate their decisions over an extended period of time in order to achieve the team's strategic goals.

It is entrepreneurial in that the simulation employs a new venture situation where students build a business from the ground up. Throughout its two years of operations (eight decision rounds or business quarters), the business evolves and becomes more complex as new decisions need to be made. At the same time, there is a great deal of repetitive work in the ongoing operations, reinforcing previously introduced procedures, reports, and tools of management.

Every business quarter, students must analyze an evolving situation, plan a strategy to improve it, and then work through many tactical decisions as they attempt to execute that strategy. They face great uncertainty from the market, employees, investors, their own decisions and competitors that are trying to outsmart them. Incrementally, they learn to skillfully adjust their strategy and tactics as they discover the nature of their real-life decisions, including the available options, linkages to other functions, conflicts, tradeoffs and potential outcomes.

The students compete in teams of five students in universes (games) composed of four teams. Approximately 700 undergraduate students annually participate in the experience. Another 250 graduate students have a similar experience at the end of their MBA program.

Timeline of Simulation Activities

To help the reader envision the totality of the learning experience, we have created a timeline depicting the typical progression through a simulation experience. As shown in Figure 14.1, there are four phases to the simulation.

The Startup Phase is composed of the first four quarters of play, during which students learn the business. In Quarter 1, students select their executive team through a sports-like draft, organize themselves and their functional roles, and decide upon the culture they would like to inculcate and how they want to make decisions. They also name the company and contract for a survey of potential customers.

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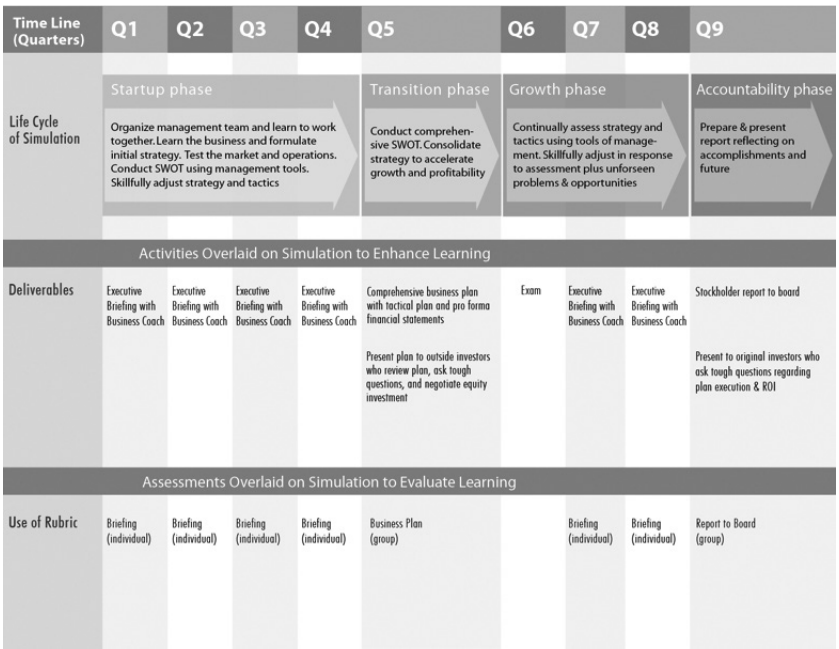

Figure 14.1 Timeline of simulation activities

In Quarter 2, they conduct a market opportunity analysis with the market research they have collected, establish an initial business strategy and begin to set up their business designing brands, opening of sales outlets and locating and constructing a factory. In Quarter 3, they go to test market, making a host of business decisions related to prices, ad copy, media, sales force staffing, compensation and the web. They also get the factory up and running and must forecast demand, schedule production, manage cash and prepare pro forma financial statements.

In Quarter 4, the executive team starts by conducting a strategic analysis. It can purchase reports on customer satisfaction with brands, ads, prices, and reliability plus learn about the tactics and performance of competitors. There are also a series of internal reports dealing with the profitability of their brands, channels, and markets plus reports on factory operations, employee productivity, and finances. All of this information is designed to help teams to discover what worked and did not work and how their knowledge and assumptions need to be adjusted. They then refine their strategy, adjust tactics, prepare pro forma projections and go back to the market to discover if their knowledge has improved. In most

MORRIS 9781783471447 (M3509) (G).indd 285 29/07/2014 14:28

cases, the teams will experience significant improvements, although the rate of change will vary by team.

Typically, the students' performance and understanding of their business improves during Quarter 4. This sets the stage for the Transition Phase of the business, which takes place during Quarter 5. We pause from the normal cycle of one decision round per week and give the students an additional week to reflect on their experience, review their new options, and refine their strategy going forward.

