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From Cases to Courses: A Design Process and Principles for Creating Effective Live Goal-Based Scenarios

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ABSTRACT

From Cases to Courses: A Design Process and Principles for Creating Effective Live Goal-Based Scenarios

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Research shows that the most effective way to teach learners targeted skills is to put them in the kinds of situations in which they need to use them and to provide experts who are able to advise learners when necessary (Schank & Cleary, 1995). Through this process, learners come to understand how and why they should use these skills in the real world. Researchers at The Institute for the Learning Sciences at Northwestern University constructed the Live Goal-Based Scenario (Live GBS), an instructional method for professional training, a live variation of the computer-based Goal-Based Scenario (Schank, 1994) in which learners are engaged in pursuing a goal within a simulated environment in order to learn a set of target skills. Live GBSs immerse learners in live simulations of authentic cases that allow them to give open-ended, creative solutions to problems and provide timely feedback from domain experts acting as role players in the scenarios.

More than 10 years of work developing Live GBSs has gone largely undocumented. This dissertation introduces a design methodology for Live GBSs of seven primary steps designed to provide a guideline for novice designers in an effort to help them construct and implement Live GBSs. Just as experts are needed within a GBS to advise learners, advice is also needed to provide information to novice designers. This dissertation provides a set of design principles extracted from lessons learned from successes and failures of Live GBS design that are needed to better inform the process of creating these simulations.

This thesis includes case studies of three Live GBS designs with data gathered from personal experience as a Live GBS developer, testimonials from Live GBS design architects, content and skills experts for Live GBS curricula design, detailed field notes, subject interviews, observations of two Live GBS implementations by clients, and 42 hours of video. The concluding chapter suggests a link between how closely a Live GBS design embodies the design principles and the perceived success of a Live GBS.

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CHAPTER 1:

AN INTRODUCTION TO LIVE GOAL-BASED SCENARIOS

The real world is messy. Professionals face complex, ambiguous problems. The analytical path and potential answers are often unclear. Traditional training methods offer little support for these situations. Corporations and public institutions are starving for a better way to prepare their professionals to handle the real world. Following is a discussion of training to address these needs.

Instructional designers have frequently turned to cases as a training method. Cases aim to present learners with the same types of problems faced by professionals. Learners face a complex situation requiring analysis, reflection, and discussion. They must shift focus from the explicit, decontextualized knowledge and skills of a traditional curriculum to the development of active knowledge.

This dissertation discusses how a Live Goal-Based Scenario (Live GBS) learning environment better handles training in such difficult environments. A Live GBS immerses learners in a live, human-led case simulation. Participants learn specific skills needed to solve a specific problem. For such complex problems, human interaction provides a superior learning environment. A Live GBS provides that human interaction in an intense, controlled manner. It provides a condensed version of reality in which timely help is given. A Live GBS provides a realistic, safe learning environment for the participants.

In describing the methodology for building Live GBSs, there are several iterations of designs, which instructional designers work to replicate. The methodology, however, is not enough for

designers to produce the ideal outcome. As Julian, Kinzie, and Larsen (2000) state, "novice designers frequently enter the workforce with an understanding of the instructional design process but without the knowledge base that can help them solve instructional design problems and develop solutions" (p. 165). Business and academic goals often conflict. As a Live GBS progresses, these conflicts and unexpected constraints arise and must be solved pragmatically. This dissertation suggests a set of principles to mitigate the conflicts. Together, the methodology and principles will allow instructional designers a launching pad from which to create the desired training outcome.

The Goal-Based Scenario

Instructors in all domains face a set of problematic issues and practices (Berman, 2001). Roger Schank (1995, 1997; Schank, Fano, Bell, & Jona, 1993) addressed these issues and identified a learning environment that counters these issues as a GBS. The GBS problem-solving process is authentic to the requirements of the real-world task and accommodates the process by which people effectively learn. The objectives of this dissertation are to:

Illustrate a method for building a Live GBS to best imitate life experiences and

Identify a set of "success" principles for Live GBS design.

GBSs were originally developed as computer-based simulations. These simulations, along with Live GBSs, are formed by eight essential components (Schank et al., 1993):

Mission: The primary goal that learners pursue with the GBS.

Cover story: The premise under which the Mission will be pursued.

Role: The character learners play while pursuing the Mission.

Scenario Operations: The activities learners perform in pursuit of the Mission.

Scenario Feedback: The reaction of the world and players within it to the actions of learners.

Nonscenario Feedback: Feedback from the mentor figure (instructor or coach) who is not in a fictional role, to teach explicit lessons and help learners construct accurate explanations for expectation failures.

Resources: Materials relevant to the case and instruction to assist learners in accomplishing their Mission.

Reflection: Learners engage in careful consideration during their training work (Schank et al., 1993).

The Live Goal-Based Scenario

The Live GBS extends the computer-based GBS, using live experts to guide teams through the general structure of the simulation. The experts facilitate group reflection allowing learners to construct accurate explanations for expectation failures. The experts act out roles based on their real-world positions and experience in the work environment. This infusion of real-world experience allows expansion on computer-based programs, which tend to limit the feedback and stories provided to learners. The live experts allow for personalized dynamic changes through reactions, advice, and reflection.

The Live GBS feels more realistic because it is realistic. It has the same physical setting and environment, the same resource-gathering process, and the same personal interactions the learner will face on the job. Experts acting in familiar roles provide the memories and stories that form the glue for the training. Learners face a dynamic experience of trial and error, successes, failures, and surprises. Belief is suspended to a degree and participants make decisions they would naturally make on the job.

Example of a Live GBS

A Live GBS for new business consultants might begin by placing the consultants in a typical business project. The consultant arrives at the office for an early morning kick-off meeting with a senior officer and other new consultants. The senior officer explains the parameters of the project—the client is struggling with the profitability of a certain product line. The client wants a clear diagnosis and action plan to fix the situation by the end of the week. The new consultants leave the room excited, confused, and most assuredly apprehensive.

New consultants are assigned to a small team of five to six people, with one experienced consultant acting as coach and mentor for the group. The team composition, although skewed toward new consultants, is similar to that of real projects. The team's mentor starts the process by defining a basic framework and rough analytical process to get the team focused. He solicits input from the consultants about their concerns and gets feedback on the clarity of the task ahead.

The team then will begin a series of problem-solving discussions that might include brainstorming sessions, data collection, team meetings, interviews with role-played clients and experts, analysis, and synthesis. The actual clients of the firm do not participate as role players. The schedule of activities is typical of a real consulting project and includes:

> A CEO interview to help give focus to the effort. Gaining comfort with and getting productivity from meetings with senior corporate officials are critical consulting skills.
>
> Meetings with functional experts to gather data and early perspectives. Creativity and clarity in data collection are critical skills that can determine success or failure for new consultants.
>
> Analysis based on gathered data. Data is usually discovered by the learners through the experts.

Team meetings to brainstorm opportunities, discuss hypotheses, and set direction. These will typically happen several times a day.

An interim presentation on Day 3 to present analysis and get feedback from the client and/or senior officer. Presenting with clarity, empathy, and focus can often distinguish the best consultants.

A final client presentation that incorporates input from the previous meetings and fresh analysis. Direct feedback from the client role players and senior consulting officer follow.

Obviously, role players are critical to the success of the Live GBS. They are actors playing familiar roles. They provide the real-time feedback and data needed for the team to make progress. They are given clear guidelines on how to accelerate team progress. The Live GBS typically accelerates a 3-month project into a 1-week timeframe. Experts play the role of "process accelerators," providing information and "seeding" hypotheses for the working team.

To broaden the learning experience, teams are encouraged to attend other teams' presentations. This allows for more observation of typical client interaction. After each teams' presentation, feedback and open discussions with experienced consultants, client role players, the training design team, and others who are involved solidify their understanding of key concepts and learning objectives. These meetings also allow the new consultants to provide feedback to course designers, operations staff, role players, and mentors.

Design Methodology for Building Live GBSs

Live GBSs are not self-producing. They require a great deal of work, active involvement from the host organization, and a disciplined approach. Specifically, the successful Live GBS requires following a proven methodology and ensuring that certain conditional principles are satisfied.

The following methodology was created and refined over a series of Live GBS designs. If followed, it significantly enhances the chance for a successful outcome.

Step 1: Form a cross-functional design team consisting of instructional designers and subject-matter experts.

Step 2: Define the learning goals of the Live GBS course by identifying skills and domain knowledge participants will need to learn.

Step 3: Identify a typical case with opportunities for learners to practice the learning goals to serve as a model case from which the Live GBS simulation is designed.

Step 4: Distill a narrative of events from documents and events of the model case.

Step 5: Create a fictional storyline with events and characters from the narrative to serve as the foundation of the scenario.

Step 6: Identify issues from the model case that can be mapped to learning goals.

Step 7: Build an infrastructure to support the implementation of the scenario. In this step, a number of components are addressed.

- Step 7a: Design culminating activities and reflection periods. Activities should not only mirror actual tasks and milestones that professionals faced but also focus on specific skill sets from which the learners will receive performance-based feedback. Reflection periods give learners the opportunity to extract abstract lessons from their Live GBS experience.

- Step 7b: Develop the roles and foci of mentors, coaches, and role players.

- Step 7c: Design and prepare the behind-the-scenes strategy area with a database of answers to anticipated questions from learners and monitors to unobtrusively monitor teams.

- Step 7d: Create a realistic physical environment to maximize the authenticity of the simulation.

- Step 7e: Use technological resources to aid the flow of the simulation. For example, if computers are normally used for communication (i.e., email, presentation graphics) or analyses, they will also be used in the Live GBS. In addition, video monitoring can assist coaches, role players, and mentors to assess performance, provide feedback, and anticipate questions and skill-set needs.

Step 7f: Create textual resources such as background information on the fictional client and the project. These resources need to be error proof, and both accurate and relevant.

Step 7g: Manage the logistics—location, calendar, and participants. Flawless logistics are critical to the learning environment.

What Makes Live GBS Designs Succeed or Fail

Adhering to the methodology is necessary for success but not sufficient. Based on training experiences, a set of principles is required for the desired outcome. If the principles are feasible and followed, the Live GBS is a superior training method. If not, alternative training approaches are probably better. These principles will be discussed in detail later, but two examples serve to illustrate the point.

One successful design was the development of a Practice Basics 1 (PB1) course for Millennium Technology Partners, a management consulting firm. The goal of the course was to teach skills in quantitative and qualitative analysis, domain knowledge, communication skills, technical skills, and Millennium's philosophy and approach to projects. There was a great effort to develop a realistic environment, exposing learners to real consultants, experienced role players as clients, and cases based on real projects. The learners had to interact with peers, senior consultants, working-team members, and senior executives. The learners were given the mission of diagnosing a real-life problem for a fictional client, and were required to go through the typical analytical process to achieve their mission.

A post-course survey was distributed to participants of the Live GBS to determine the effectiveness of the course. The survey was administered 6 months after the course, which

allowed all learners to participate in at least one "real" project before taking the survey. The results of the survey were positive:

> Sixty-five percent of participants believed the Live GBS contributed to their skill development and had a positive impact on their work in the field.
>
> More importantly, 70% felt their Live GBS experience had a strong positive affect on their ability to be strong consultants.

Comments from the participants provide richness to the positive impact of the course:

> "I thought the class was well run and well simulated. You did a great job of making us feel like it was a real client engagement. Having the [role players] as executives was very effective."
>
> "I really enjoyed the training, especially the live sessions with the [role-play] executives. It's nice to get out of the sterile classroom and experience some fairly realistic situations."
>
> "I learned what it was like on a day-to-day basis to be a consultant at Millennium[1]."
>
> "I really enjoyed every bit of it, including getting our head handed to us for being too aggressive with our 'client.' Scott's comments [as a role player] were on the money. Would rather learn it this way than in [a risky] real-life situation."

A contrasting experience occurred with the Live GBS designed for the Government Health Association (GHA) Chief of Staff (COS) Institute. This 2-day Live GBS was part of a week-long training conference for COSs of veterans hospitals. Recently reorganized into regional networks, each hospital had to work with others to make previously independent decisions, including budgetary and organizational changes. The Live GBS was intended to train the COSs how to:

[1] For confidentiality, the actual client names have been changed.

Develop negotiation and conflict management skills around resource allocation with internal hospital and network stakeholders;

Develop leadership skills to manage organizational and cultural change;

Identify and analyze the data relevant to the consolidation and/or integration of a service; and

Develop and justify service consolidation and/or an integration strategy through negotiations with other COSs on the hospital network team that address quality of care and service, regional operating costs, and staffing issues.

A postcourse survey revealed a less than positive response from the participants. Typical Learners' comments from the course survey follow:

- "[Provide] better access to the data."
- "Make changes more difficult [for us] to achieve; [we] COSs are not new."
- "Place a higher risk on participants."
- "Eliminate data-collection aspects."
- "[We needed] more group and individual feedback."

So what went wrong? The errors were fundamental. Designers strayed from the design path. Although the seven steps of the design methodology were used in the Live GBS, circumstances and resources were not controlled in the design. For reasons discussed in later chapters, this course design resulted in a slow, archaic data-gathering process. In addition, the physical environment was unrealistic and did not allow for easy communication between teams, experts, and the staff. Reflection sessions were absent from the simulation, and the learners did not receive adequate expert attention or feedback during the data-gathering process.

The design principles delineated in this dissertation, developed based on the implementation of the Live GBSs, cannot be overlooked. For example, the implementation of reflection sessions during the simulation is critical. The GHA Live GBS was the first—and last—not to have these sessions, resulting in frustrated participants. They did not know the purpose of some of the tasks they were being asked to perform, nor did they understand that the data they were given was purposely limited in order to mirror the "messy" data they would be given on the job.

GBS designers not only need to follow the critical path of the methodology, but also need to ensure that the design principles are followed in the design. Implementing reflection sessions is one of these principles. These sessions allow for short-term changes to the simulation, and allow learners to interpret the abstract lessons of the simulation to the real world. The sessions also allow for real-time clarification and feedback, important elements of success. There are 19 design principles in all that will be introduced in a later chapter. These principles allow participants to maximize the learning from these real-world problems.

Roadmap for This Dissertation

The remainder of this dissertation will unfold as follows:

In Chapter 2, I will discuss some of the cognitive and pedagogical theories supporting Live GBSs. This also includes a comparison between Live GBSs and a similar instructional design model for Problem-Based Learning. In Chapter 3, I will explain the seven steps of the design methodology.

In Chapter 4, I will illustrate these seven steps by looking at three implementations of Live GBS designs— Millennium Consulting's Practice Basics 1 course (PB1), Millennium Consulting's

Practice Basics 2 course (PB2), and the GHA's COS course. The learners for Millennium Consulting's courses were management consultants with various levels of experience, from novice to partner with several years of expertise in the field. In PB1the target learning goals ranged from domain-specific knowledge restricted to Business Process Re-engineering to skills related to the general practice of business consulting. These skills included data analyses and soft skills such as team dynamics, interviewing, and giving formal presentations. Basic industry knowledge involved areas of business process and organizational redesign, and information systems strategy and development. The mission was to find areas in the fictional client company that negatively affected efficacy and recommend a strategy to fix the problems.

PB2 targeted learning goals were better defined than those in PB1, but were all related to project management. The mission was to salvage the client's implementation efforts. The story picks up 6 months after the PB1 scenario. The premise is that the fictional client took the Millennium team's recommendations and instead of hiring the consulting firm to implement the changes, the client tried to do it themselves to no avail, and now they need to correct errors and properly implement the original recommendations.

The learners for the GHA COS course were COSs who were relatively new to the position. The target learning goals were to develop negotiation and conflict-management skills and to identify and analyze relevant data. The mission was to develop a service consolidation strategy through negotiations with other COSs on the hospital network team.

In Chapter 5, I will introduce and explain 18 principles for success of Live GBS designs. These principles are based on experiencing nine Live GBS designs, over 40 hours of videotape, and interviews with 15 designers, mentors, and role players. These principles are critical for success

and align with pedagogy and cognitive-science research on memory and learning. In Chapter 6, I will discuss the post-Live GBS surveys and suggestions for future work with Live GBS.

The design methodology and principles for success provide the basis for a new and improved method of training. Participants will learn critical skills and be better prepared to handle the disorganized nature of their real-world experiences.

CHAPTER 2:

THEORETICAL SUPPORT FOR THE LIVE GBS LEARNING ENVIRONMENT

All education involves some sort of problem solving or preparation for problem solving; from mathematical calculations (what does this equal?) to science experiments (how does this happen?) to analyzing any input we are given (what does this mean?). Educators show learners how to answer questions and solve problems. When schools start handing facts and procedures to learners without giving them a chance to develop their own questions and investigate by themselves, learners are likely to memorize material without fully understanding how to use it (Bransford, Brown, & Cocking, 2000).

This chapter will relate the features of the Live GBS to computer-based GBSs and to Howard Barrows' (1985) model of problem-based learning (PBL) as these are learning environments with the most similar characteristics to the Live GBS. This is followed by a discussion of how the Live GBS model is influenced by learning theories based on situated cognition and case-based reasoning (CBR). These perspectives provide a theoretical basis and pedagogical support for the design of Live GBS learning environments. The combination of these influences provides a foundation for designing a Live GBS learning environment that helps learners internalize learning, leading to greater comprehension.

Characteristics of a Live GBS

Research in learning and cognitive sciences shows that the most effective way to teach learners new skills is to put them in the kinds of situations in which they need to use them and to provide experts who are able to advise learners when necessary (Schank & Cleary, 1995). When this

happens in a learning environment, learners come to understand when, why, and how they should use targeted skills in the real world (Dewey, 1913, 1938). Schank and Cleary (1995) have argued that the design of such a learning experience takes the form of a storyline in which learners play key roles. The roles learners play reflect those that people in the real-life situation might actually do. This is the idea behind the GBS constructed by Roger Schank and his team (Schank et al., 1993). GBSs are designed to include a meaningful context for pursuing goals, in which the student's activities are both engaging and plausible with respect to the goal the student is pursuing. Because a Live GBS is derived from the computer-based GBS model, it is composed of roughly the same characteristics as a computer-based GBS with some differences in feedback and implementation. There are seven general components of a GBS: the *learning goals*, the *mission*, the *cover story*, the *role* of the learner, the *scenario operations*, the *resources*, and the *feedback*, including coaches and experts (Schank et al., 1993).

The *learning goals* are what we want GBS participants to learn. These generally fall under two categories: process knowledge, knowing how to practice skills that contribute to the end goal; and content knowledge the data learners need in order to achieve the stated goal.

The *mission* is the motivating goal that learners pursue. To complete the goal successfully requires the use of the target skills and knowledge.

The *cover story* is the background storyline of the scenario (or simulation). It is often a dilemma that creates the need for the mission to be accomplished. This and the mission need to be personally motivating for learners so they will actually care about completing the goal successfully. It should also have enough opportunities in it for learners to practice the target learning goals.

The *role* defines who learners will play within the cover story in the scenario. In designing this element of the GBS, it is important to have the target skills in mind and think about what role is best in the scenario for learners to practice the target skills. The role should be realistic and exciting for learners to feel truly motivated to succeed.

The *scenario operations* are all of the activities and tasks that learners undertake in the scenario storyline as they work toward completing the mission. This could be asking experts for opinions in an effort to build an argument for or against a possible solution, compiling data for analyses, or anything that helps learners move toward achieving a goal. The designer plans these activities so learners will have the necessary resources when it is appropriate to use them. The scenario operations are also constructed so that learners' actions and decisions have positive or negative consequences that reinforce target learning points. This is where learners are the primary architects of their own learning. Within the scenario, little time is spent discussing the scenario details and more time is spent practicing target skills and knowledge in service of the end goal. Although the goal is to have a good deal of opportunity for the learners to practice, and although the scenario tries to be rich with information to manipulate, the learners are encouraged not do more than necessary to achieve the end goal.

The overarching purpose of *resources* in a Live GBS is to provide the information learners need to achieve the goal of the scenario mission. Resources in a Live GBS come in one of two forms. The first type comes from tangible references such as literature, databases, video, and other material containing domain-relevant data that learners can access and use as they work through the scenario. Some of this data can be given as background material provided before the scenario to help learners acclimate to the domain.

The second type of resource is stories. Coming from the case-based reasoning (CBR) theory, we form cases through experiences and memories that contribute to our mental library of cases in the form of stories of specific events. The same can happen when we hear stories from other people about their experiences. We listen to their stories and index their experiences and expectation failures in the context of our own experiences and expectation failures (Schank, 1994). This is why it is important to have role players with real-world experience in the roles they are playing. When they provide timely feedback to learners and back it with a story, their experience gives the feedback authenticity and the story is one that the learners can index in the context of the feedback action.

