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Business Simulation to Stage Critical Thinking in Introductory Accounting: Rationale, Design, and Implementation

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ABSTRACT: This article explains the rationale for, the design of, and the implementation of business simulation episodes for eliciting a developmental shift from *knowing* to *thinking* in introductory accounting courses. Using business simulations this way responds to a long-standing need for learning experiences that create opportunities for students to work on developing the higher-order thinking skills required for success in business and the accounting profession. The needed capability can be characterized as critical thinking: 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 disagreement from experts about the best solution. This use of business simulation, illustrated with an episode from the Safe Night Out (SNO) simulation, immerses students in the life of an evolving business for which they develop a continuing stream of business advice based on the application of accounting principles. Emphasizing communication skills, alternative viewpoints, and the effect of assumptions on decisions, the simulation episodes demonstrate the usefulness and importance of accounting to business decision makers. The intent of shifting from well-structured end-of-the-chapter problems to more authentic work, like that in business simulations, is to develop higher-order thinking skills while generating interest in the accounting major and increasing the usefulness of accounting in the minds of nonmajors.

Keywords: business simulation; case-based learning; constructivism; critical thinking; financial accounting; in-context learning; managerial accounting; principles of accounting; problem solving; problem-based learning; technology-enabled learning.

INTRODUCTION

Educators, employers, and policy makers have been searching for ways to help their students learn to *think*. The ability to think critically, reason in a variety of ways, and solve ill-structured problems has become essential in a world in which the premium is on one's ability to develop an acceptable solution to the next new problem. Consistent with the goal of improved thinking are the abilities practitioners believe students need to develop to become successful professionals, explained in the AICPA Core Competency Project (AICPA 2002) and the IMA Practice

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Analysis of Management Accounting (IMA 1999). While the plea for increased thinking ability has grown loud in accounting, the instructional resources available to enable it have not been plentiful (Albrecht and Sack 2000), especially at the level of introductory accounting courses.[1] Some exemplary resources have emerged, e.g., the California Car Company serial case featuring a user, decision-making approach (Adams et al. 1999), but more resources are needed to help stage learning experiences to develop higher-order-thinking capabilities in introductory accounting.

The "knowing" of concepts, computations, and definitions has dominated traditional introductory accounting courses (Pincus 1995). The accounting profession, however, has said that this kind of knowing is not enough (Perspectives 1989). If they are to perform at the higher levels of thinking the profession has identified, students need to learn to solve the new, ill-structured problems that will arise in practice. Compared to well-structured problems, ill-structured problems have no "correct" solution because they cannot be described with a high degree of completeness, cannot be resolved with a high degree of certainty, or elicit to disagreement from experts about the best solution (Churchman 1971). Because memorizing solutions to existing problems has proved inadequate as preparation for solving new problems, not just in accounting but also in a variety of disciplines, students need a different kind of learning experience (Peterson and Walberg 1979; Bruer 1993). Specifically, they need opportunities to learn to solve problems by constructing their own representations of the situations and creating their own understandings of what it means to develop and present acceptable solutions. "[W]hen you have invented an idea for yourself, it is much more a part of you than when you memorize a description of it from someone else" (Dykstra 1996, 200).

Constructing one's own understandings rather than inheriting a teacher's words requires learners to raise their own questions, generate and explore their own models, and build representations that organize their experiences (Duffy and Jonassen 1992; Fosnot 1996). In short, learners *construct* their knowledge rather than just receive it, an approach to learning known as *constructivism*. Furthermore, learners assume the role of communicating, justifying, and defending their ideas in a community of learners (Palincsar 1998) analogous to the communities of practice in organizations (Wenger and Snyder 2000). Constructivist theory, evolving over the last half century, had its genesis in cognitive science and psychology (Bruner 1960, 1968; Piaget 1970, 1977; Vygotsky 1978, 1986) and education (Dewey 1933, 1966). In the constructivist approach, the teacher's role is to pose problems in realistic, meaningful contexts, model behaviors that facilitate learning such as collaboration and reflection, and ensure that learners attend to inconsistencies and errors arising in their mental representations (Sharan and Sharan 1992; Bruffee 1999; Evensen and Hmelo 2000). In essence, the teacher becomes a coach rather than a presenter of knowledge.

This article explains how learning experiences in the form of episodes in a business simulation might elicit a developmental shift from *knowing* to *thinking* in introductory accounting courses. Because the ability to think critically is generally thought to develop in late adolescence to adulthood, introductory accounting courses are an ideal stage in the life of accountants and business professionals to begin the process. The simulation, Safe Night Out (SNO), immerses students in the life of an evolving business for which they develop a continuing stream of business advice based on the application of accounting principles. Emphasizing communication skills, alternative viewpoints, and the effect of assumptions on decisions, the simulation episodes demonstrate the usefulness and importance of accounting to business decision makers. The intent of shifting from well-structured end-of-the-chapter problems to more authentic work, like that in the simulation, is to stage the development of higher-order-thinking skills while generating interest in the accounting major and increasing the usefulness of accounting in the minds of nonmajors.

[1] Some resources designed to elicit higher-level thinking by students in upper-level undergraduate courses are Baywatch International (Phillips et al. 2000) and a business activity model (Catanach et al. 2000).

RATIONALE FOR BUSINESS SIMULATION TO DEVELOP CRITICAL THINKING

Although defined in a variety of ways, critical thinking has come to mean forming a conclusion or designing a solution approach through a process of considering the available information, identifying alternatives, and integrating evidence, reason, and values (Kurfiss 1988). "Conclusions are defended as representing the most complete, plausible, or compelling understanding of an issue on the basis of the available evidence" (King and Kitchener 1994, 16). Thinking critically, including sorting out the reasons and linkages behind the facts, allows one to perceive reality as a process that one can influence rather than as an immutable aspect of one's world (Freire 1970). Although students' critical-thinking ability generally increases in college, the effect of the college experience has not been separated from maturation, nor does critical thinking appear to develop more quickly in students completing a course specifically in critical thinking (Pascarella 1999).

Even if the process of developing critical-thinking ability is seemingly opaque, it is possible to characterize stages of thought associated in a relative sense with different levels of critical thinking. For example, in King and Kitchener's (1994) model, which Wolcott and Lynch (1997) applied in an accounting context, the cognitive complexity of critical thinking increases through the seven stages shown in Table 1, each building on the previous stage and laying the foundation for the subsequent stage.

College sophomores have exhibited average reflective judgment scores (corresponding to the numerical stages) of 3.6 (std. dev. = 0.4) (King and Kitchener 1994). Development appears to be gradual, and individuals can operate at more than one stage depending on the situation. For example, students can generally comprehend stage 5 or stage 6 reasoning even if their functional levels are between stages 3 and 5 (Kitchener et al. 1993). The overlapping of stages creates possibilities for instructors to model higher-stage reasoning by targeting educational interventions to the leading edge of development, giving students opportunities to practice operating at higher levels (Kroll 1992b). If college freshmen can respond to learning experiences designed to stimulate questioning and reasoned judgments by thinking at higher levels (Kroll 1992a), it should be possible for sophomores in introductory accounting to be similarly scaffolded. Scaffolding is the practice of providing assistance to students to enable them to perform at higher levels than they could unaided.[2] The intent is to give students opportunities to practice new skills, with the goal of their applying those skills independently in new settings.

Simulations like the one illustrated in this article are designed to give students opportunities to begin practicing the higher-level thinking the profession demands, where the learner identifies problems, finds relevant information, acknowledges the influence of uncertainties on potential solutions, and then communicates findings to target audiences.