Within the game scenario, the executive team invests the seed capital to set up and run the business for the first year. During Quarter 5, they receive an infusion of venture capital and, for the first time, are able to borrow from a bank. With the new money, they can significantly ramp up their plans for the future by investing in R&D to improve brand designs and customer value, more sales outlets for greater distribution, more factory capacity to handle the projected larger demand, more quality control and lean manufacturing to improve factory operations, and better compensation for their employees. With the tactical planning and pro forma financial statements within the software, they can develop a comprehensive strategy to carry them through the end of the exercise. Thus, Quarter 5 is a period of significant transition from a fledging new venture to a high growth, fully functioning enterprise.

The third phase, Growth, is played out over Quarters 6, 7 and 8. During this time, the teams deploy the tactics that were scheduled under their refined and expanded strategy. They will also need to modify their plans in response to unfolding market and competitive conditions.

The sixth quarter is a deceptively quiet time for the teams. When the teams compare the results for Quarter 5 to 4, they do not see many changes in competitor tactics. Most of the radical changes will have occurred in Quarter 4 as a result of the difficulties that came out of Quarter 3. From the outside, the competition will look like they are staying the course. However, there are a lot of surprises brewing on the inside.

In Quarter 6, all of the competitors will be introducing new brands with new features, new sales outlets, and more factory capacity, quality and efficiency. These activities are private and cannot be seen by competitors. Even though an executive team knows other firms will be making changes in their tactical decisions, the team has no idea how extensive and aggressive competitors will be. Thus, when the team receives the reports on the results of Quarter 6, they are often surprised by the individual and collective decisions of their competitors.

In addition to competitor-induced surprises, each firm might also have misjudged how its customers, employees, factory, lenders, and competitors would respond to their own decisions. Demand, revenue and profits

MORRIS 9781783471447 (M3509) (G).indd 286 29/07/2014 14:28

might be better or worse than expected, all having a ripple effect on the new quarter's decisions. As a result, the executives will be quickly tasked with figuring out why things did or did not play out as expected.

As the teams respond to the news from Quarter 6, they will need to make changes in their plans for Quarter 7. In general, the teams will tend to stick with the overall strategy that they decided earlier, but make lots of adjustments to their tactical plans.

Quarter 8 will be very much like Quarter 7. Not everything will go as planned in Quarter 7 and the team will need to respond in Quarter 8 to the new conditions that emerged from 7.

Quarter 9 is the Accounting Phase of the simulation. There are no decisions to make. Rather, the executive teams are tasked to reflect on the effectiveness of their strategy and tactics during the second year in business, their plans for the third year, and the lessons they have learned from their new venture.

As can be seen, the cycle of learning is evidenced throughout the simulation experience. The students act upon the knowledge that they have. Their decisions and the knowledge that inspired them are tested in the market. Some things are confirmed but many things need to be pondered and reconciled with what the student currently 'knows'. This reflection results in the reconstruction of the student's knowledge that then shapes the next round of action and testing.

AN ENRICHED LEARNING ENVIRONMENT

As highlighted above, the business simulation provides an environment within which many entrepreneurial experiences can naturally occur. Over time, we have discovered that the simulation can provide a platform upon which additional entrepreneurial learning activities and assessments can be overlaid. We will now describe the enriched simulation experience that is employed at all academic levels at Tennessee. See Figure 14.1 to view the complete pedagogy.

To the core simulation, we have added executive briefings, a formal business plan, a venture capital fair, and a stockholder report. We also changed the role of the instructor to being that of a Business Coach. The Coach's primary objective is now to develop the knowledge, skills and competence of each student and team through constant challenge, frequent feedback, and focused guidance. These activities and the role change created opportunities to capture assessment information. Therefore, rubrics were developed for student evaluation and feedback.

MORRIS 9781783471447 (M3509) (G).indd 287 29/07/2014 14:28

Executive Briefings

Near the end of each business quarter, each executive team conducts an executive briefing (EB) with a Business Coach. See the first row of the value-added activities in Figure 14.1. Ostensibly, the Coach acts as the chairperson of the board and plays the role of devil's advocate. During these briefings, the teams review their (1) performance during the prior quarter, (2) SWOT analysis, (3) changes in strategy for the current and future quarters, (4) new or revised tactical decisions, and (5) pro forma financial projections for the current quarter, as well as the justification for everything.

The EBs allow the Coach to monitor the work and thought processes of each person and team in the exercise. They also provide opportunities for the instructor to coach students in a meaningful context at a time when students are receptive to this coaching. As such, these briefings provide substantial opportunity for student/faculty interaction as desired by many schools and accrediting bodies. The EBs last approximately 25 minutes.