Feedback can be given in one of three ways. The first is as a consequence of actions as learners perform tasks in a scenario. When they make a mistake or are successful, the response from the characters and events in the scenario simulate positive or negative consequences as a direct result of learners' actions. The second method is through just-in-time feedback from coaches offering advice when needed as a resource for scaffolding learners through various tasks (Collins, Brown, & Newman, 1990). The third type of feedback is from role players and mentors who, as experts, relay stories and lessons learned to students in response to their actions (Schank, 1982a).

Differences Between Live and Computer-Based Goal-Based Scenarios

A Live GBS is a human-led GBS in which learners work in small groups in the scenario with the help of supporting materials and resources. These resources include content experts acting as group mentors who are available to answer questions and guide learners when needed (Schank, 1991, 1997). Although both a Live GBS and a computer-based GBS teach targeted skills, a Live

GBS is better for teaching skills learned through actual human interaction, be it working collaboratively in a team or relating to role players in the scenario.

In order to function successfully in society and in business one must learn reasoning strategies, communication, and other human-relations skills. We usually learn to solve problems and get along with others as we go through life. As we interact with others, we learn implicitly what works and what does not through experience; that is, through our mistakes and successes. We are constantly practicing and refining these skills through real human interaction (Schank, Berman, & Macpherson, 1999). Given the infinite nuances of human relations, computer-based GBSs with a finite database of feedback and responses cannot satisfy dynamic demands as well as true interpersonal interaction can.

Human-relations skills do not have to be explicitly taught as part of the scenario, but rather are learned implicitly as learners interact with each other and with role players. Human-relations issues inherent to working with others will tend to arise naturally in a Live GBS environment, allowing learners to exercise these skills implicitly and realistically.

Learners receive extensive interaction with real client executives and other authentic role players. The simulations are of real cases with detailed supporting materials to support in-depth analyses. Live GBSs also provide opportunities for two types of feedback from sources not present in computer-based GBSs. The first is timely, performance-based feedback from role players who interact with learners, mentors who model problem-solving processes, and coaches who observe interactions and presentations. As they perform tasks in the scenario learners receive feedback from experts at the moment, which is when they want the information. The expert is also a role player in the scenario, adding to the authenticity of the environment.

Successes and failures in their performance and from role players' feedback provide Live GBS participants with lessons learned in a way that they will be most likely to remember for later use when they need it in their work.

The second type of feedback is provided through reflection. Opportunities for reflection occur through either facilitated discussion sessions or individual and small group discussions with coaches or mentors in which learners have a chance to decontextualize their experiences and the mentor or coach can help them understand how that knowledge and skill can be used in other situations (Collins, Brown & Newman, 1989).

A goal of Live GBSs is to be implemented in authentic environments. Live GBSs use real people with context and content-relevant background as role players in order to provide learners with timely feedback that can change dynamically with the simulation. The Live GBS infrastructure is supported by people working behind the scenes in conjunction with mentors, coaches, and role players in order to provide data requests from learners, feedback from fictional role players, a place in which coaches and mentors can collaborate on developing individual learner's and group skills, and administrative support to keep the simulation running smoothly.

An advantage to using a computer-based GBS is that the learner works alone, allowing for failure without embarrassment in front of peers. Additionally, the same computer program can be used once or many times over, and world-class experts can be mentors or coaches for the GBS through videotape. The disadvantage of implementing computer-based GBSs lies in the fact that videotaped experts have a finite set of responses to provide as feedback, and the same things happen each time you run a computer-based GBS.

There are advantages and disadvantages to Live GBSs as well. They are initially cheaper to design (although more expensive to implement) than computer-based programs because one does not have the additional costs of programming and graphic design. They seem more realistic because learners are in as close to the real-world environment as possible. In addition, different things happen with each run of the simulation, given the infinite ways people can interact with each other and the dynamic nature of the Live GBS. And similar to computer-based GBSs, if you can afford to have them, world-class experts can be role players, coaches, or mentors.

The disadvantages to Live GBSs will be discussed further at the end of chapter 3. These include the costly human resources inherent in each implementation and the problems that can occur when learners work in groups or make public presentations. Sometimes failure can be embarrassing. For example, at the end of a final presentation of a Live GBS simulation, one presenting team, all part of a management consulting firm, forgot to ask for the job. Unfortunately the CEO of the learners' consulting firm was sitting in on the presentation. Visibly upset, he told the team that the omission would have cost them the project. Thus the team, nervous to present in front of their own CEO in the first place, was embarrassed by their error.

Problem-Based Learning and the Live GBS

The Live GBS approach to learning is similar to many approaches to learning that situate learning as a meaningful task. Case-based instruction (Kolodner & Guzdial, 2000; Williams, 1992), anchored instruction (Bransford, Sherwood, Hasselbring, Kinzer, & Williams, 1990; Bransford & Stein, 1993), project-based learning (Blumenfeld et al.,1991), and problem-based learning (PBL) (Barrows & Tamblyn, 1980; Williams, 1992) are all approaches similar to the Live GBS because these approaches stress the importance of practical experience in learning.

PBL, however, is an approach quite similar to Live GBSs, particularly the model of PBL developed by Howard Barrows for preclinical medical students. In PBL, students learn by solving problems and reflecting on their experiences in the learning environment (Barrows, 2000; Torp & Sage, 2002; Hmelo-Silver, 2004).

Learners who are taught through PBL become self-directed learners with the desire to know and learn, the ability to formulate their needs as learners, and the ability to select and use the best available resources to satisfy these needs. Barrows and Tamblyn (1980) defined PBL, as "the learning that results from the process of working toward the understanding or resolution of a problem" (p. 18). They summarized the process as follows:

1. The problem is encountered first in the learning sequence, before any preparation or study has occurred.
2. The problem situation is presented to the student in the same way it would present in reality.
3. The student works with the problem in a manner that permits his ability to reason and apply knowledge to be challenged and evaluated, appropriate to his level of learning.
4. Needed areas of learning are identified in the process of working with the problem and are used as a guide to individualized study.
5. The skills and knowledge acquired by this study are applied back to the problem, to evaluate the effectiveness of learning and to reinforce learning.
6. The learning that has occurred in work with the problem and in individualized study is summarized and integrated into the student's existing knowledge and skills. (Barrows & Tamblyn, 1980, pp. 191–192).

Like Live GBSs, PBL is experiential learning focused on and organized around the investigation, explanation, and resolution of meaningful problems (Barrows, 2000; Schank, Berman, & Macpherson, 1999). In both PBL and Live GBSs, learners work in small collaborative groups

and learn what they need to know in order to solve a real life, difficult problem. In both, the "teacher" acts as a facilitator to guide the learners through the learning process. In PBL, this cycle is called the tutorial process (Barrows, 1985). In this process, the learners are presented with a problem scenario and identify relevant facts from the scenario to analyze the problem. As they begin to understand the problem, they are able to generate hypotheses about possible solutions. As they identify facts, they also identify relevant "knowledge deficiencies" (Hmelo-Silver, 2004) or information they need to know in order to solve the problem. These become learning issues the learners research during their self-directed learning. Then they apply their new knowledge in order to evaluate their hypotheses.

In PBL, there is usually a student chairperson, scribe, and reader of the problem. In Barrows' model the learners may have two shared whiteboards in the room. One is used to record a summary of their discussion under headings such as Ideas/Hypotheses, Facts, Learning Issues, and Action Plan. The other whiteboard is used to record other work related to solving the problem such as flowcharts or diagrams. The PBL whiteboards help scaffold the learners' problem solving by communicating the PBL process as well as serving as an external memory aid (Kolodner, Hmelo, & Narayanan, 1996). A possible drawback to using traditional whiteboards is that the information they carry is short-lived: learners write on them during one phase of the problem-solving process and then the record of their previous deliberations is gone. Depending on how well the scribe records the problem-solving process, learners may not consistently be able to go back to their previous experiences and consider how their earlier problem-solving might bear on their current situation.

A comparison of the six major points in Barrows' PBL process (Barrows, 1985) to common elements in Live GBS design shows that despite having many similarities they have meaningful differences.

1. PBL: The problem is encountered first in the learning sequence, before any preparation or study has occurred.

This is true for Live GBSs as well. In GBS theory, expectation failure is an important part of the learning process. In Live GBSs, for example, learners walk into the simulation with their own experiences, expectations, and explanations of how things work. It is through experience that expectations are formed. Sometimes, when things do not result as planned, expectations fail. When expectations fail, explanations that form the lessons learned from the failure become important. Explanations from expectation failure help properly index any experience to future situations or cases. One cannot effectively learn how to do things when they are just being told what they should know (Schank, Berman, & Macpherson, 1999). This is why in Live GBSs the learners are introduced to the mission they will be facing without much preparation or study. Sometimes they will be given a little background information that will help them better understand scenario-related circumstances affecting their in-role situations before being formally introduced to the scenario, but it is more effective for learners to walk into the live scenario with expectations garnered only from their own experiences. They will then have expectation failures and explanations of the failures within the context of an authentic problem in a realistic scenario with a high probability of being appropriately indexed and recalled in later situations.

2. PBL: The problem situation is presented to the student in the same way it would present in reality.

There is a difference between Live GBSs and the PBL rubric here. In Barrows' description of a PBL module design for medical school, the students were given an initial orientation session about the course, its objectives and teaching methods. Then the students were presented with a new patient case. Each case began with a brief written statement telling the patient's name, age, gender, chief complaint, and site of the interaction. Subsequent pages reported the patient's history, physical examination results, the results of laboratory tests and other diagnostic procedures, progress notes, diagnosis, treatment, and long-term follow-up. The students and a facilitator settled in around a table, laden with a large number of books. They approached the new case by deciding who will read, who will "scribe," and if appropriate, who will do some role playing during the meeting. This does not necessarily project the way actual clinicians would be presented with a patient; Barrows addressed this by stating that the facilitator or group's tutor should "help the group realize the inherent artificialities of the simulation they are dealing with" (Barrows, 1985).

In Live GBSs as in a PBL environment, the learners are in role as soon as they step into the scenario setting. For both learning environments this is not a role in the traditional sense of stepping out of one's usual position to experience a situation from a different perspective. In both, the learners are portraying the role or going through the simulation in the very position they assume in actuality. However, the learners in a Live GBS simulation are performing tasks and solving problems just as they would in real life in order to increase the probability of transfer of problem-solving strategies and of the problem-solving process itself. The mission and cover story of the scenario are presented to them by an appropriate role player as would happen in daily life. In the COS Live GBS, the mission was presented to the COSs by the head of the hospital network as the lead topic of a "meeting" with all hospital COSs, charging them with the

mission of recommending a solution to a budget dilemma. It is difficult to precisely replicate all aspects of reality in any simulation. There are artificial elements in a Live GBS simulation as well as in PBL environments. The difference between the two at this point in Barrows' rubric lies in Live GBS's mode of presentation of the problem as well as the roles the learners play on their teams.

In a PBL, the students are in the role that they would portray in actuality, however not all of the tasks are authentic to real-life problem solving. For example, the roles of reader and scribe in the first phase of the problem-solving process and the corresponding tasks, although pertinent to the problem-solving at hand, may not be directly transferable to the field of practice after the PBL course. However, this is not a criticism of Barrows' PBL model, because each problem-solving task is not necessarily designed to be an end in itself but rather a means to achieve a greater learning goal. In Live GBS, understanding the relationship between what they learned through their tasks and that of greater problem-solving goals is aided through reflection (Bereiter & Scardamalia, 1989).

The use of role players differs between the two models as well. Both models use role players as data-gathering resources at some point during their respective problem-solving process. The medical school PBL uses simulated patients played by carefully coached people who do not necessarily have backgrounds with similar personal experiences as the character they are portraying, but rather are trained to respond to questions and actions of PBL learners as authentically as possible. In diagnostic situations such as these, added personal experience of the role player is not needed in order to add a level of believability to the lesson. In a Live GBS,

authentic role players are ideal because the more "real" the role players are, the more they can bring to the role and share with learners.

The intention behind using role players with real experience in their roles in Live GBSs is to enhance the authenticity of the experience for learners and to create rich, dynamic feedback during the course. Authentic role players also have a mental library of experiential stories to call upon when they are reminded of them, either while in role or out of role, to support a teaching point. Authenticity in a role player can also lead to greater credibility. If the learners understand that the person playing an executive is in fact an executive of a company similar to the one modeled in the scenario, the probability of suspension of belief is increased as well as the credibility of the role player and the perceived value of their feedback.

3. PBL: The learners work with the problem such that their ability to reason and to apply knowledge is challenged and evaluated, appropriate to their level of learning.

One of the first steps in designing a Live GBS, once the target learning goals are realized, is to assess what the participants in the Live GBS already know about these goals. Sometimes, it is relatively simple to determine what the learners know if the anticipated audience for the simulation has a common background experience. For example, in the Live GBSs for management consulting, the learners had all recently graduated from business schools and had very little experience in the field of management consulting. Given this, the designers could make assumptions about what information learners would already have and what experiences and skills they would need to practice before joining their first real projects. Live GBS participants typically work in small teams with an experienced mentor who first models tasks to be performed and later in the scenario helps individuals and the team in an advisory role. This is done so the learners can work within their zone of proximal development (Vygotsky, 1978),

which suggests we design authentic tasks that are more difficult than learners can handle alone, but not so difficult that they cannot be resolved with the support of teachers or peers who can model appropriate strategies.

To make the best of the zone of proximal development in a Live GBS environment, the team mentor acts as a scaffold, providing the minimum support necessary for learners to succeed. The idea is to assist without denying the learners' need to build their own foundation. The challenge for the team mentor, then, is to find the optimal balance between supporting learners and pushing the learners to act independently. However, if instruction falls outside of the zone (above or below an individual's zone of proximal development), it is likely that no growth will occur. To effectively scaffold learners, team mentors and skills coaches stay one step ahead of them, challenging them to reach beyond their current ability levels.

4. PBL: Needed areas of learning are identified in the process of working with the problem and used as a guide to individualize study.

Target learning goals are identified in a Live GBS in the beginning of the design methodology. During the actual run of a simulation, unanticipated actions and reactions lead to new teaching points resulting in dynamic feedback. The role players and coaches work to be well-versed in their domains. If, for example, learners experience difficulty producing a deliverable for their project, the structure of a Live GBS allows for some flexibility within the scenario so role players can react appropriately to the situation to keep the atmosphere of the simulation as authentic as possible. The team mentor and coaches can use this or any unexpected reaction or consequence as a teaching opportunity individualized to learners and to the situation. The context within a Live GBS will cue learners' recall of the teaching point when a similar situation arises in the real world.

PBL has a strong emphasis on developing self-directed learning strategies (Hmelo & Lin, 2000). Live GBSs emphasize this as well; however the primary emphasis is on successful task performance. Because it stresses self-directed learning, PBL learners are more likely to use self-chosen learning resources than Live GBS learners. Live GBSs are designed to make the supporting resources readily available to learners. Reference materials such as books, databases, articles, and access to experts (real or role play) are available with clear pointers so learners will not have to interrupt problem solving for an extended period of time.

Ideas to be investigated are identified in the initial problem-solving phase in PBL in which learners collaborate in small groups and identify relevant information from the scenario they are presented. After they "formulate and analyze" the problem (Barrows, 2000) they form hypotheses about solutions and identify areas in which there is insufficient knowledge. These areas of "knowledge deficiencies" become issues learners research during their self-directed learning period (Hmelo-Silver, 2004). The use of a structured whiteboard is key to generate and structure the learners' problem solving. The teams in Live GBSs also create lists of information they know (on a PBL whiteboard this section is called "facts"), hypotheses (in PBL, this is listed as "ideas"), information they need to know ("learning issues" in PBL), and action plans. However, unlike PBL, these steps to problem solving in the various domains in which Live GBSs have been designed have basically emerged from conversations with experts in the respective domains. It can be assumed that a basic structure for problem solving can emerge from consistencies across domains. These consistencies can inform a more formal structure for the initial problem-solving phase of Live GBSs in the future. But for now the similarities in this area between the two learning-environment designs are incidental.

5. PBL: The skills and knowledge acquired by this study are applied back to the problem, to evaluate the effectiveness of learning and to reinforce learning.

   and

   6. PBL: The learning that has occurred in work with the problem and in individualized study is summarized and integrated into the student's existing knowledge and skills.

In Barrows' PBL model, time is largely unscheduled and unstructured, excepting the optional lectures, which, if they take place, do so on the same hour of each day (Barrows, 1985). The previous descriptions of PBL and Live GBSs do not necessarily mean to imply that there are no lectures in PBL curricula, but they usually take a different format and would take place after the initial problem-solving phase when learners transfer their hypothesis-driven strategies into self-directed learning. The fixed resource session is a popular format, which happens after teams have been working on the problem for a while. Here, if the resource person gives a presentation it is short. Most of the time is spent with learners asking questions relevant to the problem they are addressing and the general subject area while the resource person answers questions. In a Live GBS, the nature of the project simulation requires a timeline structure in which milestones are met in order for learners to produce the requisite deliverables they would create in real life. In a Live GBS, lectures and presentations would specifically refer to tasks or activities the learners are performing and provide them with basic tools necessary to handle some of the issues learners will encounter. The basic difference here is in the timing of these presentations. In Barrows' PBL, given the unstructured schedule in self-directed learning, lectures and presentations are not necessarily relevant to the immediate task at hand even though they are quite relevant to issues learners are exploring in the problem. In a Live GBS, the presentations are timed to coincide with tasks the teams of learners are working on in an effort to provide timely learning.

Differences in approaches to role players also come into play. In PBL, simulated patients are sometimes real patients, but most likely are actors or clinicians given scripts and background information to use in their roles. Also, the roles of patients are used as practice for making diagnoses and not part of a simulation of a larger case with interdependent pieces. In a Live GBS, it is important for the role players to be as authentic as possible. Although they too are given scripts to guide them in their roles in the scenario, it is the wealth of experience they carry within themselves that cannot be scripted and that allow them to react, in character, to the learners' actions and access cases from their own experiences to share with the learners at appropriate times.

Differences in the above two points can also be addressed by looking at facilitator roles, tasks learners perform, and reflection sessions offered in either learning environment. In both, the facilitator is an expert learner able to model good problem-solving and self-directed learning strategies (Hmelo-Silver & Barrows, 2003). The PBL model places more emphasis on the facilitator being able to scaffold learners through problem solving by making key aspects of expertise visible; they do not have to be experts in the content itself. In contrast the Live GBS team mentors, whose functions are in essence equivalent to PBL facilitators, are experts in the content. This can be problematic if the content experts are not well coached in the problem-solving strategies they are modeling or if they have difficulty making their expertise explicit to learners.

Tasks in a Live GBS build upon one another more organically than in PBL. Learners work within a single cohesive framework for the duration of the scenario; thus minimizing the need for repeated "incidental" learning of case materials (Bareiss, personal communication, January,

2006; Macpherson, Berman, & Joseph, 1996; Schank, Berman, & Macpherson, 1999). Also, learners are expected to make decisions, act upon them, and see the outcome of their actions. In contrast, classic PBL's foci are diagnoses and treatment planning, but the learners do not actually get to implement and see results.

In PBL, reflection is used to help learners understand the relationship between what they learn during the tutorial process and problem-solving goals. Each problem-solving task is not regarded as an end to itself, but as a means to achieve a self-defined learning goal (Bereiter & Scardamalia, 1989). In a Live GBS, each problem-solving task is performed in service of achieving an overarching goal to solve the scenario problem. Learning goals are not self-defined but rather predetermined, destined to be achieved through group collaboration as opposed to encouraging self-directed learning as one of the goals. PBL incorporates reflection several times throughout the tutorial process and when completing a problem. Learners periodically reflect on the adequacy of the "ideas" they have recorded on the whiteboard (Hmelo-Silver, 2004). At the close of a typical day in a Live GBS, skills coaches and team mentors meet with learners in small groups as well as individually to reflect on recently performed tasks. Through this forum individual teams will meet for informal reflection sessions. Team mentors and learners discuss lessons learned and address issues that require further attention including skills that the learners need assistance developing. Occasionally, at the end of the day, all teams participating in the Live GBS, along with the skills coaches and team mentors, will gather together and discuss issues encountered during the simulation.

At the completion of a problem in PBL, learners reflect on what they learned, how well they collaborated with the group, and how effectively they directed their own learning. After the

completion of a Live GBS team mentors and coaches facilitate reflection discussions in which they guide participants to extract lessons learned and abstract general lessons from specific ones that arose during the simulated scenario. This is followed by integrating these lessons into the larger view of how skills and tasks are performed, and into issues encountered during the scenario that learners are likely to experience in actual practice.

The following section discusses how the perspectives of two cognitive theories, situated cognition and case-based reasoning (CBR), concretely inform the design of Live GBSs.

Situated cognition and CBR complement each other well. Together, they provide perspectives on learning that powerfully influence the design of Live GBSs. In doing so, each supports the other. CBR adds a cognitive theory to some of situated cognition's practices by specifying learning through reasoning about real-world problems; and situated cognition provides a vehicle for putting CBR's cognitive theory into practice.