DESIGN OF A BUSINESS SIMULATION TO STAGE CRITICAL-THINKING EXPERIENCES: SAFE NIGHT OUT (SNO)

Overview

The Safe Night Out (SNO) simulation takes introductory accounting students on the adventures of Kris and Sandy, sophomores at LeGrande State University, who need accounting information to keep their business dreams alive. The whimsical but realistic episodes show students how accounting skills help answer important business questions, avoid business errors, and inform others about business prospects. The simulation plays off the perennial dream of students to invent a product that

[2] Formally, the developmental range within which a learner can function is known as the learner's zone of proximal development (ZPD), where ZPD is "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky 1978, 86).

TABLE 1
Reflective Judgment Stages

Stage	View of Knowledge	Concept of Justification
Prereflective Thinking: Stages 1, 2, and 3		
1	Knowledge is assumed to exist absolutely and concretely; it is not understood as an abstraction. It can be obtained with certainty by direct observation.	Beliefs need no justification since there is assumed to be an absolute correspondence between what is believed to be true and what is true. Alternate beliefs are not perceived.
2	Knowledge is assumed to be absolutely certain or certain but not immediately available. Knowledge can be obtained directly through the senses (as in direct observation) or via authority figures.	Beliefs are unexamined and unjustified or justified by their correspondence with the beliefs of an authority figure (such as a teacher or parent). Most issues are assumed to have a right answer, so there is little or no conflict in making decisions about disputed issues.
3	Knowledge is assumed to be absolutely certain or temporarily uncertain. In areas of temporary uncertainty, only personal beliefs can be known until absolute knowledge is obtained. In areas of absolute certainty, knowledge is obtained from authorities.	In areas in which certain answers exist, beliefs are justified by reference to authorities' views. In areas in which answers do not exist, beliefs are defended as personal opinion since the link between evidence and beliefs is unclear.
Quasi-Reflective Thinking: Stages 4 and 5		
4	Knowledge is uncertain and knowledge claims are idiosyncratic to the individual since situational variables (such as incorrect reporting of data, data lost over time, or disparities in access to information) dictate that knowing always involves an element of ambiguity.	Beliefs are justified by giving reasons and using evidence, but the arguments and choice of evidence are idiosyncratic (for example, choosing evidence that fits an established belief).
5	Knowledge is contextual and subjective since it is filtered through a person's perceptions and criteria for judgment. Only interpretations of evidence, events, or issues may be known.	Beliefs are justified within a particular context by means of the rules of inquiry for that context and by context-specific interpretations of evidence. Specific beliefs are assumed to be context specific or are balanced against other interpretations, which complicate (and sometimes delay) conclusions.
Reflective Thinking: Stages 6 and 7		
6	Knowledge is constructed into individual conclusions about ill-structured problems on the basis of information from a variety of sources. Interpretations that are based on evaluations of evidence across contexts and on the evaluated opinions of reputable others can be known.	Beliefs are justified by comparing evidence and opinion from different perspectives on an issue or across different contexts and by constructing solutions that are evaluated by criteria such as the weight of the evidence, the utility of the solution, or the pragmatic need for action.
7	Knowledge is the outcome of a process of reasonable inquiry in which solutions to ill-structured problems are constructed. The adequacy of those solutions is evaluated in terms of what is most reasonable or probable according to the current evidence, and it is reevaluated when relevant new evidence, perspectives, or tools of inquiry become available.	Beliefs are justified probabilistically on the basis of a variety of interpretive considerations, such as the weight of the evidence, the explanatory value of the interpretations, the risk of erroneous conclusions, consequences or alternative judgments, and the interrelationships of these factors. Conclusions are defended as representing the most complete, plausible, or compelling understanding of an issue on the basis of the available evidence.

Source: King and Kitchener (1994, 14–16).

takes off in the marketplace. The first episode prompts students to explain what the entrepreneurs *need to know* about accounting to get their business started. The episodes gradually get more involved as the business grows, culminating in a full month of transactions requiring an accrual basis profit calculation for an estimated tax deposit and a cash flow analysis to explain why the checkbook balance is so low. The entrepreneurs reach various decision points and receive various business offers along the journey, all of which require accounting to understand and evaluate. The episodes feature assumptions, explicit and implicit, and unknowns that prompt students to develop critical-thinking skills.

Business Owner as Audience

Students identify with the entrepreneurs because the requirements come from the business rather than the instructor. This shift changes the motivation for developing business and communication skills from "having to write a paper for this class" to "learning to give business advice to business owners." *Student as expert* reflects a shift from instructor-centered learning, where the *instructor knows all*, to a more learner-centered approach in which learners construct the knowledge they need to provide business advice. The requirement to give business advice mirrors the AICPA's CPA Vision Project, which views the CPA as becoming a business advisor rather than only the "bean counter" of yesteryears (AICPA 2000). The simulation was designed to strengthen students' persuasive communication skills.

The simulation offers a new twist to assignments at the introductory level by insisting that the advisor student groups keep track of prior advice and predictions and explain how circumstances or assumptions change over time. This realistic, iterative aspect of businesses, which must update plans and reevaluate operations and opportunities over time, reinforces the idea that the student advisor is accountable to the client rather than to the instructor.

The episodes and related requirements are loosely structured in that the business owners do not provide all the details, such as the interest rate to assume for a contemplated loan. The purpose of this ambiguity is to convey a realistic scenario in which the business owner is not the expert but the audience, the beneficiary of the advice. The student becomes the expert. Having the student begin to understand the business owner as the audience changes the writing assignment from "proving what you know to the instructor" to "guiding the owner to the best course of action." This stance is intrinsically more interesting to students and makes the episodes a more authentic representation of accounting work. This framework also leads more naturally into a setting where instead of right answers, there is good advice and appropriate cautions one can give in the circumstances. It also reinforces that computations must be interpreted and that using information technology tools is an integral aspect of accountants' work (Böer 2000). Further, students come to appreciate that legitimate calculations can be used inappropriately when their interpretation fails to incorporate essential assumptions or other relevant factors.

Scaffold for Staging Higher-Level Thinking

The simulation features an embryonic business to make the context and the business decisions understandable and relevant to college sophomores without business experience. This permits students' engagement with the simulation to begin with developing advice for the entrepreneurs rather than simply becoming familiar with existing business procedures whose rationale has long since been forgotten. As in real settings where business people learn by participating in the business, students learn about the business by living, albeit vicariously, its operations and evolution. Another advantage of this approach is that it prompts students to construct their own mental representations of the business rather than continuing their long-standing behavior of attempting to discern what they think the instructor will ask on exams.

Differentiation of Simulation from Case- and Problem-Based Learning Approaches

Although similar in many respects to case- and problem-based learning approaches, the simulation approach portrayed here differs from both pedagogies in important ways. The archetypical-case-based strategy features using cases after the relevant topics have been covered to help test understanding and promote synthesis of knowledge (Williams 1992). Here, although the course covered topics before students began working on the simulation episodes pertaining to them, the episodes were intended to create a need for students to develop the metacognitive skills required for solving the instant problems as a means of developing capabilities for solving any similar problems in the domain. A second difference between the case and simulation approaches is that cases typically present a large volume of text and schedules, whereas this simulation presents minimal text in order to maximize learner engagement in generating and analyzing alternatives, resolving competing viewpoints, and preparing client advice. A third difference between cases and this simulation is that the simulation maps learner tasks to stages of reflective judgment (King and Kitchener 1994) to make explicit the thinking that each episode is designed to prompt from learners. Across episodes, the tasks are sequenced to enable learners to experience thinking at higher stages to help them develop capabilities for thinking at higher stages without assistance.