The Business Coach's role during these meetings is to challenge the students' thinking and analysis by looking for inconsistencies and holes in logic, incompatibilities across functions, and various other problems and/or opportunities that the students might have overlooked. The Coach is instructed never to indicate the right decision to make, but to ensure that students have considered the relevant issues, options and tradeoffs related to their strategic and tactical decisions. If students do not understand a certain point, the Coach can give a mini-lecture explaining the relevant issues and options.

Ultimately, the Business Coach helps the fledging entrepreneurs to properly think about their choices, while emphasizing that the choices are still the team's to make and the outcomes are its responsibility. Maintaining a fair playing field is critical to the integrity of the simulation and instructor.

In terms of the real world counterpart, the EBs prepare the students to meet with actual members of a company's board plus critical suppliers, customers, and supporters. In addition to content delivery and discussion, students are trained in professional meeting preparation and management (such as setting agendas, keeping to the schedule, and transitioning speakers).

As might be imagined, the role of the Coach is critical to the entire curriculum. The recruitment and training process is described in Cadotte and MacGuire (2013). Riley et al. (2013) offer further insight into how a Coach can add to the learning process.

MORRIS 9781783471447 (M3509) (G).indd 288 29/07/2014 14:28

Comprehensive Business Plan and Venture Capital Fair

At the midpoint of the exercise, the students participate in a venture capital fair. The teams are asked to prepare a Business Plan and present it to a group of independent judges who serve as venture capitalists. See Period 5 in Figure 14.1. The judges are drawn from the business community and Ph.D. programs and have expertise in many different fields of business.

For this comprehensive and complex assignment, the students must develop a formal strategy and work through the tactical details and cash flow requirements to execute it, including all the linkages among the functions. Following the presentation, the team must defend the plan in response to a variety of far-ranging questions from the judges.

The business plan itself is a power point presentation along with a detailed tactical plan and pro forma financial statements for the next four decision periods. The students have 25 minutes to present their plan, answer questions and convince the investors that they are worthy of a full investment. After listening to all of the business plans and reflecting on their merit, the investors decide how much to invest and the share of the company they want in return for that investment. In the graduate version of the class, the investors have follow up meetings with select teams in order to discuss the plan in more detail and negotiate an investment. In both cases, a team may receive less money and/or give up more equity then planned, thus there is a fair amount of risk for the team.

The business plan preparation is very important to the development of the students' ability to think broadly and deeply about their business. They have to understand how all of the functional parts of the business work together across multiple planning periods. They need the vision of what they want to accomplish and then they have to work the details to make it happen.

The actual planning process is cyclical. Students have to set realistic goals, work the tactical details to achieve the goals, check the financial projections to make sure they have the money to do what they would like to do, and then revise everything when they discover that the plan is not internally consistent, realistic, and/or attractive to outside investors. To do this, they need to also consider a variety of 'what if' scenarios and the contingency plans that follow from them.

The presentation and defense of the business plan are also important in developing a critical entrepreneurial skill– asking for money. Although this scenario uses venture capitalists and a venture capital fair, the fundamental challenges are how to ask for money, justify its use with a credible plan and believable results, and be able to convince critical investors that

MORRIS 9781783471447 (M3509) (G).indd 289 29/07/2014 14:28

you have the team that can do these things plus deal with surprises that will be thrown at you.

Stockholder Report

At the end of the exercise, there is a final accounting of the team's performance. The outside evaluators are invited back in their new role as the Board of Directors. Importantly, teams must look the people from whom they took money in the eye and provide an accounting of their actions and performance since the plan was initially presented.

Specifically, the teams are asked to: (1) compare the actions taken against the plan; (2) discuss any departures from the plan and their justification; (3) review significant events that affected the company and market; and (4) explain why they did or did not achieve their goals. The report concludes with a focus on reflective learning. The students are asked how they benefited from the entrepreneurial experience and what lessons can be taken into the business world.

In terms of accountability, the outside evaluators are eager to discover their return on investment and why the plan went well or badly. They often ask questions about performance, strategy, tactics, competition, and the business logic behind all of these issues. The Stockholder Report and the first Stockholders' Meeting have obvious parallels in the entrepreneur's world. That is, entrepreneurs need to account for the resources they have been given and the promises they have made. It is often uncomfortable to report performance outcomes that fall short of promises, but this kind of candid reporting is hopefully very constructive to both the individuals and business involved.