Situated Cognition as a Learning Perspective

Situated cognition suggests that learning is effective when it occurs in meaningful contexts. It emphasizes providing experiences in authentic as opposed to decontextualized contexts, and cultivating learning processes versus learning outcomes (Lave, 1988; Lave & Wenger, 1991). To derive implications for the design of Live GBS environments, two aspects will be addressed : the concepts of context and content, and the role of facilitation as they are represented in situated cognition theory and in Live GBS design.

The Concepts of Context and Content in Situated Cognition

Situated cognition recognizes the inherent significance of real-life contexts in learning (Bransford et al., 1992). Assuming this statement is true and knowledge is a product of relationships between learners and the environment, then learning is a result of learners engaged within contexts in which knowledge is embedded naturally (Bednar, Cunningham, Duffy, & Perry, 1991; Brown, Collins, & Duguid, 1989). This is reflected in approaches such as anchored instruction (Bransford et al., 1990; Cognition and Technology Group at Vanderbilt, 1990; Cognition and Technology Group at Vanderbilt, 1993) and cognitive apprenticeship (Collins, Brown, & Newman, 1989) in which learning is embedded in activity.

Anchored instruction lies within the situated cognition paradigm because small groups work together to understand and solve realistic problems. Anchored instruction is closely related to the GBS model and also resembles PBL, although it is less open-ended. Substantial independent research and data collection are not required in anchored modules as are required in GBSs and PBL. Most anchored-learning environments are embedded with all of the necessary data to solve the problem. Anchored instruction is a learning approach that stresses the importance of placing learning within a meaningful, problem-solving context.

Cognitive apprenticeship is another manifestation of situated cognition. It makes deliberate use of the social and physical contexts of a learning environment; thus making it in line with the assumptions and understanding of learning and cognition supporting situated cognition. Cognitive apprenticeship is structured much like traditional apprenticeships. In traditional apprenticeships the goal or task is often to make something tangible. In cognitive apprenticeship, the task is to form a process of thinking, something that is intangible. In the beginning, the

teacher models the skill or task at hand for the student. Most times the role of the teacher is to simplify tasks so that they are manageable for learners. This extra help is called scaffolding. Once they begin to learn the skill, modeling and scaffolding begin to fade. Fading allows learners to accomplish the task on their own, only asking for help when needed (Collins, 1996; Collins, Brown, & Newman, 1989).

The Influence of Situated Cognition in Live GBS Design

Situated cognition is reflected in Live GBS design as it attempts to place the learning activity in an environment that closely parallels a real-world situation, essentially in an authentic context that reflects the way that knowledge will be used in real-life. For example, Live GBSs seek to teach target learning goals by allowing learners to interact with actual experts or role players with the experience and expertise needed to carry out their roles. Therefore, Live GBSs situate the learning in simulated environments that mirror situations in which learners will be placed in the real world. The tasks they perform in the simulation are those they are likely to perform in real-world situations as well.

The role of context as presented in situated cognition and manifested in anchored instruction and cognitive apprenticeship is reflected in Live GBS design. The importance of context is evident in Live GBS design as unfamiliar skills are introduced and practiced in the context of accomplishing a goal or mission. An expert, in the role of mentor or coach, would first model the skill for learners. The learners would then model and practice the skill within the context of performing goal-related tasks in the scenario in the presence of the expert who, in turn, would provide feedback.

The Role of Facilitation in Situated Cognition

In situated learning environments, facilitation has assumed several forms: modeling, coaching and advising, collaborating, and using tools and resources to support student-driven learning.

Modeling

An important function of modeling in situated cognition is that of scaffolding. Scaffolding is a process of guiding learners from what they presently know to what is to be known. It allows learners to perform tasks that would normally be slightly beyond their ability without assistance and guidance from the teacher. Appropriate guidance can allow learners to function at the cutting edge of their individual development. According to Vygotsky (1978, 1986), learners' problem-solving skills fall into three categories: skills that the student cannot perform, skills that the student may be able to perform, and skills that the student can perform with help.

In a Live GBS, team mentors initially model problem-solving tasks that the learners will have to undertake. In the first day(s) of the Live GBS simulation, mentors may accompany small groups as they initiate diagnostic activities, but as the week progresses, the mentor becomes less intensely involved and more advisory.

Coaching and Advising

In situated cognition, advice and guidance help learners make maximum use of their own cognitive resources and knowledge. Learners have to have the opportunity to experience their own decision-making process and problem-solving strategies. In this sense, guidance and advice are implicit rather than explicit, and nondirective rather than directive, being provided when

needed by learners. Coaching involves observing and helping individuals while they attempt to learn or perform a task. It includes experts directing learners' attention, reminding them of overlooked steps, providing hints and feedback, challenging and structuring ways to perform tasks. The coach, as an expert, explains activities in terms of learners' understanding and background knowledge, and provides additional directions about how, when, and why to proceed.

In Live GBSs the experts, in the roles of team mentors, coaches, or role players, also identify misconceptions or errors in learners' thinking and help to correct them. When coaches are used in a Live GBS, they can advise learners regularly to provide one-on-one and group feedback based on direct observation of activities in the scenario. This advice is given through just-in-time feedback from coaches offering advice when needed as a resource for scaffolding learners through various tasks (Collins et al., 1990). Another type of advising comes from role players and mentors who, as content experts, relay experiential stories and lessons learned to students in response to their actions in the scenario.

Collaboration

Collaboration is inherent in everyday interaction. Individuals attempt to solve problems by interacting with other people using socially provided schemata and contextual cues. In cooperative learning, students learn to negotiate meaning with others and experience shared responsibility for learning. Students clarify, elaborate, describe, compare, negotiate, and reach consensus on the meanings of various experiences (Hooper, 1992).

In a Live GBS the learners are constrained to work within a scenario crafted by instructional designers. Learners are given access to the resources needed to figure out what they need to know in order to solve the problem presented. They also collaborate in teams to interpret data gained through interviews and other resources and, using consensus, decide how best to incorporate them into the goal at hand. They are able to construct goals within this framework that will enable them to explore ways to find a viable solution to their proposed mission, with guidance from team mentors that prevent them from greatly deviating from the critical path.

Resources to Support Student-Driven Learning

Situated learning environments provide tools and resources to support student-driven learning. These resources take various forms, from simple tools such as calculators, notebooks, dictionaries, and checklists, to resource files and databases. The purpose of offering learners access to these tools is to provide opportunities for them to optimize their own cognitive growth.

Live GBSs provide learners with access to resources needed to gather information to help in performing tasks such as data analyses as they strive to accomplish the mission they are given. As explained earlier in this chapter, Live GBSs also use the experiences of team mentors and role players as resources for learners. Other examples of resources used to support student-driven learning in Live GBS courses include databases, video, and documents with domain-specific or scenario-related information.

Case-Based Reasoning as a Learning Perspective

CBR (Kolodner, 1993; Riesbeck & Schank, 1989; Schank & Abelson, 1977) explains how the process of solving new problems is related to the solutions of similar past problems. In theory,

this is how we use what we learn in daily life to solve new problems. When we make plans to pursue goals, we remember relevant *cases* in which we pursued similar goals in the past. Moreover, we remember mistakes in pursuing these past goals that help us avoid repeating history. In traditional instructional models, instructors teach content out of context *before* providing any opportunities for context-specific practice. However, people do not effectively learn abstract principles divorced from relevant usage contexts (Collins, 1996). We learn principles and procedures as a *result* of our experiences within specific contexts, and then, through repeated experiences in varied contexts, we eventually abstract the principles we learn and apply them in a more general way (Bransford & Vye, 1989). The influence of CBR in Live GBS design is seen in two aspects: memory and failure.

The Role of Memory in Case-Based Reasoning

CBR builds upon the theory of *dynamic memory* (Schank, 1982a, 1999). A simple explanation of dynamic-memory theory would be to say that as we experience life, we pursue goals that we find motivating and we perform tasks and activities in ways that we believe and expect will lead us toward successful achievement of these goals. When we find that our expectations are wrong about how to perform a task, for example, or we do not know how to proceed, we realize that we do not understand something about the task. Our *"mental models*" (Gentner & Stevens, 1983; Johnson-Laird, 1983) of the task are either incomplete or incorrect. We then look for *explanations* to help us understand the failure. When we find an explanation that makes sense, we modify our mental models accordingly. We look for an explanation of what goes wrong and appropriately modify our mental representation of the process. In future attempts, we can use our new knowledge to have more accurate expectations and success in achieving the goal. We

dynamically modify our memory structures as we experience life. Therefore, in order to learn we have to have experiences that bring our knowledge and expectations into question, and to seek explanations so we can modify our memory structures (Schank, 1982b, 1986; Schank & Abelson, 1977).

As learners in a Live GBS learn new skills and knowledge through performing tasks in the scenario, they will develop new cases to be indexed and recalled in future applications. In Live GBSs learners who already have some prior knowledge or scripts for how to perform the skills they practice can modify their memory with cases from the GBS to apply changes to the representation of tasks in future situations.

The Role of Failure in Case-Based Reasoning

CBR is practiced when expectation failures happen during the process of performing an activity or task. When we have a problematic experience, we remember the expectation failure that occurred and we remember the lesson we learned. We categorize into our mental library of memories the two parts of the experience together, as a package. This process is called "indexing" (Schank, 1982b). This is done so the next time we confront a similar endeavor, we retrieve the memory of the expectation failure and lesson learned, and we use the lesson to make more effective plans in the new case (Hammond, 1989). Reasoning from our past cases or from stories we hear of other people's experiences is CBR. (Kolodner & Jona, 1991; Riesbeck & Schank, 1989; Schank & Abelson, 1977).

This comes into play in Live GBSs as learners have expectations of what will happen but often make mistakes (simple, complex, subtle, and obvious ones). When they make mistakes, their

expectations of what they thought would happen fail. The learners will then adjust how they think a task should be done in light of the error made. When learners in a Live GBS are faced with problems to solve, they can apply prior experience and knowledge toward this goal.

In Live GBSs learners are given a mission to pursue. The mission is typically a problem that needs to be solved in the context of a scenario. As they work to achieve the mission they will find that they need information or need to perform tasks that will help them get the information they need to accomplish the mission. Sometimes learners are presented with new concepts and are unsure how to move forward toward their goal. This will cause them to realize that there is something about their representation of the task that is lacking. They also experience expectation failures when they find that their prior knowledge has failed them. This realization happens either because they are surprised that they failed or because they are surprised at how they failed. The moment people are surprised by an unexpected result of an action, they are ready to learn and modify their representation of the task domain in which they are working. Assuming they want to accomplish the goal they were working toward, they will be ready to modify the representation due to the expectation failure. When learners recognize the need for help, just-in-time explanations, instruction, or other feedback is given.

Conclusion

Overall, there are many areas where CBR and situated cognition together make more concrete suggestions about educational practice than does either one alone. When used together, the instructional implications of situated cognition and CBR can influence the design of learning environments such as Live GBSs. These learning environments apply an understanding of how learning occurs in everyday life to how learners interact with their environment. The problems

learners encounter and try to solve in Live GBSs become cases to be applied to future situations, as CBR suggests. They are also used as vehicles for learning, as situated cognition suggests. By appropriately embedding content in context, learners acquire knowledge as well as a sense of when and how to use it.

In order for instructional designers to create Live GBSs, the design process created by Live GBS design architects must be articulated. The design methodology has not previously been articulated, which in turn renders the process inefficient. Without a clear design process, Live GBSs cannot be duplicated outside the primary community of experienced design architects with implicit knowledge gained from building Live GBSs. The next chapter will discuss the steps of the design process in an effort to make this implicit knowledge explicit so that Live GBS can be constructed by a wider community. However, the articulation of the design process is not sufficient information to ensure a successful outcome. The research question this dissertation strives to answer is: How does one design Live GBSs so they will be successful? The process needs to be informed by design principles, introduced in chapter 5, which can be looked upon as conditions for success that can be applied to the steps of the design process.

CHAPTER 3:

THE LIVE GOAL-BASED SCENARIO DESIGN METHODOLOGY

The Live GBS design methodology is derived from simulations designed by researchers and graduate students from the Institute for the Learning Sciences (ILS). Observations of Live GBSs run by clients who used Live GBSs as the crux of their training courses, including Andersen Consulting's Front End School and Millennium Consulting Partners, supported the codification of the design methodology. Although the Live GBS design was implemented for these and other companies, the methodology has never been formally codified until now. In this chapter, the steps appear in a procedural order, explicated in a more general sense, and anchored in methodology with descriptions of how they were applied to actual Live GBS designs and implementations.

The Live GBS design process consists of seven primary steps (Figure 1). The first step is to form a cross-functional design team. Then, the team must identify the skills and domain knowledge that comprise the learning goals of the course. The third step is to find a typical, representative case that requires some of these learning goals to serve as the prototypical case. In addition, a fictional scenario is developed that provides the context of the activities in which the learners will be participating. In the fourth step, designers distill a narrative of events from the documentation of the prototype. The fifth step in the process is to analyze the prototype to ensure the learning goals are embedded within it. In the sixth step, the designer develops positions, issues, and scripts for role players and areas of focus for coaches and mentors. Then in the seventh and final step the structure of the course can begin to take shape in the design of culminating activities focused on specific skill sets and reflection periods in the course

framework (Figure 2). This, the seventh step in the methodology, also includes building an infrastructure of operational and technical support that serves the pedagogical objectives and enriches the scenario to create a more authentic environment.

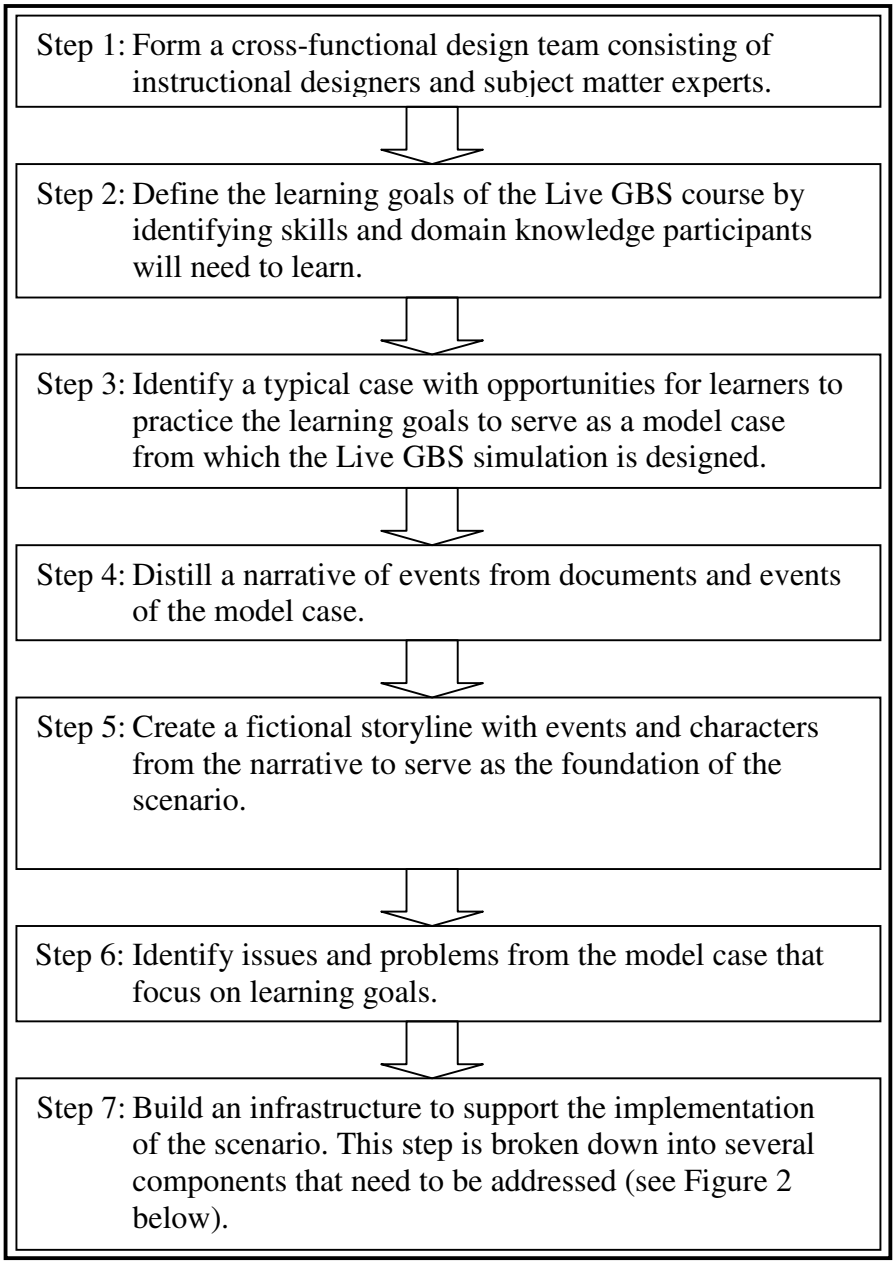

Figure 1: Expert Design Methodology for Live Goal-Based Scenarios

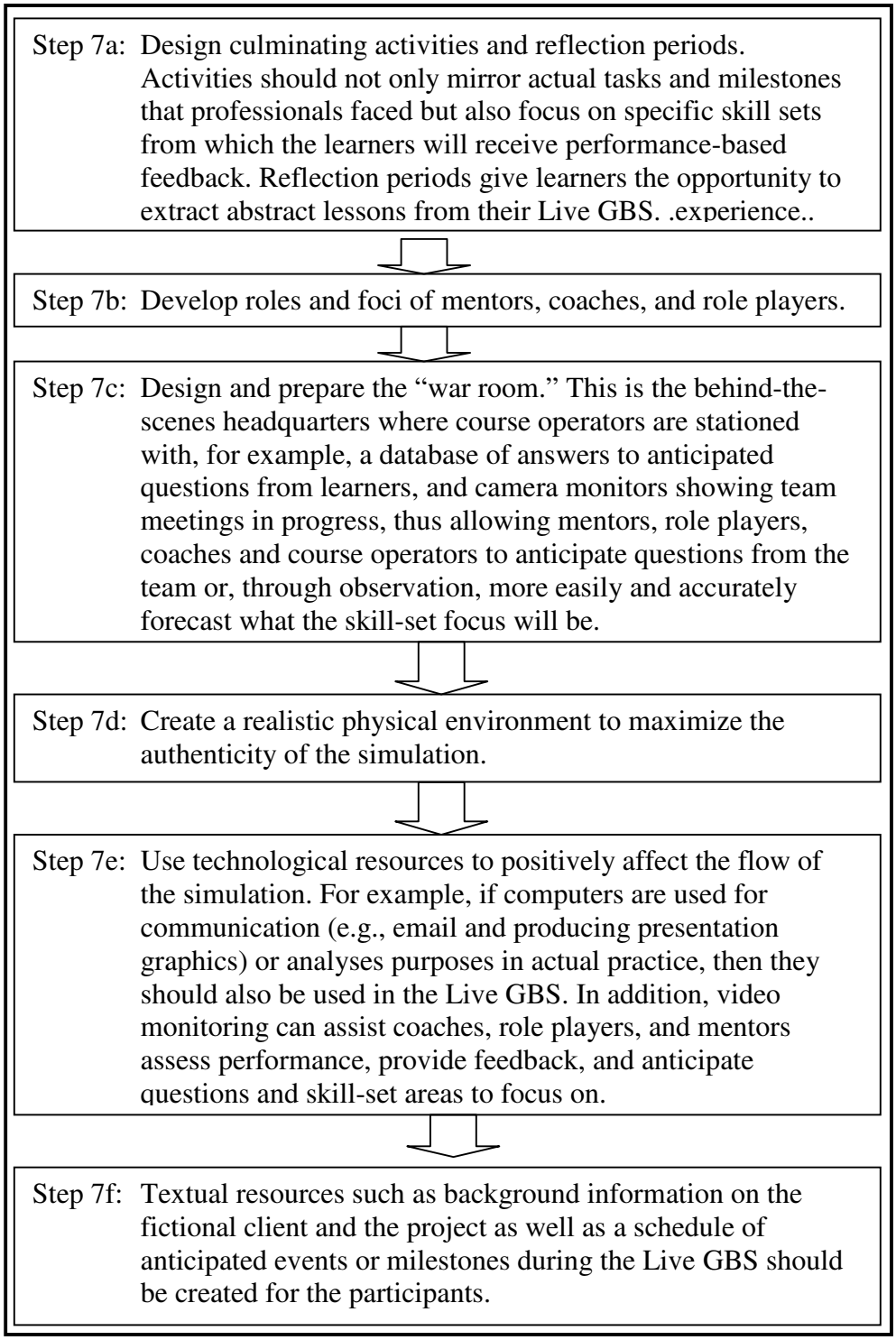

Figure 2: Expert Design Process for Live Goal-based Scenario Substeps 7a-f

Step 1: Form a Cross-Functional Design Team Consisting of Instructional Designers and Subject Matter Experts

Having a cross-functional design team means having a team of instructional designers working side by side with subject-matter experts. This teamwork is important to the design process because the real-life cases that are used as prototypes often do not contain the amount of documentation or data needed to build a data-rich environment. As a result, much of the necessary data, material, and realistic background information have to be created or recreated by the design team. Subject-matter experts who are acquainted with the industry, the client company, the domain knowledge, and the target skills can advise the instructional designers on factors such as how to create realistic data for the case, what issues are important, and how to ensure an authentic environment; saving the instructional designers considerable amounts of time and effort. The subject-matter experts can either be client personnel or experts recommended by the client. If the experts are from the client company, ideally they will be in more senior positions than those of the target audience. It is important that the experts working with the design team are in touch with the experiences that the learners will encounter in the real world and are familiar with misconceptions and typical mistakes novices make. Having client personnel on the design team is preferable because they have access to other people and resources within the company. Although it would be ideal to have the subject-matter expert working full-time on the team, it is not realistic because the client company usually cannot or will not sacrifice the time and money needed to provide those people. But it is important to have at least one person dedicated to the project for an appropriate amount of time, agreed upon by the client contacts—typically business training executives, the subject matter experts, and the design team. This first step in the design process, getting the experts on the design team in some

capacity, is agreed upon by the instructional design team and the client before the final contracts are signed and the design process goes forward.