While this simulation approach and problem-based learning share the tenets of constructivism, problem-based learning as originally conceived for medical education (Barrows 1985, 1986) drives all learning from the problem. That is, there is no coverage of topics beforehand. The complete focus is on students developing skills in diagnosing patient ills through hypothesis generation and evaluation. Although some problems in the simulation could be thought of as diagnosing a business condition, the simulation requires solving design problems too.

The Safe Night Out Simulation by Episode

Episode 1: Assessing Product Feasibility

The product is an invention of Sandy and Kris—the Safe Night Out (SNO) device, which car owners install to detect the speed and route taken by their cars. They market the product initially to parents with teenage drivers. In episode 1 (Appendix A), Sandy and Kris want to know if the product is feasible, how many units they would have to sell to break even, how long they would have to sell it to pay tuition, and what the monthly profit might be. This assignment requires students to start at the required calculations (often an end in itself in a traditional course) and move to "how could these calculations be wrong or mislead my client?" This movement from knowing the answer to creating an argument based on the computations characterizes all the episodes.

By stage in the Reflective Judgment Model (King and Kitchener 1994), this episode prompts students to:

- Stage 4: Develop reasons for believing that go beyond relying on experts, e.g., recognizing that price or costs are more under Sandy and Kris's control than sales volume;
- Stage 4: Confront the anxiety induced by multiple perspectives on an issue, e.g., the continued appropriateness of the advice if fixed costs are introduced at a later date or sale volume is sensitive to price; and
- Stage 5: Recognize that knowledge is uncertain because of limitations that cannot be overcome, e.g., none of the characters knows the actual sales price, volume, or costs.

Regardless of the inherent ambiguities in the business situation, students must give the owners advice about how to view their business prospects. Students practice basic accounting skills while learning that the skills are only tools to be applied in context giving results to be interpreted. Real accounting contexts involve estimates, opinions, personalities, unknowns, constraints, and mistakes. Real clients might be inexperienced, biased, and resistant to advice.

Students earn half the points for an episode for the advice memo, and half for the spreadsheet calculations and reports supporting the advice. All advice must offer value to the inexperienced owners by not only answering their questions, but also by noting how the answers should be interpreted. In addition to the client memo for each episode, students must create a spreadsheet model with an input sheet, calculation sheets, and report sheets. The client must be able to update the assumptions (on the input sheet) with the calculations updating automatically.

Episode 2: Considering a New Offer

Because of their sales success, Sandy and Kris receive an offer from PepBoys to test market their product. This distribution channel has a different cost structure and working capital requirement compared to those in episode 1, where Kris and Sandy sold on eBay (online auction). Students must evaluate the profitability of the PepBoys' offer, contrasting it to sales on eBay. In addition to deciding if Sandy and Kris should pursue either or both distribution channels, students must determine how much working capital the new offer would require and prepare a letter to their parents convincing them to underwrite the deal.

Mapped to the Reflective Judgment Model (King and Kitchener 1994), these requirements prompt students to:

- Stage 3: Gather evidence to support an argument;
- Stage 5: Recognize alternative points of view and multiple legitimate solutions; and
- Stage 5: Defend a point of view with quantitative, probabilistic, and qualitative reasoning, e.g., two distribution channels would increase product exposure and probably introduce fixed costs.

Episode 3: Evaluating Actual versus Planned Results

After a month of activity on eBay, the owners are eager to see results. Students must discover and analyze why profits fell short of the planned profit level. This episode provides actual transactions rather than summarized information, requiring students to manipulate raw data to find the reasons for the shortfall. After finding offsetting sales price variances and sales volume variances, students make recommendations for helping the business get back to the original planned profit level.

In the Reflective Judgment Model (King and Kitchener 1994), this episode develops thinking by having students:

- Stage 2: Discover that the business has both strengths and weaknesses;
- Stage 3: Evaluate the magnitude of the weaknesses from the direct evidence;
- Stage 3: Realize that past activities provide insight, but not conclusive evidence about future events;
- Stage 4: Consider how to build on the strengths of the business; and
- Stage 5: Decide if the business can overcome the flaws (experts might disagree).

Episode 4: Recovering Market Position after Fixing a Product Defect

After four months of sales on eBay, a defect in the product dries up sales. The owners must incur one-time fixed costs and recurring fixed costs to remedy the defect and reintroduce an improved product. Students search through four months of transactions looking for pricing patterns, market trends, collection issues, and other aspects that the owners might find useful in managing the business. After fixing the defect and remarketing the upgraded product, the client needs new projections and recommendations about how to get back to the original planned level of profits.

The critical-thinking aspects of this episode include learning to:

- Stage 3: Tolerate the anxiety that unknown outcomes introduce, e.g., the uncertainty of disillusioned customers coming back;
- Stage 5: Use reason and evidence to defend a point of view;
- Stage 5: Distinguish relevant from irrelevant evidence (ignoring sunk costs); and
- Stage 5: Reconcile conflicting views, e.g., conflicting views on the appropriate period for amortizing the fixed cost of programming.

Episode 5: Ramping Up Sales

In this episode, PepBoys is ready to stock SNOs regularly. PepBoys requires training materials and packaging representing SNO as a house brand. In addition, Sandy and Kris, weary of the paperwork of selling, want administrative help. Students must wrestle with the issues of volume (managing working capital), the dictates of the retailer (designing packaging and materials), and whether to hire a part-time employee or engage an online bill-processing vendor (similar to a make-versus-buy decision).

This episode prompts students to:

- Stage 5: Consider multiple perspectives and resolve disparate points of view;
- Stage 5: Develop explanations of alternative perspectives on issues; and
- Stage 5: Incorporate qualitative aspects in reasoning, e.g., Sandy and Kris do not like the paperwork associated with selling.

Episode 6: Marketing a Different Product in a Different Market

In this episode, the local court wants to use the product to track parolees with daily uploads of driving patterns to the court's server. The court would lease the product for the duration of the probation term for each parolee. Probation officers would need training. Students must analyze the cash flow and profitability of the deal and advise Sandy and Kris of its desirability.

To complete the episode, students:

- Stage 5: Interpret new evidence in light of previous interpretations, e.g., balancing the long-term relationship between cash flow and profits;
- Stage 5: Develop strategies for evaluating courses of action when the possibilities have deficiencies, e.g., developing product strategies for serving new customers while avoiding alienating existing customers; and
- Stage 5: Resolve multiple competing views, e.g., approaches to amortizing start-up costs.

Episode 7: Making Enough Profit to Pay Tax

Although eBay volume skyrockets, the business has very little cash. Do the owners have to make an estimated tax payment? If so, where will the cash come from? Students must compare actual and planned profits and investigate the cash flow dilemma. Issues include capitalizing purchases, distinguishing entities (identifying personal items in a business checkbook), calculating income taxes, and distinguishing between accrual and cash basis accounting.

In this episode, students:

- Stage 4: Distinguish between evaluating evidence and making judgments about people (questionable personal spending in checkbook);
- Stage 4: Determine the trade-offs between competing alternatives (profit and cash flow are not always equivalent);
- Stage 5: Integrate multiple perspectives, e.g., customer payment terms and vendor payment terms; and
- Stage 5: Interpret the context given probable but scant direct evidence, e.g., the owners probably do not have other income, which would affect their tax rate.

Episode 8: Finding the Missing Cash

In the final episode, students receive an urgent request from Sandy and Kris to figure out why the checkbook balance is so low. The larger agenda is for students to give Sandy and Kris guidance on improving their cash flow and creating a score card for monitoring the business to avoid unnecessary surprises.