ASSESSMENTS OF LEARNING

Normally, assessments are included in a course to insure that the requirements and learning objectives have been met. To this end, they are useful in marking or assigning grades. They can also help students understand their strengths and shortcomings and how to improve. And, they can help program administrators evaluate how well the learning outcomes of a curriculum have been achieved. Toward these ends, a number of course-embedded assessments were developed. They can be found in the bottom part of the timeline within Figure 14.1.

At the individual level, we created a rubric to assess the critical thinking observed during the executive briefings. At the team level, we created (1) a rubric to evaluate the Business Plan, (2) a rubric to evaluate the

MORRIS 9781783471447 (M3509) (G).indd 290 29/07/2014 14:28

Stockholders' Report, and (3) a balanced scorecard to evaluate a team's overall simulation performance. We will discuss the EB rubric and balanced scorecard in some depth and briefly touch upon the rubrics for the Business Plan and Stockholder's Report. We note that the rubrics were developed and refined by the coaching team over a two-year period based upon their efficacy in guiding and evaluating students, and are available from the author.

Executive Briefing Rubric

The rubric for the executive briefing focuses on the student's ability to thoughtfully present his/her tactical decisions based on a concise analysis of relevant market, operational, and/or financial data as well as a consideration of how these decisions will impact the firm's overall strategy, other functional areas, costs, revenues, and the firm's future capabilities. We also determine if the student can think on his/her feet and respond to questions and challenges in a thoughtful, confident manner.

The rubric itself is presented in Table 14.1. Note that the rubric parses out performance along the dimensions of Depth of Understanding, Breadth of Understanding, and Management by the Numbers. As shown, students are evaluated on a four-point score from weak to very effective. As can be argued, there is a correspondence between the four rubric ratings and the degree to which a student has progressed up Bloom's revised hierarchy of learning (Cadotte and MacGuire 2013).

The students are given the rubric in advance and provided guidance by the Coach in terms of the requirements to achieve a level 3 or a level 4 evaluation. By providing the rubric ahead of time, students can use critical thinking skills to evaluate their own deficiencies going into and out of each briefing (Athanassiou et al. 2003). Pintrich (2002) found that students learn best when they are able to use meta-cognitive processes to determine what they do not know in relation to a given task, which is consistent with the Theory of Experiential Learning.

Figure 14.2 contains a summary of the average student score over the course of five EBs. Only five EBs were evaluated. The first one was treated as a trial briefing and not graded, one was omitted while the students worked on their business plan and one was replaced by a comprehensive objective assessment on the exercise. A total of 697 undergraduate students were evaluated with this rubric during the spring and fall semesters of 2013.

As can be seen from the chart, students had a good understanding at the outset of their functional area of responsibility (as measured by depth of understanding). The justification for their decisions was largely in business

MORRIS 9781783471447 (M3509) (G).indd 291 29/07/2014 14:28

MORRIS 9781783471447 (M3509) (G).indd 292

Table 14.1 Executive briefing rubric

	1 WEAK	2 NEEDS TO IMPROVE	3 EFFECTIVE	4 VERY EFFECTIVE/ STRONG	SCORE
Depth of Understanding	Student simply listed the decisions in his/her area of responsibility with no business logic or rationale.	Student was comfortable with reviewing several of the actions taken in his/her area of expertise but the business logic was only partially developed and/or sometimes weak or unclear. When prompted for further explanation, the student needed to consult other members of the team for help.	Student was well versed within his/her area of responsibility. Student was successful in developing the business logic using readily available data. However, he/she did not investigate different options/scenarios, drill down into root causes of performance outcomes, or go beyond the obvious analysis of the available information.	Student clearly mastered his/her area of responsibility by demonstrating reasoned judgment, analytical skills, and forward planning. Student came to thoughtful conclusions derived from an extensive evaluation of different options/scenarios within his/her function. He/she creatively analyzed available information, drilled down into root causes, and worked through the potential outcomes of various tactical options/ modifications.	
Breadth of Understanding	Student did not make any reference to other areas of the business or	Student mentioned other functions in his/her discussion but there was no or little evidence that he/she understood the	Student demonstrated a good understanding of how his/her decisions tied into the overall strategy of the firm and how the decisions affected	Student had a broad understanding of the whole firm, showing good insight into the management of each function. Decisions were presented in light of	