Step 2: Define the Learning Goals of the Live GBS Course by Identifying Skills and Domain Knowledge Participants Will Need to Learn

In the beginning stages of the Live GBS design, designers need to have a basic theory of what typical tasks the learners will perform in the real world and what type of information they will need to know in order to do these tasks.

Over the course of several Live GBS designs five categories were identified into which typical learning goals fall:

> qualitative/quantitative analysis skills—conducting qualitative/quantitative analyses, and computing and integrating domain-specific figures as a means of diagnosing and solving problems;
>
> communication skills—written or oral communication skills such as interviewing or team building;
>
> domain knowledge—objective information about the field in which trainees will be working;
>
> philosophy—cultural attitudes in the industry and in the individual company; and
>
> technical skills—skills involved in performing tasks in the problem-solving process such as data gathering and using available technical resources (these may also overlap with qualitative and quantitative skills).

These areas help elicit further specific tasks and goals from the client. Specific tasks certainly are incorporated into the course, but it is more efficient to shape the course design by beginning with a focus on general skills that the learners will use regularly in the field.

Most information about the skills required for successful performance in the field can be gleaned from interviews with subject-matter experts working with the design team, interviews with other client personnel, through a minute analysis of a successful case another person or team in the client company experienced in the past, or literature explaining basic concepts of the industry.

Step 3: Identify a Typical Case with Opportunities for Learners to Practice the Learning Goals to Serve as a Model Case from which the Live GBS Simulation Is Designed

The more the participants in the Live GBS course care about solving a problem, the more attention they will pay to learning how to solve the problem. With this in mind, the authenticity of the environment must be addressed from the beginning and maintained throughout the design of the course in order to achieve an appropriate level of suspension of belief in the Live GBS. To achieve this, the course must be based upon a real case that experts from the client completed. Ideally, the client would have several cases from which to choose a prototype. Typically, there may be only a couple of viable cases to look at. Sometimes designers have only one example case to use as a prototypical case. Regardless of how many cases the design team has to choose from, the case has to coincide with three criteria that constrain the search for an appropriate prototype: typicality, complexity, and data mass.

In most domains, generalizations can be made about every case. In other words, certain tasks or occurrences can be anticipated to arise in nearly every case in a specific domain. Generally, it will be the designer's intent for the learners to expect and be proficient in working with these common elements. When choosing a case, these common elements are identified.

It is also true, however, that every case has its idiosyncrasies. Encountering unusual, intricate problems that occur within a domain is what develops expertise. Experts recognize a wider variety of issues than those that constitute a classic case. By having students work within an authentic case they will have the opportunity to encounter complex problems containing elements that add depth and a manageable level of complexity to the scenario.

The case also needs to include a great deal of documentation and raw data to be used to support the learning goals within the course. This pool of data serves two purposes: to provide analysis material for learners, and to embellish the simulation with realistic detail, even in areas learners are not expected to explore completely.

Step 4: Distill a Narrative of Events from Documents and Events of the Model Case

Once an appropriate prototype is found, the designers distill a narrative from the prototype case that can act as a framework for the simulation. Simply stated, the narrative is the storyline of the prototype case with a critical path of the problem-solving process including tasks, activities, and milestones the original personnel experienced in the case. Issues or problems the original personnel encountered and had to solve in order to achieve their goal become evident as the design team interviews personnel and reviews documents from the case.

The objective of case analysis is to take the existing data from the case and form a progressive narrative—an understanding of what happened on the first day, what happened on the last day, and a causal story that leads from one to the other. This creates a sort of critical path to be followed and used as the basis for the problem-solving process. Constructing the basic narrative

helps designers understand the domain from a skills standpoint in order to elaborate learning objectives as well as understand the events of the case.

Step 5: Create a Fictional Storyline with Events and Characters from the Narrative to Serve as the Foundation of the Scenario

The scenario is the story the learners experience in the Live GBS. The scenario is derived from the narrative and is centered on the original case's actions and skills, with details and the original conclusion or solution scrubbed from the case to make it unidentifiable to participants. From this, major milestones in the case, such as the original mission, are highlighted and built into the framework of the scenario.

Step 6: Identify Issues From the Model Case that Can Be Mapped to Learning Goals

The next step in the design process is to derive from the prototypical case and knowledge about the domain, a list of problems or issues that include those that professionals commonly face, and those they faced in the field during the prototype case. The goal here is to create a list of problems typical within the industry yet with complex issues and enough supporting data that will allow the trainees to use skills they need to learn. This is achieved through studying data from the prototype case, understanding the events from the narrative and interviews with professionals who are already in the positions for which the learners are training, as they are most familiar with the tasks and resources that the job requires. By understanding the relationships between the events of the narrative and the issues that arose, designers can form the basic structure of the course.

Typically, an extensive list of issues exceeds a reasonable number for course participants to encounter within the time constraints of the course. To ensure learners benefit from being exposed to issues most important to their job, designers have to prioritize the issues that are to be embedded in the course. Expert guidance from the client is extremely valuable in limiting and prioritizing the list of issues based on relative value of embedded learning goals, authenticity, and interest.

Step 7: Build an Infrastructure to Support the Implementation of the Scenario

Once learning goals, issues, and the general scenario are identified, a course structure needs to be built to organize a credible simulation of the prototype case to present a time- and data condensed version of reality in which learners face authentic problems in a realistic context that allows them to receive guidance from mentors, coaches, and role players. This construct provokes the learners to confront the issues that facilitate authentic practice of the most important skills of their trade.

Although it is highly authentic, Live GBS cases have significant differences from real-life business cases. Under actual circumstances learners will be responsible for only those tasks that they can perform best, whereas Live GBS courses place emphasis on the learners' skill improvement. The course infrastructure provides a safe arena for consultants to practice domain-specific problem solving. They are protected from damaging the fictional client, their employer, or their own careers, and they have unusual access to mentors and coaches who can scaffold their work.

There are six main components to this infrastructure: culminating activities, focusing on specific skill sets from which participants would receive performance feedback; role players, mentors and coaches; course operators; space resources; technological resources; and textual resources such as preliminary material and a schedule of events.

Step 7a: Design Culminating Activities and Reflection Periods

Each set of skills that learners practice culminates in a performance supervised by experts in the field or in specific skills. Each activity or task builds upon information learned or skills developed in previous tasks. A number of activities facilitate feedback to course participants. The design of a Live GBS is typically used to teach two categories of skills. The first is the "problem-solving process," which refers to domain-related knowledge and process skills learners perform in service of the overarching problem-solving goal such as data gathering, analyses, and hypothesis-derivation skills. These are skills and knowledge that are shared from mentor to student, or senior professional to junior professional. The second skill type is "human interaction." This entails interactions involving communication, interteam dynamics, and team/client issues such as interviews, team interaction, and presentations, with monitoring and feedback provided by hired coaches. The result of this is productive, context-relevant feedback given to the learners.

Building reflection periods into the course is equally as important as designing activities in which the learners have to practice skills and understand concepts within the domain. "Metacognitively aware instruction" encourages self-reflection on the part of the student (Bruer, 1994). The purpose of this method of instruction is to facilitate learners‘ development in becoming critical of their own problem-solving techniques. At the very least, it gives learners the

opportunity to make some sense of the wealth of information they receive and to let the experiences of the day sink in.

Reflection periods can be either formally or informally structured. More formal approaches using experienced coaches such as corporate psychologists and corporate communications trainers provides expertise to scaffold this process. These coaches use videos of the trainees' own work as an analysis tool in one-on-one feedback sessions with the trainees. This process allows learners to view themselves in a more objective manner, and to practice reflecting critically about their own skills. Informal debriefing sessions in which the learners discuss their experiences in the course and related field experiences is also an effective approach to getting the course participants to reflect on their experiences. Team reflection sessions can last anywhere from 30 minutes to an hour.

Step 7b: Develop the Roles and Foci of Role Players, Mentors, and Coaches

Role Players

Through interviews and by analyzing the prototype case, professionals gain much of their information about their clients, their projects, and the industry through human interaction. In the field, the learners will often gather data by conducting interviews and asking people questions as needed. Therefore, designers should provide them with authentic role players, usually in the role of simulated clients, to answer their questions. Receiving data through human interaction can be structured in and around the problems that learners will face during the course.

This is an expensive proposition. Unlike computer-based simulations in which there is a single production cost, Live GBSs will incur substantial human resource-related production costs to

run. As effective as the human resource factor is, the designer and client need to keep in mind that this cost will recur each time the course is run. To address this, one may decide to limit the role players to a few professionals, well versed in business, the industry, or the role that they are portraying. As for other role players, the designers and some members of the client firm can role play nonessential positions in person or through email and telephone correspondence. To ensure that the live role-player's answers to participants' questions would be realistic in terms of the simulation and would be useful in terms of pointing them toward the learning objectives and problems identified in the prototype case analysis, designers develop scripts that correspond to each issue that is included in the course.

Issues are basically situations or problem areas in the scenario that the learners encounter and must solve. Issue scripts are forms designers use to determine how issues are encountered in the scenario and how learners can solve these problems. Issue scripts are typically comprised of six sections: description, entrance paths, analysis paths, recommendations, open questions, and areas for potential analysis. The description section is a brief overview of the issue itself. The purpose of the entrance paths is to establish as many ways as the data would support to allow trainees to stumble upon situations in which they would need to use target skills and knowledge to problem solve their way through.

Each entrance path is described in terms of a question that a trainee could be expected to ask, a person to whom the question might be directed, and a realistic monologue that a specified employee (or other role player) could say in response to that question. In some cases, because of the highly compressed nature of the simulation, information that would make the issue more obvious than it was in the original engagement is created. Analysis paths consist of designers'

and experts' conjectures of how trainees would continue exploring an issue. Recommendations are potential solutions that have data to support them. "Open questions" and "potential analysis" are notes to designers regarding outstanding work to be completed for subsequent iterations of the course.

Mentors

In some designs of Live GBSs the course participants work in teams. This reflects the actual structures of the environments in which the course participants work because all aspects of the setting needed to reflect an authentic environment. Because in actuality client companies work in teams, usually headed by an experienced professional, the team structures in the Live GBSs reflect that hierarchy. The experienced professionals in Live GBS teams act as mentors who help their junior counterparts understand the company, the industry, and specific tasks and concepts within the scenario. In these cases the mentors of each team are made privy to the learning goals of the course and are given a few major goals to balance. One is to behave as participants would in the course of an actual engagement, so learners experience a work environment as close to the real world as possible. The second goal is to encourage junior team members to work on skills and concepts outside their areas of expertise (Vygotsky, 1978). In addition they are expected to serve as role models for the junior team members to observe. Finally, in some courses the mentors also double as agents for the design team, advising them on areas of focus. That is to say that during the run of the course, senior team members/team mentors, unbeknownst to the rest of the team, are working behind the scenes with the designers, role players, and coaches by providing insights on how well they feel their teams are performing tasks and in what areas or in what ways the teams could further interact with role players or receive guidance from coaches in

order to successfully work through the scenario. This can make the course more dynamic by adding richness and adaptability to the course.

Coaches

In Live GBSs, the term "coach" is used to describe an expert in a process or interaction skill who is not in a scenario role either as a team member or a fictional role player. Coaches can either be experienced professionals in the industry or hired experts who observe individual and team performances and provide feedback after the performances. After learning goals and issues are solidified, coaches are identified and brought into the design process to provide input on activity structure, and to help designers define their roles during the course.

In past Live GBSs designers invited senior professionals from within the client company, experienced corporate psychologists and experienced corporate communications trainers, to participate in the courses as coaches. Senior professionals often act as coaches for skills involved in the problem-solving process. Corporate psychologists can act as team dynamics coaches, focusing on issues surrounding team relations. The corporate communications trainers use oral and written communications to coach the teams.

Coaches provide both feedback and practice in metacognitive self-assessment to the trainees, and gather material through video monitoring and informal status meetings. The coaches can meet with team members regularly one-on-one or in small groups to provide feedback. Informal presentations as well as observations made while monitoring team sessions provide material for feedback from coaches as well as team and individual reflection. Learners and facilitators use reflection sessions to address unresolved issues from tasks performed and situations encountered

during the day. For these purposes the duration of reflection sessions is from 30 minutes to 1 hour. Other types of skills are assessed and verbally evaluated during more formal presentations.

Step 7c: Design and Prepare the Behind-the-Scenes Strategy Area

In a strategy session, trained staff act as course operators to run the course from backstage. The Live GBS design team usually comprises the course operators because they are best acquainted with the course design and goals. Of course, this also implies that client personnel who worked with the design team are equally qualified to run the Live GBS. Course operators have the responsibility of guiding the role-play characters through questions they may have during the course, acting "in role" as teams' executive assistants by managing meeting times for interviews and presentations, and monitoring the implementation.

In addition, they assist participants to gather necessary data during the course. Participants may not have all of the data necessary to solve the problem at hand. Therefore, in gathering information, participants will request data or interview scheduling (using either paper-, phone-, or email-based methods) from scenario characters that are likely to carry out the request in the real world. Course operators fulfill the requests as they play the roles of fictional clients such as executive assistants and customer service representatives.

Course operators track developments by observing teams in action through video and/or audio monitoring or in-person observation. The monitoring process helps the designers change the direction of the course when necessary. Having experienced professionals as field experts is essential to this task. They are able to analyze the progress of the course, provide challenges when learners are ready, and scaffold those in need of additional assistance. Furthermore,

monitoring allows designers to supervise hired experts and direct them according to the needs of the course.

Step 7d: Create a Realistic Physical Environment to Maximize the Authenticity of the Simulation

The physical space in which the simulation takes place contributes greatly to the authentic atmosphere. Ideally, the course is conducted in an environment in which tasks and other events are likely to occur in the real world. If, for example, tasks and presentations usually happen in an office setting where teams work together in a room, role-play characters have their own offices and presentations are made in boardrooms. The physical space in which the Live GBS takes place reflects the actual setting as fully as possible.

Course staff, such as the course designers and personnel from the client who help operate the implementation, have a separate strategy session, keeping the operators and other backstage hints from the eyes of the participants. Coaches may conduct meetings with individual trainees; therefore they have small offices apart from the team rooms, yet easily accessible to participants.

Step 7e: Use Technological Resources to Aid the Flow of the Simulation

Using technological resources such as personal computers and video equipment during the implementation of the Live GBS can greatly affect the flow of the course. If each learner or team has immediate access to a networked computer equipped with email, a word processor, a spreadsheet/graphing program, and presentation software, they can email questions and data requests to scenario clients, easily prepare memoranda and other forms of written communication, conduct quantitative analyses, and create professional presentations to scenario clients and senior executives of the client firm.

In addition, video can also be used quite extensively. Video cameras in team rooms can be linked to monitors in the course operation room for a variety of purposes:

1. To allow coaches to assess and respond to participants' performance.

By watching the monitors, coaches are able to prepare appropriate commentary to be given immediately after the presentation.

2. To allow course operators to assess and respond to participants' performance; making the course dynamically modifiable.

That is to say that course operators can choose to alter the foci of the training during the implementation. For example, course operators are able to observe a participant's needs and incorporate extra practice into a course, simply by having a scenario client request certain types of information.

3. To allow course operators to anticipate learners' questions.

In order to give the course an authentic feel, the simulation needs to be extremely rich. Participants ask questions in any area, and they expect realistic responses from scenario clients. Monitoring conversations greatly increases the course operators' ability to provide realistic responses in a reasonable time. By the time the participants send in their questions or requests, course operators often have the answers, data, and/or documents prepared.

4. To increase performance pressure for participants.

At least initially, the learners will be aware of being monitored on video. The cameras will make them aware of the course, conscious of their actions, and therefore encouraged to take the course more seriously.

5. To allow course designers to assess affective responses to the course.

For designers, the ability to see every presentation and its aftermath is invaluable. One can know during and immediately following each event what the learners thought of it.

6. As a tool for reflection.

Playing back video of a team or individual can be an effective tool for reflection as it provides a unique perspective from which learners can view their actions. As learners watch themselves on tape, the experience, by its nature, can be interactive. Although it may be easy to passively observe the action of others, seeing their own professional practice from a new angle may naturally create reactions, opinions, and reflection.

Step 7f: Create the Textual Resources Such as Background Information on the Fictional Client and the Project

Because of the limited time period of the implementation, it is more efficient to provide the course participants with some course and Live GBS scenario-specific background information ahead of time. By providing the learners with as much relevant background information as possible, valuable time will not be wasted by them trying to rise to a level of competency at the start of the course. An example of a preliminary material packet can include a schedule of events, a general overview of their firm's approach to reengineering, a guide to available resources, or even an role-play document such as a proposal written by the preceding team, the CEO, or the fictional client. The preliminary material benefits participants by setting the scenario, setting expectations for the course, and giving participants the opportunity to familiarize themselves with events and resources ahead of time.

A schedule of scenario events and milestones can be designed in the initial stages of the design. One can derive a schedule of events by simplifying and condensing the typical course of events in a business case such as the prototype case. A typical schedule includes events such as client meetings to discuss the work proposal, full-team meetings devoted to laying out the work plan and assigning roles, client interviews, small, midpoint presentations, and a final presentation.

By prescribing times for these events, designers set clear expectations regarding time management. Because the course revolves around these predetermined events, a completed schedule is supplied to the course participants before they arrive.

Limitations of Live GBSs

Even after several implementations of Live GBSs, the same areas of limitations seem to arise, prompting designers to ask themselves: "It's better than conventional teaching methods, but is it better enough?" (Bareiss, personal communication, January 2006). The common areas of limitations are: the complexity of Live GBSs design and delivery; the cost of building and implementing the simulations; striking a balance between instruction and economy; time to organize team dynamics; and time allotted to assessment of individuals.

The Cost to Build and Implement the Simulations

Associated with design steps #7a and 7b: Live GBSs are very complex to manage and deliver because creating a simulation with authentic role players is expensive and limiting, especially when there are large numbers of learners to accommodate.

Associated with design steps #7b, 7c, 7d, 7e, and 7f: Finding and training a support team to monitor operations of the Live GBS implementation (e.g., managing data and resource requests, scheduling interviews, and generally keeping the simulation running smoothly) and professionals with experience in the roles they are asked to role play can be costly. When they are available they can command large sums of money for each Live GBS implementation. A Live GBS is possibly the most expensive form of role-play training, and designers usually struggle with balancing their cost and benefits (Bareiss, personal communication, January 2006).

Associated with design step 7c: There is a coordination and synchronization problem with finding role players for Live GBSs. Role players with real-life experience in a particular domain are not only costly, but they may also be available only on a limited basis or have constraints that make coordinating the implementation of a course with key role-players a challenge.

Associated with design step 7: Curriculum development can be economically constrained. For every Live GBS there is a significant lump-sum expenditure for the initial design as well as additional expenses associated with refreshing and fine tuning the curriculum over several implementations.

Striking a Balance Between Instruction and Student-Directed Learning

Associated with design steps #7a and 7c: Coaching is very important in a Live GBS. However, there is a question of how much is a reasonable amount of coaching to give learners. Finding an appropriate amount of coaching means providing enough guidance without hindering student-directed learning (Hmelo-Silver, 2004).

Associated with design steps #1, 5, 7a, and 7c: Coaching may be economically constrained given that designers are working within a fixed budget. This raises the dilemma of how much instruction can be economically delivered. An effective Live GBS uses Socratic coaching (Edelson, 1996) and subject matter experts to help with instructional design or to participate in the implementation as role-players or team mentors. And role players have experience and, more importantly, feedback to bring to their character. Therefore, with economic constraints affecting one or more of these areas of instructional support, there is the constant question of what level of instruction designers can produce.