The critical thinking demands require students to:

- Stage 3: Create explanations for using accounting information;
- Stage 5: Develop strategies for obtaining specific outcomes;

- Stage 5: Make trade-offs between costs and benefits, e.g., elaborate reporting may not be justified for a small partnership; and
- Stage 6: Model and explain how different interpretations may arise legitimately, e.g., how cash flow may not equate to high profit.

IMPLEMENTATION OF A BUSINESS SIMULATION

Using the Business Simulation in Introductory Accounting

The business simulation was implemented in the first course in an integrated two-course sequence in which managerial and financial topics were presented in the order of the business cycle of plan, operate, and evaluate. The simulation was worth 20 percent of the course grade, a proportion satisfying two objectives. First, the proportion was large enough so that declining to complete it would make a good grade unattainable. Second, the proportion was small enough to permit individual achievements (e.g., exams) to comprise the preponderance of the grade.

While the integrated approach fits the pattern of the episodes, the simulation could also be used to supplement traditional courses. At the rate of one episode per week, the simulation requires eight weeks of the term, leaving the balance of the course for other activities. For instance, a financial statement project (for user-oriented courses) or a practice set project (for preparer-oriented courses) would be a logical end-of-term assignment. In a management accounting course occurring after a financial course, the simulation would cumulatively reinforce both courses.

Textbook chapters along with traditional homework exercises are assigned to develop the skills required for the episodes as indicated in Appendix B for the learning outcomes in Table 2. Thus, the sequencing of chapters begins with the planning phases of the business cycle (estimating profits, designating fixed and variable costs, calculating breakeven levels, budgeting, and making special short-term decisions), progressing to operating phases (capturing transactions and organizing information for internal and external users), and evaluating the results of operations (evaluating variances, controls, and ratios).

Delivery on the Web

Students and instructors access the episodes and supporting materials on password-protected websites. Students and instructors had use of a web-based learning management system (WebCT) that supports time-stamped submission of completed work, an electronic bulletin board, and practice quizzes. The implementation of the course with the simulation and web-based tools is an example of initiating large-scale redesign of courses enabled by an institution's investment in information technology (Twigg 2000). Web access to the simulation facilitated its use in completely online sections of the courses.

Given the urban setting for the campus, the large number of enrollments per term (typically 800), and the number of instructors (typically ten or more), web access was highly effective. Instructors comprised tenure- and non-tenure-track full-time faculty, Ph.D. students, and part-time instructors. The mostly commuter-student population included minority, international, nontraditional, and part-time students.

Episode Management

Because the simulation requirements differed from typical freshmen college experiences, students benefited from an introductory discussion of each episode in class. For this purpose, it was helpful for students to examine episodes and supporting pages before the class discussions to identify what advice they were being asked to provide to their client, develop ideas about how to provide it, and notice which skills would be needed. These discussions prompted study of textbook pages or requests for mini-lectures from the instructor on specific concepts or procedures. The eight

TABLE 2
Learning Outcomes: Introductory Accounting

Context Question	Performance
1 For a specific business, what are the mission, strategies, and critical success factors?	1.1 Identify the mission and strategies 1.2 Identify critical success factors (e.g., balanced scorecard approach) 1.3 Relate critical success factors to the business's mission and strategy
2 For a specific business, what are the major opportunities and threats and how can they be managed?	——
3 For a specific business, what are the essential business processes?	3.1 In the context of a specific business, identify crucial business processes 3.2 Show how the business processes are related to each other and how they enable the achievement of the entity's mission
4 How does an organization assure that the information is reliable?	4.1 In the context of a specific business, identify the consequences of acting on unreliable information 4.2 For specific business processes, design business processes for acting on reliable information ensuring information reliability
5 How does an organization capture, represent, and process the information about operating, investing, and financing activities?	5.1 Identify business events 5.2 Record financial and nonfinancial data about business events, as transactions and in other formats 5.3 Aggregate business event data into useful information for decision making
6 What information is needed to plan and manage the important business processes and risks of financing an organization?	6.1 Recognize relevant aspects of operating, investing, and financing activities 6.2 Identify relevant measures for managing operating, investing, and activities
7 What information do stakeholders (e.g., assurors, citizens, consumers, creditors, customers, employees, investors, management, legislators, regulators, tax agencies, and trading partners) need and for what purposes?	7.1 Identify appropriate measures for evaluating performance from internal and external perspectives 7.2 Prepare reports 7.3 Compare operating results of business units using performance measures such as ROI, residual income, and EVA® 7.4 Compare operating results of business units to internal and external standards
8 How is information reported to stakeholders and how do they use it?	8.1 Prepare and use budgets and forecasts 8.2 Prepare and use operating reports 8.3 Prepare and use financial statements
9 How does information technology enable the capturing, processing, reporting, assuring, and use of information?	9.1 Word processing: Prepare written materials 9.2 Spreadsheet use: Construct spreadsheet models to perform sensitivity analysis; construct models with multiple sheets 9.3 Database: Extract information and analyze information 9.4 Database/spreadsheet/word processing: Export data from one and import it into another 9.5 Email: Send, receive, and manage email with attachments 9.6 Internet: Find relevant business information
10 How does the globalization of business affect business?	——
11 How do ethical dilemmas enter into business affairs?	——

episodes were rich enough to immerse students in realistic, meaningful business problems, but contained enough to permit instructors to make their own choices about much of the pedagogy. This approach left open the question of whether there is a single best approach. It suggests the use of multiple instructional methods to maximize the likelihood of students constructing their own problem representations and reasoning with them to acceptable solutions (Anderson et al. 1996).

The more engaged students became in the simulation, the more they appreciated that there were multiple valid approaches to each episode and no one "correct" solution. Instead, student submissions were presented to the class and reviewed together. Where class sizes were large, student groups were assigned one of the episodes to present, with or without advance notice.

Group Formation

For several reasons, students completed the episodes in groups of four or five students. The collective requirements were more work than many students wanted to attempt on their own, and instructors wanted to minimize grading time associated with large numbers of open-ended assignments. The most important reason for group work, however, is that collaboration with others is a powerful way to learn (Sharan and Sharan 1992; Bruffee 1999; Evensen and Hmelo 2000). Intellectual engagement with peers enables students to master complex concepts and reasoning that are initially beyond their independent ability (Sharan and Sharan 1992; Palincsar 1998; Bruffee 1999; Evensen and Hmelo 2000). Because it takes time to recognize and learn from the diverse perspectives arising from ethnic, cultural, gender, and racial differences that are instrumental in constructive problem solving (Guinier 2001), the groups stayed together through the term. When attrition reduced group size, instructors consolidated fragments of groups into new groups.

Communication Aspects

In general, students were unfamiliar with the kind of succinct, to-the-point writing called for in the memos to Sandy and Kris. They typically needed coaching on this kind of writing. Before the due date for the first episode, instructors prompted students with questions like: What would Sandy and Kris need to know? What information do you need to begin to find out? What information is missing or must be assumed? What if those assumptions end up wrong or Sandy and Kris want to change them? How can a businessperson decide whether a memo is clear enough? How can an advisor write in language that is appropriate for Sandy and Kris? Regardless, however, of the amount of presubmission coaching, students were more attentive to discussions of communications matters after they received their first marked assignment, which brought writing lapses to their attention. Students were also provided a sample memo and guidance for writing memos.

The communication aspect became more salient to students when they presented their advice to the class, which acted as the client. This reinforced the "student as expert" theme and motivated students to develop creative approaches without constantly trying to attain a correct solution. After students presented their approach, the instructor could make a range of submissions available, in class or on a website, to illustrate a variety of approaches to the business dilemma. To advance the critical-thinking aspects of each episode, instructors rewarded a range of approaches, citing the advantages and disadvantages of each strategy.