29/07/2014 14:28

MORRIS 9781783471447 (M3509) (G).indd 293

	the firm's strategy. When prompted for this knowledge, the student was unable to answer.	concept of functional integration. There was no evidence that the decision-making process was derived from the firm's overall strategy. Student did not demonstrate his/her ability to predict future outcomes based on lessons learned and corrective actions.	Student demonstrated a good understanding of how his/her decisions tied into the overall strategy of the firm and how the decisions affected and were affected by the other functional areas. However, there was no multifunctional forethought and contingency planning.	the overall strategy and how the decisions impacted and were impacted by other functional decisions. Serious consideration was given to multifunctional outcomes and contingency options under different scenarios [forethought]. Student was able to think on his/her feet and respond to wide-ranging questions and challenges in a thoughtful, confident manner.
Management by the Numbers fusing the tools of management)	No data was presented to support the student's analysis, plans, and investment decisions, etc.	Student mostly used general statements to make his/her case. Limited use of data to support the student's arguments or there were errors in the data presented. More or better quantitative information was needed.	Ample use of the available quantitative data to support the analysis, plans, investment decisions, financial request, etc. A deeper analysis using more advanced tools of management such as QFD, statistical analysis, marginal analysis, profit analysis, valuation analysis, etc. was not apparent. Student hesitated to use data during Q&A	Student effortlessly incorporated hard data when making a point or supporting a position. It was clear that the student evaluated the firm's options by extracting appropriate data and analyzing it using advanced tools of management. Student was able to interpret the data and make recommendations. Tactical and strategic changes clearly stemmed from the student's ability to analyze and/or interpret data.

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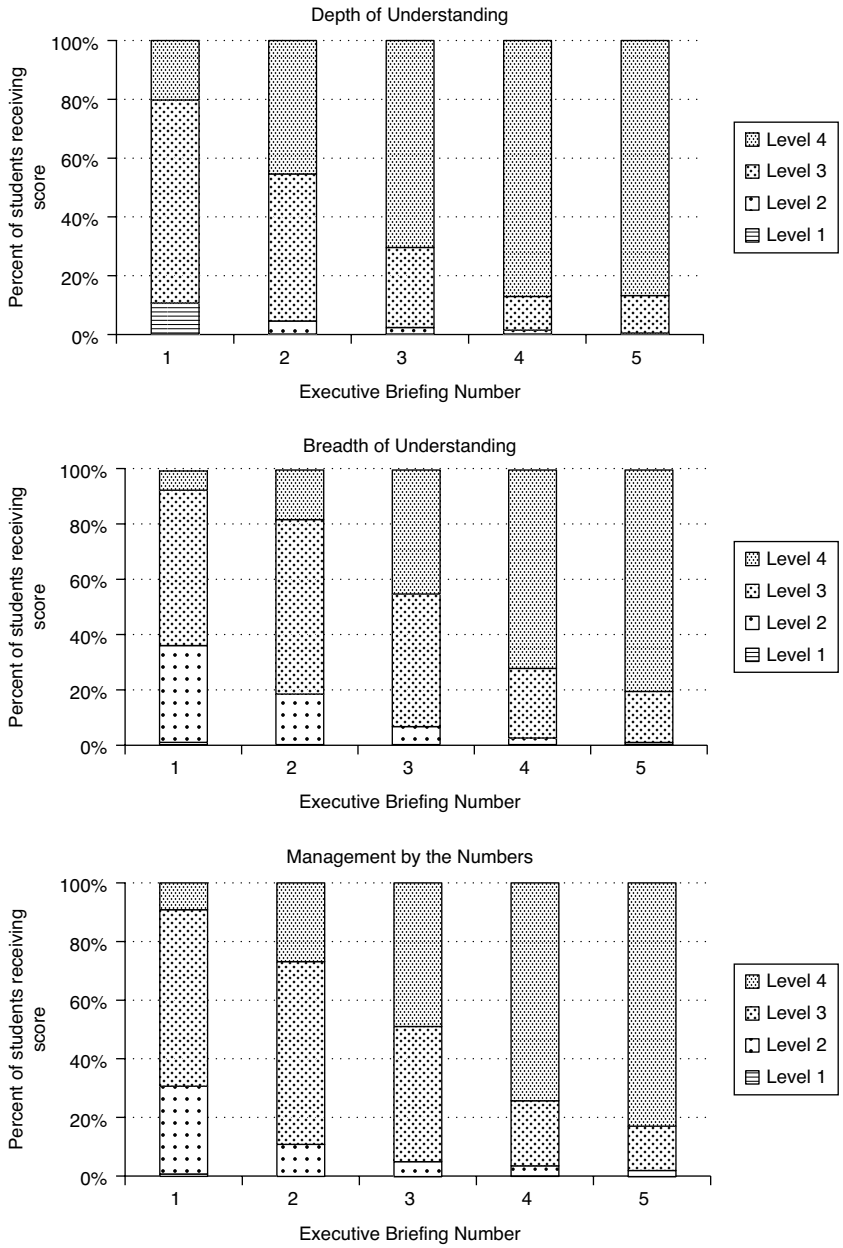

Figure 14.2 Executive briefing rubric scores for students (Spring 2013 and Fall 2013)

terms with fundamental analytics to back them up. There were deficiencies early on in cross-functional knowledge and management by the numbers. What is noteworthy overall is that the average ratings grew steadily until the vast majority of students achieved the highest rating by the end of the exercise.