Team Dynamics

Associated with design step 7f: As teams work through the scenario performing tasks that get them closer to their goals, a variety of problems can arise involving language differences, subject matter, and collaborating in teams. Learners for whom English is their second language can feel frustration performing some of the tasks in Live GBSs such as producing professional documents they have never been asked to deliver before, and delivering them in an environment in which the time normally afforded them to create these is condensed. Teams have also experienced internal pressure when there is a gap of understanding between teammates unfamiliar with the subject matter and those with more experience in the domain. Sometimes more experienced learners will mentor the less experienced. Other times, because of time constraints, the more experienced will take over a task leaving the less-experienced team members with an incomplete picture of how to perform the task.

Associated with design step 2: Because the work done by learners in Live GBSs are team based, implementing the Live GBS course comes with all of the problems one associates with helping

individual learners meld into high-performing teams. Learners may be paying customers who feel anxious about participating in a course that does not act or feel like a customary instructional method. It can be very difficult to change to a Live GBS when some or most of the learners and/or staff hail from didactic teaching methods. Instructors and learners with a particular concept of teaching tend to have an easier time adopting a similar approach to teaching (Trigger & Prosser, 1996). This causes some stress with coaches and learners alike, and at times has caused the Live GBS to lose learners. The impact is strong within affected teams when success in the course is dependent upon team-based work.

Assessment of Learners

Associated with design step 1: Learners are also anxious about having their grades depend on the performance of others. However, because of logistical constraints in working with teams, designing activities for individual development can be highly problematic to support (Bareiss, personal communication, January 2006).

Associated with design step 7a: The issues of how to adequately assess learners on an individual basis, as well as how to assess the success of a Live GBS as an instructional method, need to be resolved. In order to assess the effectiveness of any Live GBS, one needs to know how well knowledge gained through the course transfers into real-world practice over time. In assessing learners, the success of a team's deliverables during the scenario can be the basis for providing certificates of completion of a Live GBS course (Bareiss, personal communication, January 2006). Coach and peer evaluations can also be used as guidelines for individual assessment. Observations from coaches and team mentors are used to fine tune target learning goals for teams and individuals and have, to an extent, been used to evaluate individuals. Learners,

however, have only been asked to evaluate the Live GBS upon completing the simulation, but have not been asked to assess their peers.

Researchers at the ILS used this methodology to design Live GBSs for professional training purposes. To better illustrate the steps of the design methodology presented in this chapter, the following chapter will discuss the methodology as it was manifested in three cases of Live GBS designs.

CHAPTER 4:

THREE CASES OF LIVE GBS DESIGNS AND IMPLEMENTATIONS

In the preceding three chapters, I introduced the Live GBS, the ideal Live GBS design template, cognitive and social theories supporting the Live GBS, the main components of a Live GBS, and discussed the seven primary steps of the design methodology. The methodology for designing Live GBSs and the design principles resulted from lessons learned during the development and implementations of these courses: from data gathered from personal experience on Live GBS design teams; interviews with design experts, clients used as content/process experts, team mentors, and coaches from the PB2 and GHA courses. Additional research was gathered from field notes from the implementation of the three courses discussed in this chapter as well as from other Live GBSs developed by former clients.

Data and Methods Used in This Research

The Authors, Development Contexts, and Clients of the Designs Studied

Two of the relatively few communities designing Live GBSs during the time of this research were The ILS at Northwestern University and Roger Schank and Associates (RSA), a corporate spin-off of ILS. Because ILS and RSA were departments comprised of proven GBS design architects, they were ideal to interview about the process of constructing Live GBSs. The experts interviewed at ILS were faculty and staff members involved in developing Live GBSs.

At ILS, the common way that Live GBS designs were produced was in the context of project work outside of courses. Another body of design work was studied and produced through RSA. RSA's projects were all produced for paying clients who approached the firm with specific training needs for their organizations. Almost all of these clients were corporate. Their projects were designed largely by faculty from ILS and graduate students from the ILS Ph.D. program, although other senior staff members sometimes provided significant input into the designs.

Whereas design architects generated the overall design for the Live GBS, developers on the Live GBS design team contributed to the conceptual design of the course and created materials to support the target learning goals in the scenario. Areas of conceptual design included:

Determining target skills,

Determining domain content,

Selecting viable scenarios to frame target learning goals,

Mapping teaching points to the scenario, and

Building a scenario schedule that allowed for a natural breakdown of activities to be performed during the course and allowed time and opportunities for learners to create expected deliverables.

Creating supporting material included finding appropriate activities in example cases that not only met target learning goals but also had enough supporting data with which learners could perform the tasks.

How Data Were Collected

Interviews and Informal Conversations with Live GBS Design Architects

Live GBS design architects at ILS and RSA, Ray Bareiss, Larry Birnbaum, Chip Cleary, and Gregg Collins, often had stories of their own experiences during various stages of Live GBS design as well as anecdotes of other designers in the ILS. Many of the stories collected in interviews contained useful discussions of the successes and failures that occurred while constructing and implementing the courses, strategies for preventing future errors during the design process, as well as discussions of why some errors might be bad for learning and/or motivation.

Some substantial portion of the data gathered in this dissertation were also gathered more informally, during conversations in the hallways of ILS. Senior and junior graduate students often exchanged stories of their design experiences. Graduate students at ILS collectively put together documentation of the design of PB1 gathered from personal experiences with designing Live GBSs.

Interviews with Content and Process Experts

A critical component of designing Live GBSs is working with people from the client firm who have a fairly good grasp of the content in the domain. In each of the three Live GBSs described in this chapter, graduate students and seasoned professionals, who understood how to perform the tasks and activities required to solve the mission or problem, worked with learners. Experienced professionals knew what type of information and deliverables learners would need

in order to achieve the scenario mission and to perform the supporting tasks and activities. They also knew how to mentor learners through the process.

Interviews with Role Players, Team Mentors, and Coaches

Interviews were conducted with five role players from the PB1 and PB2 courses, two team mentors from the PB2 course, the communication skills coach from PB1 and the quantitative analysis coach from the GHA COS course.

The role players were asked open-ended questions about strategies they used to incorporate their background experiences into the role they played, how their professional background matched the role they played, how their own experiences in their respective professions influenced their interactions with the learners, anticipated and unanticipated learning opportunities that occurred during the courses, and challenges they encountered in their experiences interacting with individuals and with teams of learners during the courses.

The team mentors from the PB2 course answered open-ended questions about their roles as mentors, such as how they characterized their role, any training or guidance they were given for their roles as mentors, what tasks they modeled for their teams, how they used operations staff during the course, what their teams did during each of the days of the week-long course, what they did when they were not in the rooms with their teams, strategies they used to guide their teams through the problem-solving process and reflection sessions, as well as general challenges they encountered in their roles as facilitators.

The coaches were asked open-ended questions about their experiences during the Live GBSs. These topics included the quality of preparatory information given to them prior to the courses,

and what strategies and methods they used to provide feedback to learners individually and in teams.

Reviewing Video Footage and Other Documents

Forty hours of video from the PB1 course at Millennium provided an overview of some key activities that the designers and developers were not permitted to observe in person during the run of the course. The videos were originally viewed by the communications coach as a means of following the actions of teams and individual learners through a variety of activities in their daily schedules. These included team meetings with team mentors (to observe team dynamics and communication skills), and team meetings with key role players in the scenario (to observe interviewing and presentation skills).

Reviewing Other Live GBSs

Other Live GBSs produced outside ILS and RSA were developed in a corporate training facility run by a former clients of the ILS and RSA. Field notes from the implementation of these courses and interviews with their design architects suggest the process of creating these Live GBSs does not appear to significantly differ from the process used by Live GBS designers at ILS and RSA.

Surveys of Participants

Two participant surveys were disseminated after the PB1 and GHA Live GBS courses. The purpose of these surveys was to gauge audience response in order to gain some understanding of how participants felt about the implementation of the course. The negative responses from the

surveys indicated areas in which the Live GBS design failed; thus influencing the creation of future design principles. The survey results are described in Chapter 6.

Three Live GBS Courses: Practice Basics 1, Practice Basics 2, and the Government Health Association Chief of Staff Course

The remainder of this chapter focuses on three Live GBS courses designed by the faculty and graduate students at the ILS. The first Live GBS course, PB1, was designed from March through July 1994 for Millennium Consulting Partners, a consulting firm. The second is PB2, for Millennium, designed from May through July 1995. The third is the GHA COS course designed from June through September 1996 by the ILS.

The course designs will be compared to the components of the ideal Live GBS design methodology: forming a cross-functional design team; identifying learning goals; finding a prototypical case; distilling a narrative of the prototype and creating a scenario; identifying issues that focus on learning goals; and building a supporting infrastructure with culminating activities, reflection periods, role players, mentors, coaches, course operators, an authentic physical environment, technological resources, and preparatory materials.

Although subsequent designs showed obvious deviations from the ideal process flow (Figures 1 and 2), the Live GBS design that best exemplifies the design process is PB1 for Millennium Consulting.

Live GBS #1: Practice Basics 1 Course

Millennium Consulting Partners, a midsized management consulting firm, requested a training course focusing on business reengineering for consultants at every level: associates, averaging 0 to 3 years of business consulting experience; senior associates, averaging 3 to 5 years; principals, averaging 5 to 9 years; senior principals, averaging 9 to 11 years; and partners, the highest level, averaging over 12 years of experience. The firm itself was little more that a year old and the majority of the consultants were not experienced in the firm's specialty areas of consulting. One of these areas was business-process reengineering (BPR). BPR is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed (Hammer & Champy, 1993). As an example, BPR is used when manufacturing companies spend more money on administrative costs and have longer order-processing cycles than their leading competitors. They hire consultants to remedy these problems by finding the core causes of the problems and redesigning process flows in areas like credit processing, order taking, and product assembly.

Although many of the more senior consultants at Millennium Consulting Partners had experience in BPR, they were in the minority. The junior consultants in the firm did not have experience or training in BPR and the firm itself had been involved in only one reengineering project by the time they requested a Live GBS. Therefore, most of the knowledge of reengineering lay with the senior consultants who together had decades of experience in BPR but no vehicle through which to teach the information to junior consultants.

Step 1: Form a Cross-Functional Design Team Consisting of Instructional Designers and Subject-Matter Experts

Two people from Millennium Consulting were not experienced consultants, but were integral members of the design team, allowing contact with senior executives in the firm, data gathering, and data analysis to run smoothly. Toward the end of the data-gathering stage of the design and into the data analysis an experienced consultant was brought onto the team to analyze the data and develop issue scripts. This consultant's expertise assured the authenticity of the data and issue scripts.

Step 2: Define the Learning Goals of the Live GBS Course by Identifying Skills and Domain Knowledge Participants Will Need to Learn

Before designing the first course for Millennium Consulting, the learning goals for both new and experienced consultants had to be determined. When Millennium was asked what they wanted their consultants to learn, they responded by mentioning very specific tasks like how to do a regression analysis. This specific task was incorporated into specific tasks in the course, but initially the course design focused on general skills that consultants used on a regular basis. In order to identify these skills, consultants within the firm, subject matter experts, built a theory of what tasks are generally involved in a typical business consulting engagement, and what tasks are related to the BPR domain. A list of tasks was constructed, composed of the following steps:

- Gathering public information on Millennium's client (e.g., annual reports);
- Conducting preliminary interviews and focus groups in order to address specific information within the organization. These interviews help in diagnosing the causes of processing and other problems in a company;
- Developing process flow maps of organizational functions: order processing cycle, product assembly, credit, and collection hold processes;

- Other data gathering techniques like work-samplings, in which consultants shadow employees as they perform their jobs;
- Performing statistical analyses (e.g., regression analysis, determining inventory turnover rate); and
- Presentation techniques: graphic software, public speaking, presentation format (i.e., how to present information to get the point across simply and succinctly and to get the best response from your audience).

Some of these learning objectives were more domain-specific and restricted to a particular course although others were relevant to the general practice of business consulting.

Target Learning Goal: Quantitative/Qualitative Analysis Skills

Because members of the consultant team are able to evaluate costs and benefits of any recommendation they propose, knowing how to conduct quantitative analyses was critical, as this information needed to be delivered to the customer's senior management. Millennium Consulting asked that teaching regression and variation analyses be incorporated into the course, in addition to teaching how to configure domain-specific figures such as inventory turnover rate.

During an actual engagement of a Live GBS, assessment of consultants typically depends on the analytical thinking skills they have developed. In the design of the Millennium course, learners developed and used these skills through practice and feedback. For example, business consultants need to be able to take information supplied from interviews, surveys, competitive analyses and other forms of research to support an insight about changing an existing process or strategy. In order to perform this task successfully, it is necessary to have expertise in analytical thinking skills, such as the ability to identify problems as well as the ability to propose and

evaluate different ways to solve them; the ability to draw reasonable conclusions found in various sources; and the ability to defend one's conclusions rationally.

Target Learning Goal: Communication Skills

The role of the interview in a business reengineering engagement is critical in data gathering. Consultants in the firm often had to conduct at least one round of interviews within an engagement. First, they determined those areas that affect efficacy within the organization, and second, once the problem area or areas had been identified, they pinpointed specific issues concerning these areas.

In the Live GBS scenario, consultants drew out the necessary information from the client. Consultants first asked general, open-ended questions. These questions created an entrance path from which the interviewer could determine which part of the interviewee's organization needed further investigation. The interviewer then asked more specific, analytical questions to narrow the scope of the company evaluation. For example, a question like "How would you describe the communications within the organization?" can result in a lead pointing to bottlenecks or areas in processes in which the flow is slowed because of inefficiencies within the organization.

Throughout the Live GBS course, as in actual engagements, learners on the consultant team composed written summaries and other documents to present to members of senior management. The Live GBS gave the learners an opportunity to practice concise, clear communication. Learners presented to senior management of the customer at least three times. The initial presentation is intended to sell the services of the consulting firm to the customer. Once the consultant team is on board to investigate efficacy problems, the second presentation is a

progress report to inform senior management about preliminary diagnoses of operational problems. The last presentation concerns recommended solutions, costs, and benefits of the solution. These presentations are what sell the consulting firm's services and allow them to move from the evaluation of an organization to the implementation of the solution.

The senior-level client roles for this situation were played by hired executives portraying client executives or senior consultants in the firm: either senior consultants in the scenario or client executive roles if they had experience working with similar client executives.

Much of effective communication can be attributed to comportment. The audience could be one person, as in client interviews; a small group of people, as in collaborative team meetings; or a large group, as in presentations to the client. Body language, such as posture, demeanor, and eye contact are skills that influence the way one is interpreted. These skills often need to be taught. Extending some of the lessons learned in comportment, other skills in social relations, particularly critical listening skills, can also be taught. One criterion is the clear presentation of one's thoughts; and the other is understanding what is being communicated. Critical listening allows a consultant to draw reasonable conclusions from information found in various sources, such as an interviewee's response or a leading question from a CEO. Opportunities to exercise comportment and critical listening skills were available for all levels of consultants.

Target Learning Goal: Domain Knowledge

One of the primary objectives of the course was to teach basic industry knowledge and practices to the trainees. Business consultants are consistently asked to develop a new approach to a company's business strategy that would leverage their position in the marketplace. To meet these

challenges, competitors in the business-consulting industry typically focus on one of two distinct functions: business process and organizational redesign; and information systems strategy and development. Millennium Consulting practices both. Novice consultants had little or no knowledge of either business-reengineering process or information-technology strategy. To successfully service their customer in both areas, initial diagnostic procedures such as preliminary interviewing and process mapping were practiced during the Live GBS BPR course. Other skills specific to the BPR domain were incorporated in the course design. For example, course participants were exposed to work-sampling studies, performed to determine what tasks are being performed and what inefficiencies exist in their jobs.

Target Learning Goal: Company Philosophy

In addition to basic industry knowledge, certain doctrines within Millennium Consulting Partners were addressed and incorporated into the Live GBS course. Consultants at all levels of expertise needed exposure to and reinforcement of the client company's culture. The Live GBS course design reflected the firm's philosophy, working to foster a collaborative approach to service delivery to diagnosis organizational problems and provide recommendations.

Placing partners and principals together with less-experienced members on the team supported the company's underlying theory of effective learning. Partners and principals were experts in their field and their industry knowledge was passed on to the less-experienced consultants on the team in a mentoring fashion. These consultants worked in partnership with their client, the company hiring the consulting firm to evaluate and reengineer their business. In the training simulation, this partnership between the consulting firm and its customer created a symbiotic

relationship. Role-playing personnel representing the client company provided insight into its organizational background, structure, and politics.

In addition, involving the customer in the reengineering effort allowed them to take ownership of the business-reengineering process. In return, the consultants helped clients build a foundation for lasting organizational change.

Members of the consultant team were encouraged to continually develop professionally. Throughout the Live GBS course, senior consultants had the opportunity to model consultant behavior, lead a team, mentor neophytes, and hone technical and communication skills. New consultants, on the other hand, gained mental models of how experts use industry knowledge, strategies, and skills to solve problems and successfully complete tasks within the context of the course simulation.

Target Learning Goal: Technical Skills

The client team also had to be able to use resources such as Lexis/Nexis, MS Excel, MS PowerPoint, web search engines, and public statistical packages that enable the consultants to present a comprehensive analysis of short- and long-term effects of proposed solutions. In addition, members of the team needed to use spreadsheets and graphics programs to clearly communicate ideas to their audience.

Step 3: Identify a Typical Case with Opportunities for Learners to Practice the Learning Goals to Serve as a Model Case from which the Live GBS Simulation Is Designed

In keeping with the authenticity of the environment, the Live GBS course was based upon a real business reengineering case that experts completed. The client was a computer reselling company that brought Millennium Consulting to examine inefficiencies in their order-management process. Although Millennium Consulting had only one case involving business reengineering practice, this proved to be a good prototypical case.

Step 4: Distill a Narrative of Events from Documents and Events of the Model Case and Step 5: Create a Fictional Storyline with Events and Characters from the Narrative to Serve as the Foundation of the Scenario

The prototype was a real case from a real company to be referred to in this document as "Verisel". The Verisel project yielded a great deal of documentation. Millennium Consulting provided all of the text documents that arose during their discovery process, including hundreds of spreadsheets, memos, presentation slides and meeting notes. These documents were reviewed, and provided information describing when and why the consultants had used or produced them. The result of this close study was a narrative that captured the creation of each document in the case and resulted in a scenario influenced by activities and events in the course structure.

Following is an excerpt from the narrative of the model consulting case that formed the basic storyline of PB1:

Millennium was brought into their client, Verisel, to evaluate their strategic plan. The project began with an all-day meeting with senior staff in which Millennium asked to see Verisel's

strategic plan, but none was forthcoming. Ultimately, the Millennium consultants were shown Verisel's CEO's "vision," a one-page document that included a mission statement and some vague plans.

The team of consultants started by collecting public domain information on Verisel and interviewed personnel in the company. This was standard operating procedure for Millennium during a business-consulting project. The Millennium team, including junior and senior level consultants, interviewed 40 people from the site and from Verisel. The list of interviewees included vice presidents, account managers, and personnel from various departments in the company. The Millennium team also toured a number of departments in the company, including the distribution center, customer call center, and product configuration center.

One of the main concerns of the people interviewed was that there were two loci of power—the CEO and the president, each with his own style and his own constituency within the company. The CEO, with his Verisel background, emphasized the concept that every customer was important. The president, on the other hand, focused more on operational excellence. In the past, proposed changes had failed to be implemented due to conflict between the two of them.

In addition, interviews revealed that top sales people were very dissatisfied and had even discussed leaving the company. There was no commitment to the big accounts. The company was not growing the way the sales leaders hoped. Some of their authority was moving to a central customer center. The sales people felt that the customer center was responsible for all of the problems in order delivery, although the customer center felt that it was the sales people's fault for failing to complete purchase orders properly.

The interview subjects also said that there was neither a strategic plan nor career development opportunities. The Millennium team felt the leaders of the company did not have a good understanding of how difficult the changes would be.

Between the paucity of documentation and the results of the interviews, it became obvious to the Millennium team that there was no strategic plan to evaluate. They relayed this to both the CEO and the president in a conference call and offered to come back at a later date, after Verisel had come up with a strategic plan. The president and CEO convinced them to change direction, and focus on the order-management process.

The Millennium team was prepared to look at the entire order-management system from prospecting the customer to delivery of the product and service. However, the head of sales felt that all of the problems were based in the Customer Center. He did not want his area touched and the service aspect of the company was not really in place. The Millennium team was told to look at the process from order entry to inventory management and nothing else.

One of the partners met with the head of the Customer Care Center to talk about Verisel's proposed computer system for helping inside sales representatives do appropriate pricing. The Millennium team, headed by the principal partner, met with top-level people from Verisel to discuss issues regarding drivers, outputs, and measures. In addition, they began to draw out a basic level of understanding of order management. They then wrote up the results and presented them to Verisel's senior staff.

A week later, Verisel's CEO and senior staff met with the Millennium team. The CEO wanted to take action and hire the team to diagnose the problems with Verisel's order management.