Assigning half the episode grade to communication emphasized the importance of developing communication skills. Realizing that brief business conclusions, not a college essay, are desired tended to increase students' motivation to participate. In fact, many students found writing a succinct message to be a significant challenge. They were forced to focus on the main message and include only the best guidance and arguments to support it. Figuring out *what to communicate* and not just which words to choose is an important communication ability that is broader than the development of basic writing skills.

Students benefited from reviewing samples of other students' submissions. Actual samples of student work without names can be used for this purpose, which makes the exercise authentic from the students' point of view. Writing has other pedagogical benefits such as the potential to make authors aware of what they know and still need to know, which is an application of critical thinking (Zinsser 1988). Because it is a manifestation of thinking, writing can enable learning (Britton et al. 1975; Emig 1983).

Spreadsheet Aspects

Students were encouraged to follow good spreadsheet design principles (e.g., separating input cells from calculations and designating them in color, basing calculations on input cells for parameters, making the sheets self-documenting so that the client could perform "what-if" analysis by changing input values, and formatting formal reports on separate sheets with balanced margins and coherent print areas). The cumulative nature of the episodes prompted students to realize that good spreadsheet design makes it possible to reuse spreadsheet segments. Furthermore, students learned to design spreadsheets with the audience's needs as important design criteria.

The episodes simulate business decisions where not all the facts are known and some must be ferreted out. Websites to explore for details, such as the Internal Revenue Service site for information about making estimated tax payments, were linked to the episode pages so that students could research items not neatly packaged in the textbook. This is a beginning point of luring students from their dependence on textbooks for answers to helping them develop confidence to seek relevant information from a range of authoritative sources.

Integrative Aspects

While none of the individual endeavors of building spreadsheet models, analyzing the effects of assumptions on decisions, resolving competing viewpoints, creating persuasive schedules to support advice, and developing communication skills are new in this simulation, documented attempts to integrate learning experiences for them together are scarce. What this simulation adds to prior work are an integrative framework based on constructivist principles and a demonstration that integration can be achieved complete with performance improvements (Springer and Borthick 2004a).

Changing Episode Expectations to Fit the Learners

The level of difficulty of this series can be adjusted by increasing or decreasing the requirements. Possibilities for increasing expectations are to:

- Require students to critique each other's episodes before grading them, orally in class or in writing outside of class;
- Have student groups present their conclusions to the class;
- Invite business guests to observe and comment on the presentations; and
- Select groups to present a specific episode randomly at the beginning of the class period of presentation.

Possibilities for decreasing expectations are to:

- Make check figures available;
- Provide more structure for episodes, e.g., by making a spreadsheet with the most difficult computations available or making assumptions explicit;
- Work the episode in class and provide a separate set of input values for the graded episode;
- Provide more detailed instructions that guide students into answering specific questions that help them organize findings; and
- Eliminate the requirement for estimated tax payments (Episode 7) or eliminate the requirement for designing a cash-tracking process (Episode 8).

Evaluating Student Work

The grading keys allocated half the points to the calculations and half to the advice memo. Consistent with the grading keys, episodes were graded on a points-off basis with partial credit. For problem areas, instructors commented directly on the students' spreadsheets in a different color font. The only exception to the points-off method was for student work attempting tasks more difficult than those required. While deep thinking beyond the calculations was encouraged, extensions beyond the scope of an episode received feedback and guidance, but no point penalty.

Episode work that was so difficult to read that individual error identification was tedious was given 50 percent credit and returned with the note "not easily readable." Because students were allowed to drop the lowest episode grade, this outcome was a warning to students with serious deficiencies to obtain assistance before the next episode. One of the advantages of the sequence of episodes was the opportunity for multiple chances for feedback and guidance to apply in the next episode.

Episodes containing a memo longer than one page were reduced one letter grade because part of the challenge of the episodes was to crystallize the important part of the message. Failing to limit the communication to one page was deemed a failure to exercise this skill and was cited as a major deficiency. Students were encouraged to explore with each other or the instructor how to revise their writing for the next episode.

FEEDBACK ABOUT THE SIMULATION

From Students

In general, from postings to the bulletin board, comments on end-of-semester evaluation forms, and email messages to the school, students sensed the difference in requirements compared to their prior courses. The reaction was bimodal. Some students were surprised and enthusiastic about the competitive advantage the new thinking abilities afforded. Other students were averse to stretching their capabilities. Like some of the students in Smith (2003), they would rather avoid the ambiguity inherent in solving real business problems. They would rather continue in the familiar mode—a good grade with minimal thought. More interesting than the initial bimodal distribution was the shift in some students over the term. Some students who resisted initially grew into supporters after realizing the developmental changes in their academic ability.

In spite of the serial arrangement of the episodes, students did not appear to experience carry-forward difficulties with the factual information in successive episodes (cf., California Car Company case [Adams et al. 1999]). There are several possible reasons for this. First, the volume of information in each episode was relatively small and was often repeated or changed in subsequent episodes. Second, carry-forward demands, by design, were more for thinking capabilities than specific information. In fact, students who did not construct their own understandings with each episode often realized well into the term that completing the next episode successfully depended on their having mastered the concepts and reasoning embodied in prior episodes. Although it is unfortunate that the realization of the cumulative nature of developing problem-solving ability occurred well into the term, the realization itself represents progress. Some of the students having this midcourse epiphany engaged themselves in the earlier episodes to catch up and others retook the course.

From Instructors

Instructors' initial reaction to the simulation ranged from "At last—activities that help students learn to think! Thank you! When will additional simulations be ready?" to "Students will have a hard time with this," to the most frequent "This is work. I don't have time for a new prep. Let's do the regular routine." Instructors with the first reaction immediately began suggesting ways to increase the learning potential of the simulation and its administration (e.g., improvements to the website, the

teaching notes, grading keys, and pointers on leading the introductory discussions of the episodes and staging student presentations for maximum learning). This response is consistent with the fundamental academic value of enabling students to learn to think critically.

The adverse reaction may result from several factors, including lack of confidence in one's ability to be successful in the classroom while making different kinds of demands on students. The adverse reaction may stem from the recognition that implementing the simulation with its shift from teacher as knowledge presenter to teacher as learning facilitator is disruptive of routine in several ways. First, using the simulation changes the way instructors use class time, i.e., instructors increase class time in coaching students and decrease time in lecturing. For instructors accustomed to lecturing, this may be a significant shift. Second, because they are unfamiliar with this approach to learning, students need time to adjust their expectations, which takes instructor time and effort. Third, teaching this way sets up an environment that guarantees that students will surprise instructors with their discoveries on a continuing basis. Instructors expecting to have "a finished repertoire of behaviors that, once achieved, will become routine, will be disappointed" (Shifter 1966).

The process of teaching the course with the simulation, however, prompted a shift in instructor reaction in those with initial hesitation. Higher requirements vest with instructors, especially in start-up mode. Once they saw the transformation of their students, who were engaged in learning in a different way, instructors realized the benefit in the critical-thinking approach. In fact, some of the instructors who were initially the most resistant have become the most enthusiastic. Now, suggestions for improvement (e.g., ways to reduce the grading burden, make episode grading more uniform across sections, and make technology support more responsive) come from most instructors. This shift in thinking and behavior over time is consistent with other reported disruptions in workplace practices in which proponents of a change might interpret the slowness of change as resistance. Affected individuals, however, see the change as prompting the need for negotiating new meanings for the changed practices, which takes time and experience (Prasad and Prasad 2000).

Some intriguing qualitative feedback about the performance implications of critical-thinking principles courses has come from instructors in subsequent courses. Instructors in the second introductory accounting course, in economics courses, and in intermediate accounting courses, some with no or little knowledge of the new course, have inquired about the new attitudes and abilities of students entering their courses.