Business Plan Rubric

The business plan rubric contains thirteen dimensions that focus on the quality of the business plan and its presentation to potential investors, including Executive Summary, Assessment of Current Situation (looking forward), Strength of Strategy, Assessment of Risk, Assessment of Return, Management by the Numbers (using the tools of management), Assimilation and Integration, Business Acumen, Team Strength, Organization, Format of Presentation Materials, Professional Delivery, and Mechanics.

To help prepare students for this event, they are given lectures on content, analysis, and delivery. They are also given the rubric in advance so that they fully understand what is required of them. Finally, they submit a draft of their tactical plan, pro forma statements and business plan presentation to the Coach for feedback prior to the actual presentation. Our goal is to help the students in making their pitch for investment capital since none of them have done this before.

Each outside judge/investor at Tennessee completes the rubric evaluation. These scores are shared in an anonymous fashion with the students for feedback and the Coach seriously considers them in the final grade. However, only the Coach's scoring is used in grading.

Although there is not space to present the rubric scores, we can report that students do well in the areas of assessment of the current situation, assimilation and integration, team strength, organization, and format of presentation materials. However, the investors do not give many high marks for their assessments of risk and return and report some weakness in strength of strategy and management by the numbers. These finding indicate how difficult it is to prepare a cogent plan that is comprehensive, internally consistent, believable, and financially attractive.

Report to Board Rubric

The rubric for the final report also contained thirteen dimensions, ten of which were in common with the business plan (Executive Summary, Assessment of Current Situation, Management by the Numbers, Assimilation and Integration, Business Acumen, Team Strength,

MORRIS 9781783471447 (M3509) (G).indd 295 29/07/2014 14:28

Organization, Format of Presentation Materials, Professional Delivery, and Mechanics) and three that were unique to the purpose of the report (Assessment of Strategy and Execution, Investments in the Future, and Lessons Learned).

On two of the new metrics, assessment of strategy and lessons learned, the students did well. They were not judged as well on their investments to prepare the firm for the future. In metrics common to the Business Plan and Report to the Board, the teams improved in all areas. Similar to the executive briefings, the students appeared to exhibit a deeper understanding of the management of their new venture by the end of the exercise. This is not to say that all were successful in the management of the firms but that, for the most part, they understood the process and what they had done right and wrong and needed to do to improve their performance.

Performance Scorecard

For some time, businesses have been using a critical tool to help measure performance across a myriad of dimensions and functions. This tool, commonly known as a balanced scorecard (BSC) (Kaplan and Norton 1992), allows managers to take a more holistic view of the business (Atwater et al. 2008; Dilla and Steinbart 2005), as opposed to optimizing certain areas to the detriment of others. The objective criteria specific to the *Marketplace Live* simulation include measures of financial performance, market performance, marketing effectiveness, investments in the future, asset management, manufacturing productivity, creation of wealth, human resource management, and financial risk. Success in each area requires a solid understanding of how functional decisions affect performance in both related and indirectly related areas. Therefore, the scores provide a good indication of how well the students manage each functional area and the new venture as a whole.

The BSC is calculated at the end of each decision period based on the period's results. Each team receives both an overall performance score and detailed scores on individual performance criteria at the start of a new quarter. They also receive comparative numbers for the competition to facilitate benchmarking. Delving into the underlying calculations for each metric is required in order to discover the root causes of any deficiencies.

The BSC provides an important feedback loop for the students. Using objective data, they can monitor their performance, delve into the causes of shortfalls and successes, and adjust strategy and tactics accordingly for all aspects of the firm. If they do not understand how to make certain business decisions or how the decision options affect their performance or the

MORRIS 9781783471447 (M3509) (G).indd 296 29/07/2014 14:28

other team members' ability to make good decisions, they can seek information sources such as teammates, the Coach, help files, and textbooks to fill in the gaps. Through self-monitoring, most students learn to skillfully adjust their knowledge and decision-making over time to improve performance. The Coach can also use the performance scorecard for troubleshooting and additional guidance.

We can track student performance in managing their new venture over time. Figure 14.3 contains the distribution of BSC scores for 145 teams over periods 3 through 8. We can see that almost all teams start at zero in the first quarter of business. From quarter to quarter, we see more and more firms lift off of the floor and achieve positive results. We also see the magnitude of their improvements accelerating. Because the BSC is often the topic of conversation during EBs, we know that students are continually trying to understand what causes the numbers to be what they are and how to make decisions that will improve them. As such, we see students engaged in adaptive learning, supporting the feedback loop underlying the theory of experiential learning.