Verisel's senior management selected a group of five vice presidents to work with the Millennium team: the vice presidents of the Customer Center, the Distribution Center, Sales, Human resources, and the Chief Information Officer. The Millennium team felt that the Verisel team was participating in this career for the experience: They felt that even if the reengineering of the order management process did not work, the Verisel team would at least be able to put the experience on their résumés. The Millennium team also wanted to work more closely with the senior staff to see if they could change Verisel's silo structure.

In the next weeks, the Millennium team took an in-depth look at the effect of order changes, credit holds, and other factors that can affect the order process. They walked invented orders through the sales process and through the Customer Center process. In addition they traced real orders as they went through the system.

They decided that the billing problem was not as serious as the communications problem. For example, sometimes purchase orders did not match orders received or the invoice so the purchasers could not issue a check to the company. Although bills were sent to the purchasers, the purchase order mistakes were not told to the billing department, so there was much confusion. The product received did not match the invoice or the bill.

During work sessions, the consulting team would propose hypotheses and senior Verisel executives would bring in their own center's numbers as evidence. However, upon further examination they discovered the numbers were untrustworthy.

Midway through the project, the lead consulting partner made a fateful presentation to the CEO and to the president of Verisel. It was intended to be about the results of the team's work.

Unfortunately, he showed a slide that was intended to differentiate the aspect of the order process they were focusing on from sales and service. At the mention of sales, the president of the company (who was protective of the sales department) was infuriated. He failed to understand that the team mentioned sales as an aspect they were not planning to focus on. The consulting team was asked to leave the room so the CEO and the president could talk with the senior staff who were the Verisel members of the team. The Verisel members defended the consultants and insisted that the work was worthwhile. They convinced the president to let the team go forward.

Step 6: Identify Issues From the Model Case That Can Be Mapped to Learning Goals

Studying the data and the narrative of the Verisel project revealed several political issues for the scenario's fictional company, Verisel. The team identified issues that essentially define a reengineering engagement.

The following issues were discovered:

- Verisel's two-headed organizational structure is neither useful nor is it easy to change;

  Orders are difficult to track through the various isolated systems used by the different departments;
- Actually getting Verisel to understand that their order-management process was broken took 6 weeks;
- Verisel wanted to unsuitably broaden the scope of the project;
- Verisel was frustrated with the rate of progress early in the engagement;
- It was difficult to get appropriate data from the information systems department;
- Some of the problems that surfaced in the interview proved to be overstated; and
- It was difficult to get Verisel to think creatively about major changes in the process.

The list of issues above is not complete because issues identified were too numerous for course participants to address within the Live GBS course. With the help of some very senior consultants, the issues were prioritized and limited for the Live GBS course. Expert guidance from the Millennium client was valuable in limiting and prioritizing the issues.

Generally speaking, issues are problems or challenges the team encounter through interviewing role players or other sources in the scenario such as documentation that hints at problem areas in the company. These challenges relate to the proposed mission and exemplify problems the consulting team has to solve. The issues they address require learners to use skills and knowledge identified as learning goals. Examples of tasks the learners performed are as follows:

- The teams made formal presentations to the CEO and executive staff of Verisel. In these presentations they delivered recommendations for changes on the basis of diagnoses of the current state and some benefit projections of moving to a desired state.
- The diagnoses were based on analyses and interviews.
- The analyses were based on data sources including projections the teams made for Verisel.
- The *projections* or forecasts that the teams made were based on other *data sources.*
- The teams also developed initial work plans and project costs for the recommendations for change.

Step 7: Build an Infrastructure to Support the Implementation of the Scenario

The following is a description of how the PB1 course for Millennium was conducted. Although the design of the simulation's schedule is usually shaped early in the design process, it can be iteratively refined during this step in the process. For example, the final activities for the business-consulting courses were presentations of the teams' final recommendations. In order to

reach the point in which they could perform this activity, teams had to begin with brainstorming activities in order to begin defining the problem. From there, they developed hypotheses and potential answers to help frame future activities built on information gleaned from previous activities.

Example: Millennium Consulting PB1 Course Tasks and Schedules

In the PB1 Live GBS design, the 5-day schedule for the simulation reflected the structure of a typical engagement:

Day 1: The first day began with a large meeting with all of the Live GBS participants. Ground rules were set, including an introduction to the client role players and an explanation of how to request help from data "gatekeepers" or simulated (via email) client assistants who, like real client assistants, can access reports, schedule interviews, and in other ways help with the data-gathering process. The large group separated into individual teams, which had their first team meeting in which the partner-level consultant explained the team's mission. Then the teams met with the client-sponsor role player, that is the client executive who is taking ownership of the project on the client's side and hired the consulting firm for the job.

The PB1 teams met with other client role players and asked questions about their company in order to begin creating hypotheses. The partner on each team acted as a mentor, facilitating and modeling this and other problem-solving processes when and where needed. The larger portion of the day was spent formulating hypotheses and planning data acquisition—figuring out interviewing protocols, data gathering, and hypothesis revision. Each day also included meetings in which the partners or one of the coaches observing the team facilitated small, informal

reflection sessions about a specific part of the diagnostic process that the team just completed. Team members talked about what their expectations were, what they learned, what further questions they had. The mentors or coaches, in turn, shared observations and their own experiential stories, and asked leading questions to get the team to reflect on their own experiences.

Day 2: The bulk of the day was spent developing a baseline process analysis, which served as the basic justification for the teams' diagnosis. The teams used this time to conduct follow-up interviews with clients, gathering more detailed data, identifying and sizing key issues, and completing their understanding of their business case so they could begin preparing their preliminary presentation to the CEO the following day. The day ended with team meetings with the business communication and interpersonal relations coaches who watched the teams throughout the day either in person or on monitors in the separate strategy area. The coaches gave the teams general observations they made during the day and facilitated discussion. In some cases, the coaches met with individual team members for one-on-one feedback.

Day 3: On the 3rd day the teams rehearsed their presentation and then presented the baseline diagnosis to the CEO, as is typical in consulting projects. After the presentation the teams debriefed with the partner (mentor), client CEO, and coaches, who had a videotape of the presentation. After the debrief, the teams refined their business diagnosis, and began to design the idealized future recommended course of action. At the end of the day, the teams had short meetings with the coaches to talk about progress made in team dynamics and communications.

Day 4: The first half of the day was spent developing a transition plan the client could use to move from their current state into the idealized future state. The teams prepared to present this

idea to the CEO as a trial to test his reaction and adjust the recommendations accordingly. The last half of the day was spent developing the final presentation to the client, including all role-play executives. The teams worked on refining the business case and the cost-benefit analysis.

Day 5: The hour before the final presentations were scheduled, the teams rehearsed, then presented the diagnoses and recommendations to the clients, role-played board members, and partners. The clients and partners reacted as they would in a real client presentation. In one presentation, the team was shocked to find that they did not get the job. Their findings and recommendations were sound. They did not get the job because they simply never asked for it. They focused on presenting their business case, but neglected basic protocol. After each team watched other teams present, the teams met with clients out of role, and coaches and observers from the consulting firm for a small group debrief. Then all of the participants gathered for a large group discussion in which experienced consultants compared this engagement with their previous experiences.

Step 7a: Design Culminating Activities and Reflection Periods

The course was structured around a case. Consultants participating in the Live GBS worked together in two teams of seven consultants of varying levels of experience: one partner, four principals and two associates. Each group worked with separate Verisel staff, who were basically course designers and personnel from the consulting firm playing Verisel employee roles, and course operators working behind the scenes. The same set of coaches provided guidance and feedback, monitored activities and made sure the authentic simulation ran smoothly. At the end of each day, individual teams held reflection sessions to review lessons learned from the day's

activities. The reflection sessions were facilitated by their team mentors and either the communications coach or analysis coach, if their expertise was required.

Trainees received an engagement packet with some background information about Verisel (public information, annual reports, etc.) on the Monday prior to the course implementation, so that they would have ample time to prepare. On the Wednesday evening of that week, each group of trainees had a conference call with two course operators, senior consultants at the firm, who were posing as the engagement team. This was their opportunity to clarify basic questions before serious work began on Monday.

The teams were encouraged, but not required, to meet the day before the opening of the project to orient themselves to the case. They also had access to the engagement team during this period if they had any questions about the case. The partner who required his team to take advantage of these opportunities met with much greater success than the one who did not. This proved to be a valuable lesson for partners as well as junior team members.

On the Sunday evening before the Live GBS simulation, teams met under the direction of their partner to discuss plans for the upcoming week. The teams had a good understanding of basic information about Verisel at this stage.

On Monday morning, the Live GBS began. Each group met with the person playing the CEO of Verisel for their team to go over the engagement packet and clarify intentions for what the consultants would accomplish over the course of the week. After the first meeting, the consulting teams were introduced to Verisel personnel who would become members of the teams for the duration of this project. Each group of consultants joined with the CFO and the Customer

Service Manager of Verisel to form a consultant–client team. It was decided during the early part of the week that teams would meet in the mornings and early afternoons. Late afternoons and evenings were spent preparing presentations or in reflection sessions.

This plan was interrupted in several ways. Often, one or two consultants were dispatched by their teams to perform interviews with various members of Verisel's staff. Some trainees maintained email correspondence with on-line clients, and coaches met with each trainee two or three times during the implementation. On occasion, Verisel CEOs paid unscheduled visits to team rooms.

On Wednesday, each team made a midweek report to the CEOs. The CEOs were exacting in their requirements. Verisel staff members were not on the premises Thursday, enabling the trainees to prepare their final presentations.

Friday morning began with a large group meeting, with both Verisel CEOs, course designers, part of the consulting firm's executive committee, and both teams. Each team presented their findings and recommendations before the entire group. The CEOs and the executive committee gave feedback, and the course ended with a debriefing session on the training itself.

Step 7b: Develop the Roles and Foci of Role Players, Mentors, and Coaches

Role players. Novice consultants needed to interact with role-play personnel to help gather data and to answer their questions. A few executives, former CEOs of companies and high senior executives at Millennium Consulting, acted as executive officers of Verisel. The design team, instructional designers, and the Millennium Consulting personnel, acted as the Verisel CEO's executive assistant, Verisel customer service representatives, Verisel's vice president of sales, and other client personnel who were of assistance to the consulting teams.

Coaches. An experienced corporate psychologist and an experienced corporate communications trainer participated in the Live GBS course as coaches. They were also asked to help define their roles. The corporate psychologist acted as the team dynamics coach, focusing on issues surrounding team building. The corporate communications trainer acted as communications coach for the teams. They provided both feedback and practice in metacognitive self-assessment to the trainees.

Coaches observed the video monitors, team meetings, and informal status meetings for senior consultants. The coaches met with team members regularly, one-on-one, to provide feedback and facilitate learners' reflections. These meetings were conducted in role as far as possible. For example, the communications coach, in role as a senior Millennium executive, pulled a junior consultant from a team meeting to request status briefings and then, in character, gave performance-related feedback immediately afterwards.

Mentors. Experienced consultants on each team modeled what they would do in an actual engagement, and how they would go about doing it. They did this by discussing the situation with the team and, as a group, coming up with logical areas to begin researching. They also encouraged new consultants to practice skills they would not ordinarily perform until they gain more field experience, such as interviewing CEOs. The course operators met with the mentors periodically to discuss their observations on the video monitors, and what strategies could be used to direct or redirect the teams (e.g., having the CEO stop by for and react to an impromptu update.) In subsequent runs of the Live GBS that Millennium Consulting ran on their own, the mentors knew more about the resources and data, yet were careful not to let their team know that they knew more information than they said. They were also encouraged to tell course operators

when they felt their team needed redirection and to suggest methods that would be the right redirection for the team.

Step 7c: Design and Prepare the Behind-the-Scenes Strategy Area

The first two implementations were operated by the Live GBS design team, ILS researchers and Millennium Consulting personnel. Subsequent implementations were run by the consulting firm alone.

In gathering information, the teams of consultants used electronic mail to ask questions to clients. The course operators accessed a database of answers based on identified issues and corresponding issue scripts to respond to the email questions. In addition, they were responsible for updating the database during and after the implementation.

Step 7d: Create a Realistic Physical Environment to Maximize the Authenticity of the Simulation

The physical space in which the simulation took place was Millennium Consulting's office space, which, in some cases, would be where consultants would spend much of their time working on projects. For a case like Verisel where the consultants were evaluating an order-management process, they would typically have to try an order process to see where bottlenecks and other inadequacies lay. That is, a consultant would physically walk an order from the beginning, at the order quotations desk, to the end at distribution to see which areas needed to be rethought in order to assess how to get a real order through the process more efficiently.

Course staff, such as the course designers and members of the consulting firm who helped design the course and operate the implementation, had a separate strategy area away from the team

meeting rooms, and coaches had a small office in which to conduct meetings with individual trainees.

Step 7e: Use Technological Resources to Aid the Flow of the Simulation

Each trainee had access to a networked laptop equipped with email, a word processor, a spreadsheet/graphing program, and presentation software. Email was used in the local area network so the teams could send questions and data requests to role players. The spreadsheet programs that Millennium Consulting used regularly were used in the simulation so the team could learn and practice graphing and analyzing data in the applications they would use in the field. Presentations to Millennium Consulting's clients were typically presented in PowerPoint. The teams spent much of the time on the 4th day familiarizing themselves with the program and putting together their final presentations to Verisel executives in PowerPoint. In addition, video was used quite extensively to monitor the teams during the week so the course operators, coaches, and mentors could observe the teams in action. Coaches also used video to play back events to participants and give individualized feedback on their performance.

Step 7f: Create the Textual Resources Such as Background Information on the Fictional Client and the Project

Because of the limited time period of the implementation, background information was provided prior to the week of training through a course book. This volume included an engagement packet, a schedule of events, and an overview of the firm's approach to reengineering. In the field, an engagement packet is a proposal written by a small group of consultants who have made an initial study of the client's business, and contracted the engagement. For the training, the

proposal provided a high-level analysis of Verisel's business, especially the order-management process, and contact information for the human and the computer-based client characters.

Live GBS #2: The Practice Basics 2 Course

The second Live GBS design named PB2 is the second course in Millennium Consulting's core training curriculum that took place 1 year after the design for PB1. PB2 is a continuation of PB1. Whereas PB1 focused on diagnostic activities, PB2 concentrated on project-implementation activities. PB2 built on the success of PB1 and the overall structure and design of this course was very similar to PB1. The design of this Live GBS strays from the ideal Live GBS design at steps 1, 3, and 7 (Table 1.) Overall, it recreated Millennium Consulting team settings throughout the simulations: course participants interacted extensively with client executives, and the in-depth analyses were supported by Millennium Consulting cases and detailed supporting materials. The infrastructure of the two courses was largely the same for design Step 7, so the discussion here will focus on the first six steps in the PB2 design.

Table 1: Design Process for PB2 Live Goal-Based Scenario

Expert Design Process	Areas in which PB2 deviated or differed from this step
Step 1: Form a cross-functional design team consisting of instructional designers and subject matter experts	The cross-functional design team relied less on theory experts because the subject-matter experts were familiar with Live GBS design. Design architects were used primarily as advisors rather than active designers.
Step 3: Identify a typical case with opportunities for learners to practice the learning goals to serve as a model case from which the Live GBS simulation is designed	Because no individual case had examples of each of the six project types the course was to simulate, the model case contained six different project types. At least one real-life case example contributed to the creation of each of the six fictional projects in this simulation.
Step 4: Distill a narrative of events from documents and events of the model case	Six specialized projects, based on actual cases, were incorporated into one narrative. The overarching storyline was invented.
Step 7b: Develop roles and foci of mentors, coaches, and role players	In PB2, interpersonal communications and team dynamics coaches' roles did not exist. Instead the team mentors, the senior experienced consultants heading each team of learners, took on the responsibility of coaching their teams in these areas.

Step 1: Form a Cross-Functional Design Team Consisting of Instructional Designers and Subject-Matter Experts

There are few differences in design between PB1and PB2. The first occurs in Step 1 of the design process. There were fewer theory experts on the cross-functional design team because the general problem-solving framework design was very similar to PB1. Millennium Consulting felt that the theory experts from the PB1 design team could play a less integral role in the design of

PB2. As a result, the principal theory experts for PB1 were more of a presence in the first stages of the design, identifying learning goals and finding prototypical cases. However as the data gathering process began, the theory experts took on a more advisory role and the composition of the main design team was composed almost entirely of Millennium personnel.

Although there was less time available to complete the PB2 design (3 months as opposed to 6 months for PB1's design), the design team was familiar with Millennium resources, which minimized the learning curve and enabled them to make more efficient use of the time. They could easily access previous cases and senior executives as experts on specific program management issues.

Step 2: Define the Learning Goals of the Live GBS Course by Identifying Skills and Domain Knowledge Participants Will Need to Learn

Shortly after the design of PB1 was complete, project management emerged as one of Millennium's core competencies. Project management thinking was relevant across much of Millennium's service scope, including the information technology side, and engagements that focused on project management provided skill development opportunities at all levels.

More specifically, PB2 focused on planning and analyzing tasks with project-management activities. Project-management tasks included creating project and program plans; designing management and control systems; diagnosing and assessing program; problem-solving, such as defining a problem or recognizing a problem area and taking action; communicating with and managing clients and members of the firm at all levels of the organization; and finally thinking with the whole program in mind, such as integrating and managing multiple projects.

In comparison to the PB1 design, the design team had a better defined view of what participants at the associate level and mentors at the principal and partner levels would gain from the course. A document produced by senior members of the design team divides the skill types into three groups: architecture (project design) skills; project management skills; and personal growth skills.

Target Learning Goals: Associate Skills

Architecture Skills:

- expertise in at least one architectural model, such as data warehouse, sales-force automation, call center, or other transaction based on customer service
- technical communication skills such as the ability to clearly communicate technical concepts to peer group as well as technical audiences

Project Management Skills:

- ability to participate as a team member in projects to design, develop, and implement systems architectures
- ability to report status and progress
- ability to identify issues and risks
- ability to identify and estimate project tasks
- ability to monitor team-member progress

Personal Growth Skills:

- ability to develop critical listening skills
- ability to develop informal group communication
- team building skills
- client/consultant communication skills

presentation skills

writing skills

interviewing skills

ability to mentor and assist in the development of fellow Millennium professionals

Target Learning Goals: Principal Skills

Architecture Skills:

expertise in at least one architectural model, such as data warehouse, sales-force automation, call center, or other transaction based on customer service

technical communication skills such as the ability to clearly communicate technical concepts to the peer group as well as technical audiences

ability to identify critical architectural design decisions and propose solutions for review

ability to state architectural tradeoffs in relevant business terms

Project Management Skills:

ability to take ownership of a piece of an engagement

ability to lead small to medium projects

ability to assist in preparing project plans

ability to establish project management tools

ability to administer/oversee project-management logistics

ability to prepare periodic tracking and progress reports

ability to develop task plans

ability to monitor team-member progress

identify issues and risks

Personal Growth Skills:

mentoring skills—ability to assist in the development of fellow Millennium professionals

team building skills

client/consultant communication skills

presentation skills

writing skills

interviewing skills

Target Learning Goals: Partner Skills

Architecture Skills:

expertise in at least one architectural model, such as data warehouse, sales-force automation, call center, or other transaction based on customer service

technical communication skills such as the ability to clearly communicate technical concepts to peer group as well as technical audiences

ability to relate architectural decisions to business issues and impacts

ability to identify and make critical architectural-design decisions

Project Management Skills:

project planning skills—ability to lead large and/or complex projects to plan, analyze, design, implement, and rollout systems architectures

ability to develop and integrate work plans for multiple projects with shared resources and dependencies

ability to manage client relationship and client expectations

ability to identify key risk areas in a project/program plan and design strategies to manage/mitigate the risk

ability to communicate project status, risks, and issues with client sponsors

ability to map plans into particular methodological practices of a client

Personal Growth Skills:

mentoring skills—ability to assist in the development of fellow Millennium professionals

team building skills

client/consultant communication skills

presentation skills

writing skills

interviewing skills

Step 3: Identify a Typical Case with Opportunities for Learners to Practice the Learning Goals to Serve as a Model Case from which the Live GBS Simulation Is Designed

There were challenges involved in finding a prototype case to teach project management skills. Project management engagements are difficult to simulate realistically because real projects often take months or years to complete and they often involve large client- or contractor-development teams. The design team and senior consultants decided the best way to solve this would be to focus on something that would provide a practical basis for creating a realistic, yet manageable simulation. They decided to focus on plan analytics, because pitfalls and problems of project management can be learned by diagnosing existing flawed plans. Also, the basics of learning sound program management can be learned by constructing a revised plan for going forward.

At this point the design overlapped with the next step in the design process, creating a scenario. Although a prototype case or cases had not yet been solidified, the main focus of the scenario was already under development. The team goal for PB2 was to salvage a client's implementation effort. The fictional client would have a number of discrete projects underway, each with its own problems including:

Poor communication between project teams;

No meaningful metrics for tracking progress;

Project managers were not focused on completion;

Projects assume unrealistic transition plans; and

Project scope and resource allocation are not aligned with the business case.