With respect to quantitative evaluation of learning effects, an analysis of covariance adjusted for students' GPAs revealed two learning effects associated with critical-thinking principles courses (Springer and Borthick 2004a). First, exam scores in a junior financial accounting course were higher for students with critical-thinking experience in principles. Second, higher-achieving students enrolled in the first junior-level financial accounting course. Thus, even with respect to traditional learning objectives focused on knowledge mastery, critical-thinking principles courses appear to advantage students relative to traditional principles courses.

DIFFERENTIATION OF SIMULATION FROM EXISTING RESOURCES

In our opinion, the closest available teaching resources to the Safe Night Out simulation are the California Car Company (Adams and Pryor 2003) serial case and the Locator simulation (Springer and Borthick 2004). The California Car Company case, designed to help students "understand and appreciate the systems, processes, and integrated nature of business" (Adams and Pryor 2003, 643) applies only to the introductory managerial accounting course. Like Safe Night Out, the objective of the Locator simulation is to begin developing critical thinking in accounting by applying accounting concepts and procedures to business problems to give advice to clients. This simulation applies to both introductory accounting courses. Table 3 compares attributes of California Car Company, Safe Night Out, and Locator.

TABLE 3
Attributes of Available Case/Simulation Resources for Introductory Accounting Courses

	Attribute	Serial Case: California Car Company (Adams and Pryor 2003)	Business Simulation: Safe Night Out/Lee	Business Simulation: Locator: Part 1/Part 2 (Springer and Borthick 2004b)
1	Target course	One course: Introductory managerial	Two courses: Introductory accounting for financial and managerial	
2	Learning objective	"[U]nderstand and appreciate the systems, processes, and integrated nature of business" (Adams et al. 1999, 643)	Begin developing critical thinking in accounting by applying accounting concepts and procedures to business problems to give advice to clients	
3	Proportion of course	80%	20%/20%	20%/20%
4	Orientation	User decision making	Advice giving to client	
5	Pedagogy	Active learning	Constructivist learning experiences	
6	Activity unit	Individual and group	Group	
7	Student materials	Paper: 160 pages	Website: 20 pages/ 20 pages	Website and paper: 20 pages/20 pages
8	Production simulation	With building blocks	None	
9	Carryforward demand	Substantial but needed text repeated	• None for simulation facts • Substantial for skills developed	
10	Assessment	See Adams et al. (1999)	See Springer and Borthick (2004a)	None available
	• Performance	None reported	Exam scores better in a subsequent course	
	• Student reaction	Generally positive	Bimodal: • Some enthusiastic about their new thinking abilities • Some averse to stretching their capabilities	
	• Faculty reaction	• Ranked case high • Viewed case as an effective learning tool	• Were delighted with students developing higher-level thinking capabilities • Wished grading episodes were less time consuming	
11	Adoption source	South-Western	None	South-Western

OUTCOME: A CONSTRUCTIVIST APPROACH TO INTRODUCTORY ACCOUNTING

The business simulation approach revealed in this article gives students opportunities to begin practicing the higher-level thinking that business and the accounting profession demand. In a business simulation, the learner identifies problems, finds relevant information, acknowledges the influence of uncertainties on potential solutions, and then communicates findings to the target audience—the client. In each episode, students are immersed in an evolving enterprise, providing advice for business owners. Cast into the role of "experts," students assume the voice of business advisors, taking cues from the business owners rather than directions from their instructors. Engaging students this way requires that instructors shift some of their behavior from dispensing knowledge to helping students construct their own mental representations of the business and how it operates, and, especially, how it *could* operate.

An important question in the life of an innovation is whether, once it has become the new "normal," it was worth the effort. In the project described in the article, the answer truly is "yes." Administrators at all levels of the university supported and encouraged the transformation of the introductory accounting courses, which are among the large enrollment sequences perceived to be on the critical path to enabling students to develop the thinking abilities that constituents are demanding from baccalaureate graduates. Such courses are the focus of efforts to bring accountability to education providers.

One result of the transformed introductory accounting sequence is that it has provided the foundation for redevelopment efforts for other courses in the accounting major and in the master's programs in accounting. The simulation discussed in the article has been the starter for others to begin transforming downstream courses to shift them from teachers transmitting knowledge to students constructing their own understandings of the subject matter. We postulate that these constructed understandings will endure far longer than the mechanical, ritualistic computations and vocabulary that have long been the mainstay of introductory accounting courses.

APPENDIX A

Safe Night Out (SNO) Episode 1: Student Materials and Solution Sample

Learning Objectives

	A successful learner will be able to:	Skills required:
1	Use product, price, cost, and market demand, and decide if the product is feasible.	1. Identify variable and fixed costs. 2. Select relevant information. 3. Analyze feasibility of product using price, market volume, minimum earnings, and fixed and variable costs.
2	Decide how each element of cost and price affects product profitability.	1. Calculate profit and contribution margin and contrast the two.
3	Explain how sales volume and cost structure assumptions would likely affect profitability per unit.	1. Analyze profitability implications of changing assumptions and forecasts. 2. Report results of analysis to internal and external users.
4	Create a spreadsheet (in good form) to compute and update: 1. The profit per unit based on a variety of sales volume estimates 2. Monthly earnings based on a variety of sales volume estimates. 3. Breakeven sales and units given target profit estimates.	1. Create models using technology tools. 2. Create schedules to highlight observations and facilitate reader comprehension of conclusions.
5	Identify the important assumptions that drive the conclusion about product feasibility.	1. Analyze profitability implications of changing assumptions and forecasts. 2. Explain how fixed costs and sales volume assumptions are important to *per unit* profit calculations.
6	Write a professional memo (brief, clear, well-organized, without jargon) to a client that: 1. Summarizes the conclusions about product feasibility; 2. Explains how long it will take to reach the goals; and 3. Explains how changing sales volume estimates impacts both product profitability and length of time to reach the goals.	1. Report results of analysis to internal and external users. 2. Create schedules to highlight observations and facilitate reader comprehension of conclusions.

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APPENDIX A (continued)

Business Dilemma

Do you know where your car is?
Do you know how it's being driven?

How it all started...

Kris and Sandy, roommates at LeGrande State University, overheard their parents' friends talk about how they wished there was some way to let their teenage children, especially the new drivers among them, have access to family cars, but still have some assurance that their offspring were driving responsibly. By "responsibly," the parents meant that the drivers stayed within the speed limits and within the permitted geographical areas.

Kris had an idea: "You could create a tracking device that would be installed in the cars that would record the route and speed of the vehicle for 24 hours. The car knows how fast it's going, and the location could be obtained from a global positioning system (GPS). With just a little bit of programming, you could record the speed and location on a writable CD-ROM, which moms and dads could pop in their computer to see how their offspring were behaving (or misbehaving!)"

Sandy: "I hope you're not serious about this project—remember that last programming project you had—remember how long it took!"

Kris: "Yeah, well, I've learned better programming techniques since then."

Sandy: "Just think of the possibilities—the typical 'youthful driver' premium is $2,000 over the family rate per year. The automobile insurers that now offer 10 percent discounts for teenage 'good students' might offer discounts for student-driven cars that had such a tracking device. Wonder what this kind of assurance would be worth to parents?"

Sandy and Kris couldn't quit thinking about the idea—in fact, they were late to classes the next morning because they stayed up most of the night thinking of the possibilities. Before the night was over, they'd thought through the materials that would be needed (GPS tracker, serial cable, CD-ROM disk), the programming that would be required (Kris would do it with Sandy testing it), and how they'd sell it (on eBay on a commission basis). Here are the details [see below] they supplied.