On the other hand, we find substantial variance in how the teams perform. It is worrisome that almost 20 percent of our teams do not meet our minimum standard of achieving a score of 5.0 on the cumulative balanced scorecard, and many others are not far above it.

We have tried to ascertain why these teams did not perform well. At the core, they are not able to profitably run an entrepreneurial business over the course of the exercise. This deficiency is, in turn, driven by an inability to (1) satisfy customer needs, (2) develop widespread distribution, (3) drive production costs down via economies of scale, lean operations, and quality, (4) manage financial resources, and ultimately, (5) execute a successful business strategy.

If there is one underlying weakness, it is that these teams do not fully understand cause and effect in the operation of a new venture. They cannot readily see how individual tactical decisions impact many other operational aspects of the business. They also have difficulty drilling down into the root causes of their problems and understanding how to adjust specific tactics to improve performance. Even though the rubric scores suggest they understand how to manage by the numbers, they find it challenging. It is not unlike a difficult dance routine or football play. Understanding how it is to be done is not sufficient; you must be able to actually do it, and that takes practice. We can say that even decent teams have difficulty in this area.

These findings present a fundamental challenge to Tennessee, and probably many schools. Our students need more training in the dynamic management of business strategies. Specifically, they need to be more adept

MORRIS 9781783471447 (M3509) (G).indd 297 29/07/2014 14:28

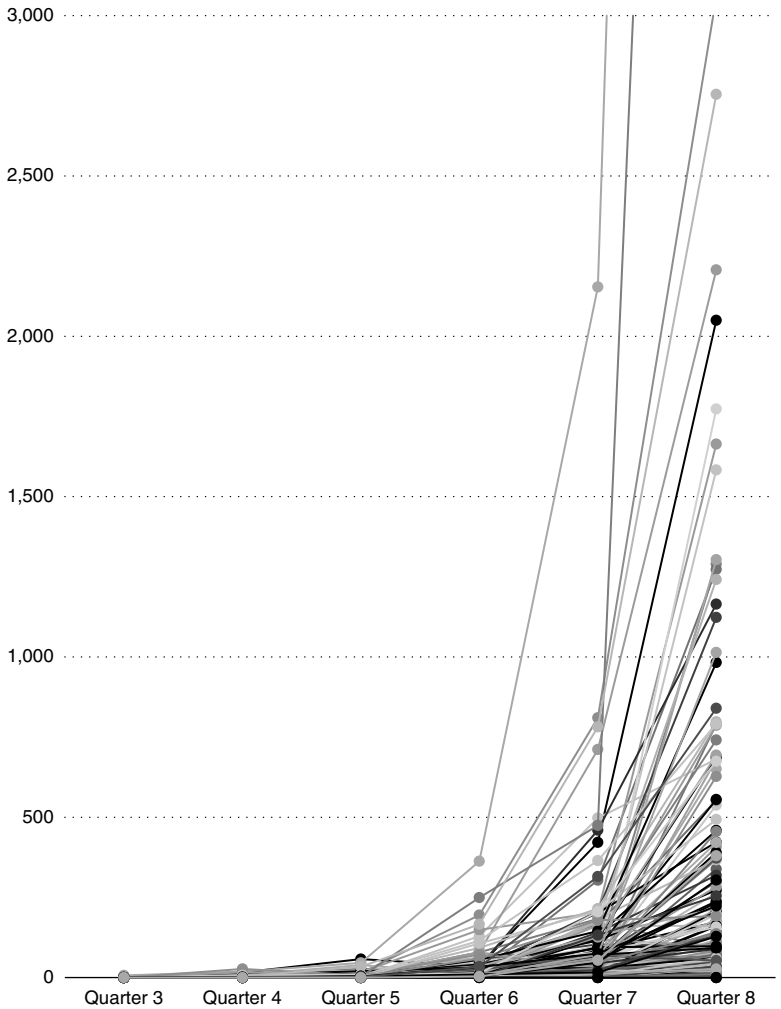

Figure 14.3 Trend lines of balanced scorecard scores from quarter 3 to quarter 8 145 teams, Spring and Fall 2013

at (1) using evidence to make decisions, (2) maximizing the use of scarce resources, and (3) thinking through decisions, all skills important to being an entrepreneur. While these skills are being developed within the simulation exercise described here, further training via real-world projects and additional simulations is needed. These need to be augmented by rubrics, performance scorecards, and above all, coaching.