Unlike the situation surrounding this design step in PB1, there was not an example of a singular project with problems encompassing all of the project management learning goals. The design team drew upon six types of projects from eight of Millennium Consulting's previous engagement experiences and used at least one actual case example from each project type to construct a Live GBS scenario around them. The six types of engagements were:

process reengineering;

call-center implementation;

sales-force automation;

data warehouse implementation;

electronic commerce strategy; and

IT organization consolidation.

Step 4: Distill a narrative of events from documents and events of the model case

Because there was no primary case that the design team was going to use as the basic framework for the course, they created an overarching storyline in which the team of learners' mission was to salvage the client's attempted effort to implement reengineering recommendations from a previous Millennium engagement. Each of the six types of project-management engagements

and the examples were drawn from at least one actual case example that could be used in creating a narrative for the Live GBS. Each of these cases had a story to tell with problems that needed to be solved, and a Millennium Consulting team that investigated, diagnosed, and solved and/or corrected the problem. The Millennium design team used one example from one of the sales-force automation cases that told a story about a company that needed to transfer some of the bookkeeping to their door-to-door salesmen out in the field. This would allow the company to replace all of their back office staff as well as let the sales people make presentations to customers. However the project failed because they used communication software that did not match up to performance criteria in the real world. Millennium began to figure out how to fix this problem while meeting the original needs of the sales force's transfer to technology. Just as this story was incorporated into the scenario, the rest of the narrative incorporated relevant stories from each of the six example cases that uncovered issues that the learners would have to look for and solve.

Step 5: Create a Fictional Storyline with Events and Characters from the Narrative to Serve as the Foundation of the Scenario

The overarching scenario created for PB2 continued Millennium's involvement with Verisel, the client company from PB1. A year earlier Millennium left Verisel with a recommendation for reengineering their order processes and systems. In fact, Verisel spent the year implementing Millennium's reengineering and systems recommendations on their own. However, buoyed by their initial success, Verisel greatly expanded the scope of these initiatives and the CEO determined that the changed agenda is beyond their internal capabilities. Millennium was invited back in to get the program back on track.

Although this scenario worked out, there were concerns that it would be developmentally problematic. Basing PB2 on PB1 required developing a model solution to PB1 to serve as a starting point for PB2. It also entailed mapping multiple engagement experiences, like the one above, to a common storyline. But there were pedagogical advantages to basing PB2 on PB1. First, it leveraged the knowledge participants gained from attending PB1 . Second, it contributed to the development of creating a common language throughout Millennium consultants' culture.

Step 6: Identify Issues From the Model Case That Can Be Mapped to Learning Goals

Each of the real business engagements used as prototypes allowed the designers to address project-management-related learning issues. With the help of key Millennium personnel on each of the six real cases they were able to extract specific project management issues from the engagements and map them back to learning goals. Some of the learning issues that were linked to the real project management cases were:

Reengineering Implementation (Two Real Cases Used as Prototypes)

The full benefits of reengineering will not be realizable without radically changing the process;

Learn to simplify the processes you are working on before you implement new technologies; and

Identify the point of maximum leverage for the client and focus on that.

Call-Center Implementation (Two Real Cases Used as Prototypes)

Learn how to balance benefits of call centers and customer service teams; and

Learn to consolidate multiple call centers.

Sales-Force Automation (Two Real Cases as Prototypes)

Learn to set goals that are realistic for the client's future;

Plan for roll-out and training needs; and

Estimate and evaluate system performance and scalability.

Data Warehouse Implementation (One Real Case Used as Prototype)

Learn to use a proof-of-concept prototype to supplement soft business cases.

Electronic Commerce Strategy (One Real Case as Used Prototype)

Reconcile incompatible client demands; and

Deal with reactive client posture.

IT Function Consolidation (Four Real Cases Used as Prototypes)

Select appropriate dimensions for IT evaluation;

Resolve incompatible technical cultures;

Resolve incompatible technical architectures; and

Create a fact base in order to drive change.

Step 7: Build an Infrastructure to Support the Implementation of the Scenario

The features of this step and related substeps involving infrastructure support in the PB2 Live GBS simulation mirror those of PB1. The activities learners focused on still centered on developing analytical skills specific to the project area of the simulated project (such as sales-force automation or electronic commerce), project management skills (such as project planning and building client relations), and personal growth skills (such as interviewing clients). The

regular reflection periods with mentors that enabled learners to extract lessons from daily activities and milestones such as midpoint presentations to the client, meetings with senior level executives in the consulting firm, and other presentations and meetings were also very similar to those of PB1. Other elements such as the physical environment in which the simulation took place, the technological resources available to participants, preparatory material given to participants before they arrived, the strategy room with course operators and databases filled with answers and data for potential questions asked by learners, and the format of the schedule as well as the project background information were also unchanged from the PB1 simulation.

The only design changes and developments in this step occur in Step 7b: *Develop roles and foci of mentors, coaches, and role players*. In PB2, the interpersonal-relations coach and team-dynamics coach roles were eliminated. Because the team mentors were experienced consultants with success and familiarity with working in teams and communicating with teammates and clients, and because they worked closely with teammates in the simulated project and understood their behavior better than roaming coaches who had to divide their time and attention between groups, giving the team mentors the responsibility and opportunity to coach their own teams in these areas was the logical choice. They were also able to assist role-players and course designers behind the scenes in the strategy room by bringing attention to areas in which the team needed focus. For example, if the team seemed too cavalier or passive in their approach to preparing for a client meeting, the mentor informed the role players and designers of this and an impromptu client meeting occurred, as is common in the field, forcing the team to redirect their focus onto the problem they were addressing and giving them an opportunity to hone their 2-minute summary skills in which they clearly and succinctly outlined their progress to the client.

Live GBS #3: Government Health Agency Chief of Staff Course

The third Live GBS course was designed for a government organization, the GHA, to be included in their existing training program for new hospital COSs. Fifteen hospital COSs participated in the Live GBS. Three working groups of five COSs and one team mentor comprised each team. The course replaced 2 days of their existing 2 week-long curriculum. Lack of resources, subject matter experts, and time restraints prevented an ideal process and, as shown in Table 2, the design process of this course differed from the ideal in several ways.

Step 1: Form a Cross-Functional Design Team Consisting of Instructional Designers and Subject-Matter Experts

The COS–Institute liaison was not as integral a part of the design team as suggested it should be. The intention to dedicate a percentage of time toward helping the team locate and retrieve data from agency hospitals, networks, and stakeholders such as hospital, community, and health associations across the nation, did not come to fruition. As a result, the data-gathering process was prolonged as the design team spent a great deal of time seeking data sources, gathering, and analyzing data from an untutored perspective.

Table 2: Design Process for GHA Live Goal-Based Scenario

Expert Design Process	**Areas in which GHA Chief of Staff course deviates or differs from design process**
Step 1: Form a cross-functional design team consisting of instructional designers and subject-matter experts	Subject matter experts were not integral members of the design team. Thus, data gathering was slowed in places and data was analyzed from an untutored perspective.
Step 3: Identify a typical case with opportunities for learners to practice the learning goals to serve as a model case from which the Live GBS simulation is designed	The concept of hospital networks was relatively new to the GHA so there were no solid cases of a single hospital network encountering the sort of situations the COSs needed to encounter in the simulation. Because of this, a new model case focused on a representative network and service consolidation.
Step 4: Distill a narrative of events from documents and events of the model case	Rather than have a single storyline narrative of a case, separate narratives of five hospitals, each with its own history, were made.
Step 7a: Design culminating activities and reflection periods	Because of time constraints, there were no facilitated reflection sessions during the Live GBS, but rather a larger debrief between learners and designers after it was over.
Step 7b: Develop roles and foci of mentors, coaches, and role players	A real hospital network director was not available as role player for this simulation. An experienced hospital COS, familiar with working within hospital networks, acted as a network director.
Step 7c: Design and prepare the behind-the-scenes strategy area with a database of answers to anticipated questions from learners and monitors to unobtrusively monitor teams	The amount of information normally available to COSs was limited. Data was created to fill in gaps of information so the problem-solving process would not be hindered, but not all learners' questions could be answered.
Step 7d: Create a realistic physical environment to maximize the authenticity of the simulation.	This Live GBS was part of a conference held in a hotel; therefore the simulation took place in an inauthentic environment.
Step 7e: Use technological resources to aid the flow of the simulation	Communication between teams and the strategy room was slow because of lack of technology to send or receive timely messages or create new documents during the simulation.

Step 2: Define the Learning Goals of the Live GBS Course by Identifying Skills and Domain Knowledge Participants Will Need to Learn

The purpose of the 2-day session was to simulate aspects of the day-to-day life of a COS in a way that enabled him/her to practice and build relevant skills. The players agreed that the course needed to focus on a complex problem of organization redesign.

Based on extensive interviews with agency COSs and hospital network directors the following areas of knowledge and skills were designed to be learned by trainees during the simulation:

- Develop negotiation skills by negotiating for resources with internal hospital and network stakeholders (hospital staff, hospital network COSs);
- Develop conflict-management skills;
- Develop leadership skills to manage organizational and cultural change through
- Team building among the hospital network Planning Board;
- Relationship management (i.e., with stakeholders);
- Transforming the organization's culture to view hospital services from a network perspective, rather than individual member hospital perspective;
- Identify and analyze the data relevant to the consolidation and/or integration of a service;
- Identify relevant data to assess current efficiency of hospitals within a hospital network (volume, quality of service, staffing etc.);
- Evaluate operational costs of service;
- Compare hospital operational costs to other facilities in the private sector and within the agency;
- Plan the implementation of service consolidation and/or integration; and
- Develop and justify the service consolidation and/or integration strategy by participating in negotiations with other COSs on the hospital network team that address issues such as quality of care and service, regional operating costs, and staffing.

Step 3: Identify a Typical Case with Opportunities for Learners to Practice the Learning Goals to Serve as a Model Case from which the Live GBS Simulation Is Designed

In this course, new COSs participated in a simulated Network Planning Board for a GHA hospital network. A hospital network is a network of agency hospitals within a prescribed geographic proximity, and a Network Planning Board is a group of COSs within a hospital network who meet about, negotiate over, and create solutions for problems and issues that affect the network. In the Live GBS, the COSs had to confront the challenges associated with planning for service consolidation in light of impending budget cuts.

The concept of hospital networks was relatively new to the GHA and there were no solid cases of a single hospital network encountering situations encompassing the complete list of learning goals. Therefore, based on the service consolidation premise, a representative hospital network was used as the basic setting to which embellishments of situations and issues from other hospital networks were added to address learning goals.

The Minneapolis hospital network provided a sound foundation from which a fictional hospital network could be built. The hospital network director had encountered the service consolidation issue once before and the hospital network contained a good mix of hospitals typical of those found in other hospital networks across the country as well as some of the political and geographic complexity necessary when facing physical and logistical issues in service consolidation.

However to provide some of the political complexity needed to create interesting problems for the COSs to work through, designers modeled some of the hospitals in the fictional hospital network after those from other hospital networks that contained the missing political elements.

For example, one of the hospitals in the Minneapolis hospital network was affiliated with a major university and had some prestige as a teaching facility. This hospital did not have any major competition from other hospitals in the prototype hospital network. Because the learning goals included negotiation skills, it was important to incorporate competitive aspects into the scenario to create reasons for the participant playing the COS for this hospital to want to protect this hospital's interests during negotiations about consolidating services within the network. One method used was to create a competitor in the same league as this hospital by modeling one of the midsized hospitals in the hospital network after another university-affiliated hospital with strong political issues and a comparable level of prestige.

Step 4: Distill a Narrative of Events from Documents and Events of the Model Case

In this simulation, new COSs participated in a simulated Network Planning Board for a GHA Network and confronted the challenges associated with planning for service consolidation in light of impending budget cuts.

Service consolidation was a compelling choice for use as the basis for activity within the simulation. Recent reorganization of agency hospitals into hospital networks has forced organizations to consolidate services to eliminate duplication. Additionally, industry-wide calls for efficiency and productivity in the healthcare sector had made service consolidation a current and pressing issue in hospital networks across the country. Moreover, through interviews with hospital network directors, designers came to believe that service consolidation provided an excellent vehicle for helping new COSs make a transition from viewing the hospital's functions or services at parochial, micro-levels (one service in one hospital) to a macro-level (all services within a network).

Designers developed a problem—consolidation of joint replacement services—that had to be solved through careful analysis of the situations, negotiation, and compromise, and created narratives that told the stories of each of the five hospitals: each hospital had a shallow political history, a set of internal and/or community stakeholders, and assets to protect.

Trainees were encouraged to use the political and quantitative information relevant to their hospital to develop creative solutions to reducing inefficiencies during the simulation while confronting a variety of tradeoffs, such as quality of care versus cost. Trainees learned and practiced the skills necessary to perform a fact-based analysis of a problem, including gathering and analyzing data, verifying the accuracy and relevance of the data, and benchmarking data to industry and regional standards. In addition, trainees learned and practiced a variety of soft skills, including negotiation, persuasion, and team-building skills with a number of different stakeholders.

Step 5: Create a Fictional Storyline with Events and Characters from the Narrative to Serve as the Foundation of the Scenario

Because there were five hospitals in the Live GBS hospital network, the course participants were divided into groups of five for the duration of the course. Within each group, each participant played the role of a COS from one of five hospitals within the fictional Royale City hospital network. At the outset of the course, each group was informed that they had been called together by the hospital network director to form a Network Planning Board. The hospital network director charged each group to develop an implementation strategy that consolidated the joint-replacement services provided within the hospital network in order to meet impending budget cuts. The Royale City Network currently supported three joint-replacement programs that

performed less than the recommended number of joint replacements per year. The team was directed to gather data on the Network programs and the recommendation that at least one hospital discontinue its joint-replacement service.

Through meetings and interviews with hospital COSs and hospital network directors, designers retrieved recommendations for types of hospitals to use in the scenario and real hospitals upon which to base fictional ones. These COSs and directors were knowledgeable about numerous agency hospitals across the country and about issues concerning service consolidation and other services. In one meeting with three COSs and one hospital network director, general issues within the service consolidation topic were identified, including types of hospitals that would have interesting issues to deal with internally, and types of hospitals to include in the scenario to paint a picture representative of the political and logistical issues a COS would have to face. Each of the five fictional hospitals was modeled after one or more real hospitals to ensure realism and accuracy.

Step 6: Identify Issues From the Model Case That Can Be Mapped to Learning Goals

Realistically, there were not as much high-quality data available relevant to the cost, utilization, and quality of a particular service, such as joint-replacement surgery, as a team of COS studying service consolidation might hope. After numerous meetings and phone conversations with a number of agency personnel, designers arrived at a matrix of factors that the quality assurance advisors—from the client end—believed to be an adequate basis for making such a decision. In fact, they noted that the matrix contained more data than the COSs of the prototype hospital network considered when making a similar decision in reality.

Two quality assurance meetings with agency personnel confirmed the validity, viability, and engagement of the course scenario, as well as the adequacy of the data in the matrix for supporting the students' task. The first meeting was held with the Minneapolis hospital network director and head of the COS Institute Steering Committee focusing on details of the problem scenario and the plausibility of data. The second meeting was held a week later with two experienced agency COSs. It focused on the plausibility of data and on stakeholder issues.

In addition to quantitative data, a significant body of qualitative information, in the form of stakeholder issues, was amassed. Stakeholders included government service organizations, members of Congress, medical center staff, and deans of affiliated medical schools. These issues were disseminated selectively to participants, such that each COS in a working group was given one or two serious stakeholder issues to consider in reaching a decision.

Below are some political issues identified for each hospital in the Live GBS scenario that evolved from interviews with COSs, a hospital network director of operations, and representatives of community groups identified as stakeholder models.

Royale City

Very strong dean of the medical school;

COS has little control of day-to-day activities; and

Resident physicians have a high level of control, although the deans are not helpful.

Franklin

Director is politically connected through his family;

High support from Congress;

If Royale City closes its joint-replacement services, Franklin Hospital's affiliation gains additional prestige;

Strong outreach program; and

Hopes to attract referrals from Hewson Memorial Hospital for joint-replacement services.

Wynne County Hospital

Wynne County enjoys strong congressional support;

Wynne County's director is protective of its limited resources; and

Wynne County has strong support from community service organizations.

Hewson Memorial Hospital

Hewson Memorial believes that patients referred to Royale or Franklin Hospitals are not treated as well as patients referred to Wynne County; and

Hewson Memorial would support the consolidation of services between Hewson Memorial and Wynne County.

Sudbury Central Hospital

The county in which Sudbury is located has had two factory closings;

The town enjoys strong union support;

There is strong support for the agency from government and factory workers;

There is significant pressure on the director to change the hospital to an outpatient facility; and

Sudbury worries that consolidation efforts will help to eliminate the hospital's surgery, anesthesiology, and radiology services.

Step 7: Build an Infrastructure to Support the Implementation of the Scenario

During the weeks spent designing the course, designers worked intensively with several GHA personnel—including members of the steering committee (who were direct clients), hospital

network directors and their staffs, and others—to help shape the course structure and suggest authentic tasks and activities to be designed into the course.

Step 7a: Design Culminating Activities and Reflection Periods

Through telephone discussions with the Steering Committee, it was agreed that 2 days would be allocated to the course, however they wanted to end the course by noon of the second day to allow time for individual meetings between attendees and their mentors. Discussion with the director of the Minneapolis hospital network correctly suggested that, given the nature of the problem, the amount of information available to the COSs, and actual experience with a working group addressing a similar problem within his hospital network, it was reasonable to expect the course to end by noon of the 2nd day.

Broadly speaking, the first day of the course was devoted to understanding the problem, data gathering and analysis, contemplation of stakeholder issues, and reaching a consensus. These activities were interspersed with coaching on both the analytical aspects of the problem and on team-building, collaboration, and negotiation. The second day was devoted to preparing and giving a presentation on the group's decision and to reflection on both the issues and the process.

To illustrate the culminating activities in the context of this Live GBS, the 2-day GHA COS course ran as follows:

Day 1. The first day began with a meeting called by the hospital network director. In that meeting, the director reiterated the content of a memo previously distributed to trainees. Prior to their arrival at the COS Institute each COS received a packet describing the hospital and joint-

replacement service that they represented, as well as the hospital network's mission to consolidate those services.

After the briefing with the hospital network director, the trainees spent approximately 6 hours developing their teams and gathering and analyzing the data required to develop a consolidation plan. The data made available to each team member (each playing the role of a hospital COS) included:

Hospital demographic information;
Number of joint-replacement procedures per year;
Forecast of future need for joint-replacement services;
Number of referrals;
Hospital and physician charges for service;
Estimated cost of payment and physician charges for contract care of agency cases;
Cost to contract service to the private sector;
Staffing levels;
Patient transfer costs;
Quality of care;
Affiliation history; and
Estimate of potential hospital network-wide cost savings.

After collecting the appropriate data, COSs were asked to compare their hospital's data to other facilities (e.g., other GHA hospitals, hospitals in the private sector). During the completion of these activities, the COS data-analysis coach supported the teams by helping the new COSs identify and make sense of the data for their hospital.

While completing data gathering and analysis activities, each COS received a communication (via memoranda) from stakeholders of their respective hospitals. This communication required the COS to consider the data in light of the interests and concerns of people and organizations affiliated with each hospital. For example, any major change to a joint-replacement service made by a large hospital affiliated with a medical school was of serious concern to the medical school dean. In this instance, the COS was required to plan how to negotiate not only with the dean, but also with other members of the hospital network when addressing the political implications of the consolidation plan. Mentors and the hospital network director (see role descriptions in the next section) were crucial at this point to help the new COS understand the priorities of the hospital network and learn how to communicate with stakeholders.

Toward the end of the first day of the simulation, each team member:

Understood the data associated with joint replacement in his/her own hospital; and

Understood the data and issues associated with other team member's hospitals.

Day 2. During the first half of Day 2 (approximately 4 hours), team members convened to develop a hospital network consolidation plan for joint-replacement services and then developed an implementation strategy for the plan. It was anticipated that there would be several issues that would result in conflict during strategy development. For example, designers believed that each COS would maintain different perspectives related to the consolidation that may conflict with other team members (e.g., affiliated hospitals vs. nonaffiliated hospitals). These conflicts required team members to negotiate, resolve conflict, and manage team relationships.

After completing the implementation strategy, teams worked together to develop an informal presentation for the hospital network director. The presentation communicated the overall plan and, in addition, addressed the main issues identified by each team (e.g., affiliation, service closing, customer satisfaction). Next, teams spent approximately 1 hour with the hospital network director to present their plan and receive feedback. Presentations were followed by questions and learners' comments from the hospital network director and director of operations, but no discussion by the large group was allowed at this point.

Finally, all teams participated in a 1-hour debrief and reflection session to discuss the events of the 2-day simulation.