A few days later …

Coming up for a reality check, Kris and Sandy realized they needed help figuring out whether their idea, which they were now calling Safe Night Out (SNO for short), was feasible. They knew you were taking an accounting course so they elected you to help them. (They'd helped you out of several jams, so how could you refuse?) They want to know what to expect. Specifically, they want to know:

1. How much profit would each SNO generate?
2. If Kris and Sandy wanted to earn enough to pay for school tuition, how many would they have to sell?
3. If they achieve the estimated sales each night on eBay, how much profit would they make in a month?
4. If they achieve the estimated sales each night on eBay, how long would it take them to earn LeGrande State tuition?

Requirements

Your assignment is to develop a spreadsheet that answers the entrepreneurs' questions. Include separate sheets for input, calculations, reports, and the advice memo. Make cells in the calculation sheet reference cells in the input sheet so that the calculation sheet updates with changes in the input sheet. Use the report sheet to summarize the most important findings for the client. In a one-page advice memo (prepared with a word processor), advise the entrepreneurs about the feasibility of their product. Import the memo into a separate sheet.

Details

Item	Estimated Cost
Materials	
GPS tracker	$150
Serial cable	$5
CD-ROM disk	$1
Sales assumptions	
eBay selling costs	$2.50 per item plus 5% of selling price
Selling price	$200
Estimated number of SNOs that would be sold each night	4
Other information	
Tuition at LeGrande State University, per student	$6,000

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APPENDIX A (continued)

Solution Sample: Grading Key, Memo, and Calculations

Grading Key

	Points possible		
	Presenting	**Report Only**	**Comments**
Communication content			
Clearly identifies problem: Price and sales volume are key assumptions	10	10	
Explains how contribution margin leads to estimates in profit and time to earn tuition	5	10	
Explains that outside factors can invalidate solution (might fall short of projected activity)	10	10	
Conclusion agrees with calculations and other evidence	5	10	
Remarks well organized and easy to follow	5	10	
Presentation			
Professional tone, polished and rehearsed delivery	5		
Message clear and not blurred by extraneous or gratuitous comments	5		
Handouts, visual aids all consistent and supporting main idea	5		
Subtotal for communication	**50**	**50**	
Technical content			
Correctly computes profit per unit	5	5	
Correctly computes number of SNOs to sell to earn tuition	10	10	
Correctly computes estimate of monthly profit	10	10	
Correctly computes time to earn tuition (days or months)	10	10	
Spreadsheet behavior			
Prints report professionally on one page (margin size even, header, footer)	5	5	
Contains input sheet without calculations and calculation sheet linked to input sheet	5	5	
Updates model correctly when input sheet values are changed	5	5	
Subtotal for technical content	**50**	**50**	
Extensions possible (give guidance but do not deduct for errors in attempting)			
Articulates how small shortfalls can dramatically change projection			
Explains that the introduction of fixed costs would change recommendation			
Gives a way to use the model going forward to re-analyze the situation			
Recognizes tentative nature of projection, i.e., no "right answer"			
Describes a range of conditions under which problem may change (pricing, costs, volume)			
Total score	**100**	**100**	

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APPENDIX A (continued)

Client Advice Memo

To: Sandy and Kris

From: Decision Modeling Partners

Date: January 25, 2002

Re: SNO feasibility

Your SNO business, based on your current assumptions, would be profitable. The table below shows the answers to your questions about profit and time to earn tuition.

Aspect	Sell 4 per Night Sales Price $200	Sell 3 per Night Sales Price $200	Sell 4 per Night Sales Price $180
Profit per SNO	$31.50	$31.50	$12.50
Sell this many SNOs to earn tuition	381	381	960
Days to earn tuition	96	127	240
Monthly profit estimate	$3,700	$2,835	$1,500

Take this report with a grain of salt. For instance, look at what happens if sales volume dips to only three SNOs per night: it takes another month of selling to earn tuition (middle column). More dramatic, however, is the effect of a dip in sales price. When you lower your price only 10 percent (right column), you go from approximately three months to earn tuition to eight months. Clearly price is more critical for you than sales volume at this point.

We would also like to caution you about sales volume. You currently do not have any fixed costs. If you incur recurring fixed costs such as rent or utilities that are independent of the number of SNOs you sell, your sales volume will become much more important to retaining profitability. Right now, you are profitable with the first SNO sold—you've made $31.50. If you have fixed costs, you have to sell enough SNOs to pay your fixed costs before you are profitable each month.

Please update the input sheet and see the impact of changes in sales volume, sales price, and costs reflected on the "active sheet" of the model. All of these assumptions are subject to change as you learn how your product is received in the market place. Our guidance is only as good as the assumptions that fed the model.

We look forward to an update of how your sales are coming along!

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APPENDIX A (continued)

Calculations

Profit per SNO	
Sales	$200.00
Variable costs	
Material	$156.00
eBay selling cost per SNO	$10.00
eBay selling cost on sales price	$2.50
Contribution margin	$31.50
Fixed costs	—
Profit per SNO	$31.50
SNOs to cover tuition	
Tuition amount	$12,000.00
Contribution margin per unit	$31.50
Number of SNOs to be sold	380.95
Number of SNOs rounded up to whole units	381
Monthly sales projection	
Sales	$24,000.00
Variable costs	
Material	$18,720.00
eBay selling cost per SNO	$1,200.00
eBay selling cost on sales price	$300.00
Contribution margin	$3,780.00
Fixed costs	—
Estimated monthly profit	$12,000.00
How long to pay tuition	
Amount of tuition	$12,000.00
Average profit per day	$126.00
Number of days to earn tuition	$95.24
Days rounded up to whole days	96

APPENDIX B
Course Learning Objectives by Week

Week		Learning Outcomes and Contexts	Learning Objective Codes (Table 2)	Domain Concepts	Business Simulation Episodes and Other
1	1	Analyze the functional areas of business and how each uses accounting information	3.1, 3.2	Business functions	
	2	Apply the basic concepts of accounting in determining profits, organizational structure, and effect of activities on businesses	5.1, 5.2, 5.3	Accounting concepts, business type, double-entry accounting	
	3	Determine the effect of global markets on a business	10	Global markets	
	4	Determine the effect of legal/ethical issues on a business	11	Legal and ethical issues	
	5	Access course websites and email instructor	9.6		
	6	Obtain a recent annual report and determine the core business activities	9.6		
	7	Search the Internet for information about careers in accounting. Write a brief report on findings	9.1, 9.6		
2	1	Predict profitability and break-even point for a start-up company	1.1, 1.2, 1.3, 2, 8.2, 9.2, 9.6	Selling price, cost behavior	SNO 1
	2	Determine the factors that influence selling price and how a company sets its pricing strategy			
	3	Apply the three cost behavior patterns to predict costs			
	4	Predict costs using the high/low method	6.1, 6.2	Cost estimation, CVP analysis	
	5	Use CVP analysis to determine the relationships among selling price, cost, volume, and profit			
	6	Analyze the changes in profits by altering fixed costs variable costs, and selling price.			
	7	Perform CVP analysis using a spreadsheet model	9.2		
3	1	For a specific start-up company, analyze how much credit is needed and how best to construct a persuasive spreadsheet to obtain financing	1.2, 1.3, 2, 6.1, 7.1, 8.1, 9.2, 9.3, 9.4	Information needs of stakeholders	SNO 2
	2	Distinguish between internal and external stakeholders and their respective needs for accounting information			
	3	Identify, analyze, measure, and classify accounting events	5.1, 5.2, 5.3	Accounting information system: financial and managerial	
	4	Use the management accounting system to communicate information to internal users			
	5	Use the financial accounting system to communicate the results of accounting events to external users	8.3	Financial statements	
	6	Obtain an annual report and analyze the contents for ownership, dividends, cash flow, profitability, new borrowings or repayments, and current assets/liabilities	9.6		
	7	Prepare a report that shows how a series of events has impacted the financial statements	9.2		
4	1	For a specific start-up company, obtain a monthly transaction file from Internet vendor, and analyze transactions for patterns and profitability	1.3, 2, 5.3, 6.1, 7.1, 8.1		SNO 3
	2	Identify the operating, investing, and financing activities of a business	5.1	Operating, investing, financing activities	
	3	Apply the principles of internal control to business transactions	4.2	Internal controls	
	4	Summarize the sequence of activities in the expenditure, revenue, and conversion cycles	3.1, 3.2, 4.2	Expenditure, revenue, and conversion cycles	