MORRIS 9781783471447 (M3509) (G).indd 298 29/07/2014 14:28

PRACTICE IN BEING AN ENTREPRENEUR

Our experience with an entrepreneurial simulation has proven very helpful in imparting an integrated perspective of business and giving our students experience in starting up and running a new venture. Our students have had to:

- pull together a group of people into an effective management team – people who have limited business skills and very little familiarity with each other;
- run a business without any prior experience in doing so;
- deal with many, unstructured, ill-defined issues that keep cropping up as the business evolves in both expected and unexpected ways;
- manage scarce resources across too many business priorities that deserve, even require, the support of the executive team;
- live, even thrive, with the unexpected, uncertain, and unpredictable;
- develop a comprehensive, integrated, self-sustaining business plan that can provide a roadmap for the future and entice potential investors to fund the growing business;
- present and defend oneself and plan to unfamiliar, critical professionals who have far-ranging priorities and expertise in order to obtain funding for a business;
- be challenged every step of the way by a Business Coach who is trying to find fault with one's knowledge, analysis, assumptions, logic, and projections;
- be judged not by promises but by results.

WHAT DRIVES THE LEARNING PROCESS?

The data suggests that students steadily improved in their critical thinking (Figure 14.2) and adaptive decision-making (Figure 14.3). What caused the apparent progression? We think there are many factors; some relate to the theory of experiential learning while others are unique to the simulation pedagogy.

First, the experiential process of repeated action, reflection, accommodation, and testing is woven into the simulation pedagogy. Over the course of the simulation, students had to repeat many decisions, review much of the same information, and face similar challenges from their Coach. Progressively, they began to find new ways to analyze their situation and discover the root causes for their strengths and weaknesses. This work led to more informed and better judgments. As a result, the students

MORRIS 9781783471447 (M3509) (G).indd 299 29/07/2014 14:28

performed better in the simulation and during their executive briefings. This repetition of difficult and complex decision-making is at the core of the students' development. It has helped our students to refine their knowledge, develop skills that will be useful in business, and hopefully, enhanced their entrepreneurial competence.

Second, there is strong motivation to win. The competitive intensity of a simulation awakens the entrepreneurial spirit of the players. This energy becomes focused on pushing the bar higher than can be reached by the competition. The educational benefit is that students are continually pushed to do better and better by their competitors. If another firm moves up in the rankings, the team has to figure out why and create an action plan to nullify the advantage, or, better yet, create its own advantage. Although the motivation is competition-based, students delve into the business data and try to understand the firm's decisions and how they individually and collectively impact performance. As a result, the students are able to apply better and better reasoning to their business decisions and, concomitantly, their performance improves.

Third, students receive positive feedback for their application, analysis, integration, and creativity. Even if they do not move to the top from one quarter to the next, their performance typically shows improvement (as evidenced in Figure 14.3), which is reinforcing. And, as indicated in Figure 14.2, the evaluations by the Business Coach become more and more favorable as their decision-making reflects higher cognitive processes. Thus, they are encouraged to do better and better. And, it is at this point that the affective aspect of experiential learning kicks in.

Last, the students are continually challenged, encouraged and guided by their Coach to work at the highest level. The Coach sets the bar by specifying the requirements for level 4 in the rubric. The Coach continually stresses this standard. If it is not achieved, the Coach can explain what is missing or needed or provide a brief chalk talk to enlighten the student. These conditions tend to remove the barriers between the student and the Coach, creating a shared space that emphasizes 'care, love, trust and commitment' (Kolb and Kolb, 2005). The process is very formative in developing the desired knowledge and skills. For the student perspective, Cadotte and MacGuire (2013) found that students generally like the coaching process and held a favorable opinion of their Business Coach.

What have we concluded? Through an experiential process of repeated action, reflection, accommodation, and testing, students in an enhanced simulation-based pedagogy have refined their knowledge, developed skills that will be useful in business, and hopefully, enhanced their entrepreneurial competence. Most have come to realize that much of what they

MORRIS 9781783471447 (M3509) (G).indd 300 29/07/2014 14:28

have been taught has relevance in effectively running a new venture. Their small and large successes have often led to a realization that they have what it takes to be an effective businessperson. To this point, Cadotte and MacGuire (2013) observed a significant positive change in the students' confidence over the course of the exercise. But, not all feel ready to be entrepreneurs.

This learning program is targeted at all business students and has proven effective. It can also be shortened and given more focus for added value for entrepreneurship students. Finally, the lessons of experiential learning noted here are probably generalizable to courses that employ a series of cases, extended projects, entrepreneurial consulting, and new business startups.

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