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APPENDIX B (continued)

Week		Learning Outcomes and Contexts	Learning Objective Codes (Table 2)	Domain Concepts	Business Simulation Episodes and Other
	5	Obtain the annual report of a public company and summarize the company's revenue, expenditure, and conversion (if applicable) cycles	9.6		
5		Exam			
6	1	For a specific start-up company, analyze impact of product modification, research and development, and reforecasting after changes in market response using four months of transaction history available on the Internet	1.1, 1.2, 1.3, 2, 3.2, 5.3, 6.1, 6.2, 7.2, 9.2, 9.3, 9.4, 9.6	Product and non-product costs, relevant variables	SNO 4
	2	For a specific start-up company, evaluate if new large customer meets their business strategy and their financing ability. Also, evaluate vendor choices			
	3	Analyze special operating decisions: special order, make-or-buy, process further or dropping a product line			
	4	Get the annual report of a public company and determine which of the special decisions in this chapter would the company face? What information in the annual report refers to such decisions?	9.6		
7	1	For a specific start-up company, project two years of leasing activity to determine financing requirements	6.1, 6.2, 8.1, 9.6	Budgeting	SNO 5
	2	Determine why and when budgets are used			
	3	Prepare budgets in the revenue, expenditure, and conversion cycles			
	4	Create a cash plan		Cash flows	
	5	Prepare cash receipts and cash payments budgets			
	6	Prepare cash receipts and cash disbursements schedules using a spreadsheet model	9.2		
8	1	Apply the objectivity, revenue recognition, and matching principles to business events	5.1, 5.2, 5.3	Accounting principles, accounting equation	SNO 6
	2	Demonstrate how a company uses the financial accounting system to identify, analyze, measure, and classify accounting events			
	3	Show how a company uses the financial accounting system to communicate the results of accounting events to external users	7.2, 8.3	Financial statements	
	4	Analyze the effect of accounting events on the accounting equation, net income, and cash using a spreadsheet model	9.2		
9	1	Define accounts and describe the role of debits and credits in a company's accounting system	5.1, 5.2, 5.3, 8.3	Accounts, debits and credits, accounting cycle	
	2	Explain and illustrate the steps in the accounting cycle			
	3	Prepare an unadjusted trial balance, adjustments, and adjusted trial balance using a spreadsheet model	9.2		
10		Exam			

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APPENDIX B (continued)

Week		Learning Outcomes and Contexts	Learning Objective Codes (Table 2)	Domain Concepts	Business Simulation Episodes and Other
11	1	For a specific start-up company, analyze a month of transactions and create a report to communicate profitability and to illustrate why cash balances are lower than owner expectations	3.1, 3.2, 5.1, 5.2, 5.3, 6.1, 6.2, 7.1, 7.2, 8.2, 8.3, 9.2, 3, 9.4, 9.6	Expenditures, expenses, and losses	SNO 7
	2	Compare/contrast expenditures, expenses, and losses			
	3	Describe how to record events involving the purchase of inventory in the expenditure cycle		Merchandise inventory	
	4	Apply FIFO and LIFO cost flow assumptions in valuing inventories			
	5	Communicate the financial effects of the purchase and use of goods and services to external and internal users		Financial statements, internal reports	
	6	Illustrate the effect of errors and distortions in the financial statements and on decision making	4.1	Errors/distortions in accounting	
	7	Using IRS Circular E, determine federal income tax and FICA withholding on a series of salaries	9.3, 9.6		
	8	Write a memo illustrating the impact of recording a sale prior to year-end but not reducing inventory on warehouse records until after year-end	4.1, 9.1, 11		
	9	Determine inventory amounts by changing accounts payable and inventory balance amounts in a spreadsheet	9.2		
12	1	Distinguish between revenues and gains	5.2, 5.3	Revenues, gains	SNO 8
	2	Determine how and when revenues are recognized	3.1, 3.2	Revenue recognition	
	3	Apply matching principles to account for sales adjustments	5.1, 5.2, 5.3	Contra-revenue accounts, uncollectible accounts	
	4	Estimate and record uncollectible accounts			
	5	Demonstrate how companies communicate the financial effects of revenues and related events to their external and internal stakeholders	7.2, 8.2, 8.3	Financial statements, internal reports	
	6	Illustrate the effect of errors and distortions in the financial statements and on decision making	4.1	Errors in accounting	
	7	Using the annual report of a public company, identify typical adjustments to revenues	9.6		
	8	Prepare an accounts receivable aging schedule and determine the amount of uncollectible accounts using a spreadsheet model	9.2		
13	1	Analyze product versus period costs during the conversion cycle	3.1, 3.2	Cost accumulation, conversion cycle	
	2	Determine how companies record and analyze materials- and labor-related events and manufacturing overhead events during the conversion cycle	5.1, 5.2, 5.3	Manufacturing inventories and costs, activity-based costing	
	3	Determine cost of goods sold and cost of goods manufactured during the conversion cycle			
	4	Explain how companies communicate conversion cycle events to users	7.2, 8.2, 8.3	COGM, income statement, balance sheet	
	5	Analyze the effect of errors made in the accounting records	4.1, 9.1		
	6	Prepare an activity-based costing analysis using a spreadsheet model	9.2		

(continued on next page)

APPENDIX B (continued)

Week		Learning Outcomes and Contexts	Learning Objective Codes (Table 2)	Domain Concepts	Business Simulation Episodes and Other
14	1	Use financial statement data to evaluate operating activities	6.1, 6.2, 7.1, 7.3, 7.4, 8.3	Financial analysis, including horizontal, vertical, and ratio analysis	Practice set
	2	Perform horizontal, vertical, and ratio analyses and interpret the results	5.2, 5.3, 7.1, 7.4, 9.3, 9.4, 9.6		
	3	For a selected public company, find industry averages. Then, calculate all the appropriate ratios for the company and compare to the industry. Determine the liquidity and profitability of the company	5.2, 5.3, 7.1, 7.4, 9.3, 9.4, 9.6		
	4	Find a company that failed or declared bankruptcy within the past five years using the Internet. For the five years PRIOR to the bankruptcy, calculate ratios and see if analysis would have discovered the upcoming trouble	4.1, 6.2, 7.4, 9.1, 9.3, 9.4, 9.6, 11		
	5	Analyze GAP Inc. sales' trends	6.1, 8.2		
15	1	Use financial and nonfinancial performance measures to evaluate the quality of products and processes	6.1, 1.2, 1.3, 6.1, 6.2, 7.1, 7.3, 7.4, 8.2, 8.3	Quality control, variance analysis	
	2	Use variances to evaluate direct materials, direct labor, and manufacturing overhead costs and how the determine which variances require additional investigation			
16		Exam			

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