Reflection session. Following the final presentations, the hospital network director role player facilitated a discussion about the substantive issues of the problem. Perhaps the most significant result of this discussion was an analysis of the factors that led to differences in the groups' deliberations:

- Differences in group dynamics;
- Different working assumptions;
- Differences in expertise within the groups (e.g., surgeons vs. nonsurgeons); and
- Differences in old vs. new agency culture.

After lunch on Wednesday, a member of the COS Institute's Steering Committee facilitated a discussion with all of the learners about their opinions regarding using collaborative skills in the course. Representative participants' comments are summarized below:

- The exercise is not intended to be adversarial. Creating an adversarial environment in the course reinforces old, bad values.
- Participants felt that more personal investment in the facilities for which they served as spokesmen would have increased the need for hard negotiating techniques.
- It was difficult for participants to get beyond the specific issue of joint replacement to focus on other higher-level learning goals, such as negotiation.
- Having more in the way of group consequences or rewards tied to the outcome would make the exercise more challenging.
- Participants felt they needed to receive the course data in advance in order to be able to do adequate advanced preparation.
- The task would be more challenging if the teams were given a more drastic charge from the hospital network director, e.g., a 15% budget cut.
- COSs must learn to balance what is good for the hospital network with what is good for their own facilities.
- Groups might have benefited from the formal appointment of a chair, but none did this.
- Leadership from the hospital network director can make a dramatic difference in how a participant thinks about the hospital network.
- Decisions are be based on sound data, not on satisfying the loudest advocate.

Initially designers wanted to conduct reflection sessions after major milestones in the simulation to allow learners to process and understand the big picture of what they were experiencing. But because participants did not have facilitated reflection sessions, but rather a larger debrief between learners and designers at the end of the Live GBS, learners expressed their frustrations with the simulation. Some aspects of the simulation that were sources of frustration for the learners were in fact deliberately designed into the Live GBS, because they were authentic issues designers wanted the learners to contend with that were indicative of what they would experience on the job. Because there was no venue during the simulation in which these issues could be raised by the learners and addressed by course operators and designers, what could have been

opportunities for learning points during the course were lost. At the conclusion of this discussion, the team dynamics coach posed a number of questions for the participants to consider. Unfortunately, the schedule did not permit an in-depth discussion of participants' answers to these questions.

As a wrap-up, the participants were asked to enumerate the things they learned that they could take back to their jobs. Responses included:

- The nature of leadership makes a big difference to outcome;
- Getting people away from their daily routine and putting them together in a room leads to more effective decision-making;
- Meetings are be structured so that people come to the table with sound, hard data, not opinions;
- When confronting these issues, teams look for the larger view rather than jumping to obvious solutions; and
- A certain amount of conflict is good. It helps a team to arrive at a creative solution.

Step 7b: Develop the Roles and Foci of Role Players, Mentors, and Coaches

The success of this training depended on the strength and realism of the scenario. This particular simulation required the participation of a number of agency personnel. The roles and responsibilities of key players in the simulation are described below:

Role players. The Live GBS was to be run with two full-time role players: a hospital network director and a hospital network chief operating officer. The hospital network director's role was to present the case and instructions to the Network Planning Board, to monitor each planning board's progress in all phases of consolidation planning, to check in with the groups to assess

whether they were accomplishing tasks appropriately, and to redirect COSs as necessary. For instance, should the hospital network director notice a lack of effort to benchmark a service against other facilities, both within and outside the agency, the director noted the failure explicitly, so the COSs would remember to benchmark it in the future. At the actual run of the pilot course, however, there were two logistical concerns with respect to the full-time role players:

1. Given that there were three working groups of five and only one role player in each role, access to the role players had been somewhat more limited than might be optimal given the time constraints of the course.
2. Ideally, the person playing the hospital network director is a current hospital network director who is currently wrestling with the very issues of consolidation that the COSs are being asked to address themselves. In courses for other clients, that interaction between learners and authentic role players was one of the significant values of the course, and this value was somewhat diminished bynot having a current hospital network director. However, this was not possible for the first run because the hospital network directors were concurrently having their own meeting on the opposite coast. The agency was urged to consider this issue when scheduling and staffing future implementations of the course.

In addition to the full-time role players, designers wanted to enlist agency personnel, who were present to play small parts as stakeholders in the various medical centers. For example, someone played the head of a local government agency organization and contacted a COS to express concerns with respect to service consolidation. However, not all stakeholders could have been represented by role players. To give the participants a more uniform experience, letters or memos (e.g., from deans of affiliated medical schools) were the primary method of raising stakeholder issues.

Coaches. Coaches met with participants regularly to provide one-on-one and group feedback, based on direct observation of team meetings and on information gleaned from informal status briefings delivered from team members to the coaches.

The course had three coaches to support the three groups of participants: The first coach was a corporate psychologist who floated from team-to-team focusing on the human skills applicable to the service consolidation task, including team building, collaboration, negotiation, conflict management, and communication.

There was also a floating analysis coach, played by an experienced COS renown for his analytic expertise, who assisted the teams with the skills of fact-based analysis, including evaluation of quantitative and qualitative data, identifying relevant data, benchmarking, and fact-based decision making.

Finally, there was a floating hospital network strategy coach, also played in role by the chief operating officer, who focused on guiding teams towards addressing the vision and concerns of the evolving GHA hospital network structure. Skills she focused on included network thinking and broader competitive thinking in the changing global healthcare environment.

Mentors. There were three program mentors, one per team, spending the first day with each team. These mentors were experienced COSs who provided assistance to the trainees as they completed the simulation activities. They offered support in a number of ways, including helping trainees identify appropriate and applicable data, data interpretation techniques, and conflict management.

In addition to the mentors and coaches, designers planned to have one or two data experts available for the first implementation of the course to assist in fulfilling reasonable but unanticipated data requests made by the teams. Unfortunately designers were unable to secure a data expert. However, the chief operating officer of the Minneapolis hospital network allowed them to use her as the on-site data expert.

Step 7c: Design and Prepare the Behind-the-Scenes Strategy Area

The course operators had numerous roles. The group was comprised of both course designers and experienced agency members, who were in charge of distributing data upon request from the COSs, scheduling meetings with the hospital network director, and representing various stakeholders who interrupted the consolidation planning process with political agendas. The latter was achieved through memos and phone calls to specific COSs on each planning board.

Taking a suggestion by the Minneapolis hospital network director, each working group began deliberation with no additional data. Designers hoped that during the initial period each group would come to some qualitative understanding of the problem and realize that data is required to reach a fact-based decision. When groups made data requests via handwritten notes, operators did their best to fulfill them, using either sanitized actual data obtained during course development or fictional data made up in collaboration with an agency data expert on site. In many cases, however, the requested data was simply unavailable, as in the real world. If groups were not asking for appropriate data after a few hours, the role players and coaches urged them (nondirectively) to do so. Finally, in the middle of the afternoon, the hospital network chief operating officer provided each group with the matrix of data, saying that the hospital network's data people worked all morning to pull together the relevant information for the working group.

This ensured that every group went into its final decision-making session in possession of an adequate amount of relevant data.

Step 7d: Create a Realistic Physical Environment to Maximize the Authenticity of the Simulation

The COS Institute training took place in a hotel, an inauthentic environment. Two of the three teams had to meet in hotel rooms because there was no other conference at the same hotel and there were no adequate meeting rooms available to all three teams.

Step 7e: Use Technological Resources to Aid the Flow of the Simulation

Technology was not a factor in running this Live GBS. Data requests were made on handwritten notes that one of the course operators picked up from each of the team rooms at regular intervals. Final presentations were given from standing flip charts. Only one of the 15 COSs brought a laptop with him, but it was used to takes notes that would later be transferred by hand to the flip charts. Designers planned to introduce the stakeholder issues to learners via voice-mail phone messages left in their hotel rooms so the COSs could hear the concern in the stakeholders' voices. The hotel phone system did not have a voice-message system, so written memoranda from the stakeholders outlining their concerns were delivered to COSs halfway through the first day.

Step 7f: Create the Textual Resources Such as Background Information on the Fictional Client and the Project

Each learner, role player, and coach received a briefing packet prior to the beginning of the course. Learners received a summary description (similar to what a medical center might

disseminate for public relations purposes) of the general characteristics and demographics of their fictional medical center and of the other medical centers in the hospital network. They also received incomplete information about orthopedics at the medical center in general, and political issues surrounding consolidation of joint replacement from the viewpoint of its stakeholders. In addition, the analysis coach received the matrix of data provided to learners during the course of the simulation.

The following section provides a brief summary of the Live GBS courses discussed in this chapter, addressing the learners' targeted learning goals, missions, and strengths and weaknesses in each course.

Summary of Three Live GBS Courses

PB1 was a Live GBS course from which the expert design process was articulated. The learners were business consultants with various levels of experience. Some of the learning goals were project-specific and related to BPR, whereas others were knowledge and skills related to the general practice of business consulting, such as data analysis and soft skills involving team dynamics, interviewing, and making formal presentations.

A couple of design features that went well were the model case on which the scenario was based and the role players. The model case was highlighted because as the narrative was formed, it became clear that there would be plenty of authentic opportunities for the learners to practice the target learning goals. In addition, the plethora of documentation from the case made it possible to replicate memoranda, meeting minutes, and analyses. This allowed the design team the

flexibility to choose how data rich and complex they wanted to make the scenario as well as how deeply learners could explore issues they came across as they worked through the scenario.

Some design factors that needed improvement included fine tuning the learning goals and communication skills coaching. The learning goals for the novice consultants were more specific than for principals and partners. In subsequent iterations of the course, broad learning goals such as team building and project management were redefined with a finer granularity to offer more specificity. Another change in future implementations of PB1 was in the coaching. The development partners at Millennium concluded that the person hired as the communications coach was not adding as much value to the course as they had hoped. This led them to reconsider having a communications coach from their staff for the Live GBS course.

PB2 demonstrated that even though the design process did not map directly onto the expert design process articulated from the design of the PB1 course, it could still work. The cross-functional design team relied less on the design architects because the development partners from Millennium Consulting were familiar with Live GBS design from their experience constructing PB1. Design architects were used primarily as advisors rather than active designers after the first six steps of the design. Several years after creating PB2, Live GBSs were still being constructed with positive results, with the original development partners acting as design architects.

In PB2, the interpersonal-communications and team-dynamics coaches roles did not exist. Instead the team mentors, who were experienced consultants heading each team of learners, took on the responsibility of coaching their teams in these areas. This worked out well because the

team mentors were present during most of the team meetings and could provide timely advice to learners.

In the fourth step of this course's design, the scenario was not based on an individual case or project. No individual preexisting project had examples of each of the six project types the course was to simulate. To serve as a model for the scenario, the design team created a model case that contained six different project types from actual cases, which were then incorporated into one narrative. From this, the overarching storyline was invented. This was successful for creating a scenario that met targeted learning goals, although some amount of depth can be compromised by teaching several types of projects within a limited time frame.

The GHA COS course was designed to teach new hospital COSs skills for negotiation and data analysis. Their mission was to work with the other COSs on their team to create a plan that reduced the fictional hospital network's budget. In the process they were to collaborate and create solutions that included consolidating their joint-replacement programs. Overall, the GHA COS course was not as successful as the consulting courses. Although the participants indicated that they valued practicing negotiation skills with their colleagues, other factors proved to be problematic. First, there was not enough information in the actual hospital networks used as data resources to allow the design team to recreate the data analysis learners would need to produce. The physical environment was a negative factor as the hotel rooms serving as team workspaces were uncomfortable to work in and the lack of phone and computer services inhibited the data-gathering process.

In addition, there was not a reflection session at the end of the first day. One of the reasons this would have been a helpful activity was to resolve the issue of the lack of data in the course and

explain that this was not a design flaw, but was deliberately included in the course design to reflect the real lack of data in the hospital network. The reflection session was meant to be a bridge between the Live GBS course and the real world. Not having a chance to resolve lingering issues contributed to the continued frustration of the learners.

The next chapter will extract from these three cases of Live GBS designs a set of principles to inform future designs. The following chapter is meant not only to codify a set of principles, but also to serve as a guideline to inform, smooth, and correct the design process when necessary. This is not a definitive set because it is derived from the designs and implementations of three simulations and every instantiation of the design process will diverge from the critical path at some point. The goal here is to unearth important principles that can be applied to the overall design of Live GBSs.

CHAPTER 5:

DESIGN PRINCIPLES TO APPLY TO THE LIVE GBS METHODOLOGY

After interviews with Live GBS designers, coaches, mentors, role players, and participants in the two Live GBS simulations for Millennium Consulting Partners and for the GHA, a set of design principles emerged that can be applied to the seven primary steps of the design process. Each step in the design methodology has corresponding design principles. In building a course, these principles integrate lessons learned from Live GBS design and can be used in designs of future Live GBSs. Nineteen design principles will be introduced and discussed in this chapter. Other principles may emerge from future designs and implementations of Live GBSs. The stories and examples illustrating the following principles are gathered from the Live GBS designs discussed in the previous chapter.

Summarized List of Live GBS Design Principles

Step 1: Form a Cross-Functional Design Team Consisting of Instructional Designers and Subject-Matter Experts

Principle 1: The design team should include design architects and development partners from the client for whom the Live GBS is being constructed, working closely together throughout the process of creating a Live GBS course.

Principle 2: The design team needs access to incorporate two types of content experts, those who are well versed in the general tasks the learners will be practicing in the course, and content

experts with a specific knowledge and understanding of events, circumstances, and nuances of the model case on which the course content is based.

Principle 3: The design team needs complete access to data from the model case. If the client cannot reveal information that may link the case to the source of the model case, then the design team can use the general storyline or narrative of the case to serve as a guideline, and fictionalize the company information and data for the course.

Principle 4: The model case must include sufficient numbers of challenging situations to provide opportunities for the learner to practice targeted learning goals. If the model case does not contain enough issues to address all of the learning goals or lacks material for a data-rich learning environment, then a hybrid case can be made from an amalgamation of cases that contain appropriate issues and supporting data.

Step 2: Define the Learning Goals of the Live GBS Course by Identifying Skills and Domain Knowledge Participants Will Need to Learn

Principle 5: Each learning goal, be it a skill or domain knowledge, needs to be clearly linked to a task that allows the learner to use the target goal in order to accomplish the task.

Principle 6: Teaching points should be linked to mistakes. Learners need to be able to safely make common mistakes as they work through the scenario.

Principle 7: The problem-solving experience designers are planning should involve challenging situations learners would encounter and should be able to support believable tasks that they would ordinarily practice in the real world.

Principle 8: The design must include *how* and *why* people make mistakes in addition to *what*. In order to get at the how and why, designers must walk through the process in great detail, and plan for every foreseeable contingency.

Step 3: Identify a Typical Case with Opportunities for Learners to Practice the Learning Goals to Serve as a Model Case from which the Live GBS Simulation Is Designed

Principle 9: Although the case is representative of the work the learners will be doing, it should include elements that give the learner a complex problem to solve as well as enough data to support the problem-solving process.

Principle 10: Incorporating too many learning goals may hinder the degree of depth to which learners can learn skills or explore the domain. The case or project that the scenario is modeled after should encompass as many of the targeted learning goals as can be learned to an appropriate degree of breadth and depth. This may change as the course development progresses and issues or tasks prove to be more or less than the learners can handle in the scenario. The design architects and client development partners should work together to strike the right balance.

Step 4: Distill a Narrative of Events from Documents and Events of the Model Case

Principle 11: The narrative should contain enough detail and data to enable learners to uncover relevant teaching points from the case as they work their way through the scenario.

Step 5: Create a Fictional Storyline with Events and Characters from the Narrative to Serve as the Foundation of the Scenario

Principle 12: The actors used as role players must, in real life, be as close to the role that they are portraying as possible in order to bring their experience to the role and use it in the feedback they give the participants.

Principle 13: Ideally, there should be complex issues for the learner to uncover and work through with multiple perspectives on a given issue and more than one entrance path into it.

Step 6: Identify Issues From the Model Case That Can Be Mapped to Learning Goals

Principle 14: The structure of the course has to be malleable enough to allow for teaching point adjustments based on the changing needs of the audience. Direct observations of role players, coaches, and mentors help the team to understand what adjustments need to be made.

Principle 15: The physical environment for the scenario should facilitate data gathering and provide all of the facilities of the working environment being simulated.

Step 7: Build an Infrastructure to Support the Implementation of the Scenario

Principle 16: In designing culminating activities, activities should provide opportunities to fail safely.

Principle 17: Daily reflection sessions should be a nonnegotiable element of the course schedule. Reflection periods are critical to the success of the course as learners are likely to have questions, frustrations, and epiphanies and need help to understand what was presented in the course.

Principle 18: The flow from one activity in the scenario to another should reflect the pattern of the critical path logically, with the following question in mind: How do learners get the information they need in order to produce the answer or deliverable they are working on?

Principle 19: Although the design of the simulation's schedule (what activities and events will occur and where in the schedule they are going to happen) is shaped fairly early in the design process, it should be iteratively refined with the problem-solving process, reflecting tasks and milestones that really occur.

Discussion of Live GBS Design Principles

Step 1:Form a Cross-Functional Design Team Consisting of Instructional Designers and Subject-Matter Experts

Principles that emerged from experiences within this step address issues regarding client and project management.

Principle 1: The design team should include design architects and development partners from the client for whom the Live GBS is being constructed, working closely together throughout the process of creating a Live GBS course.

Development partners are client personnel who may also play the role of content experts. The design architects are primarily in the role of experts in both the educational theory on which the course is based and in the process of designing and building a Live GBS.

Content experts need domain and case expertise, if a model case has been previously identified. They also need to have at least a moderate amount of domain expertise so they are aware of the

domain knowledge and skills needed to be practiced by the learners. It is best if they have first-hand experience with skills and knowledge that were used in the model case. One of the hardest questions for anyone on the design team to answer is, "what does it mean to be an expert in this domain?" The novice must be able to become as close to an expert in the domain as the Live GBS simulation allows. To achieve this, the novices need to know what the experts do, how they do it, and why they do it. The content experts need to know this too, because they need to be able to articulate it well enough for the concepts to be woven into the design of the Live GBS.

Design architects act as theory and process experts and do not necessarily need expertise in the design domain, but they do need a basic understanding of GBS theory. They also need to understand the steps in the design methodology of Live GBSs and understand each step's dependencies, in order to be able to guide the content experts through the design process.

Should content experts have a hard time articulating knowledge they possess about the domain or problem-solving process, design architects need to be able to help them extract what they know and make these explicit. Design architects can use this information to guide the process of creating a Live GBS as they, together with content experts, translate domain-expert knowledge into relevant target skills and content knowledge to incorporate into the course design.

In the first Live GBS design, the team was comprised of dedicated content and theory/process experts. The design team was anchored by design architects from the Institute for the Learning Sciences in the role of theory and process experts. The design architects worked very closely with senior management consultants from the firm to gain an understanding of the industry, the learning goals, and the case that provided the best opportunities for learners to learn skills and domain knowledge. They then mapped the skills and knowledge that learners needed, to

appropriate tasks in the case that served as the model for the course. The design architects also worked closely with three Learning Sciences graduate students who were responsible for gathering and creating data and documents to support the simulated case.

Because the Millennium Consulting PB1 course was designed for management consultants, it had experienced management consultants on the design team. The principle content expert on the team was a senior consultant working closely with the design architects, dedicating a major part of his time to overseeing the course content. In addition, two novice consultants served as full-time design team members. These consultants had never actually been on a case before: this was the first project for one and the other had participated peripherally in a case with the firm before being assigned to this design team. They, along with the three Learning Sciences graduate students, were responsible for researching, gathering, and creating data and material for the course.

The team worked well together, and the consultants on the team had fairly easy access to case documents, industry databases, and other consultants who worked on the prototype case. Even though there were relatively few obstacles in the data-gathering process, team members putting the data together were novices, and there were areas for which realistic data had to be created.

Principle 2: The design team needs access to incorporate two types of content experts; those who are well versed in the general tasks the learners will be practicing in the course; and content experts with a specific knowledge and understanding of events, circumstances, and nuances of the model case on which the course content is based.

Each category of content expertise addresses a different granularity of skills and domain knowledge that the design team needs to address and reconcile as they create the course.

The first area of content expertise is basic problem-solving skills. This not only means having an understanding of what skills need to be introduced to learners so they may complete tasks in the problem-solving process, but also knowing when it is appropriate to introduce these tasks and opportunities to practice new skills in the simulation.

The second area of expertise needed is exact tasks and skills that were actually practiced in the model case, as well as specific events and milestones within the case. Domain experts are needed who actually worked on the case to outline the critical problem-solving path and extract tasks and issues that contribute to diagnosing and solving the problem.

Access to these two areas of expertise is best realized when experts in both categories actively participate as dedicated members of the design team. If this is not possible, it would be preferable to have experts in the first category as active members of the design team, because they understand the problem-solving process at hand. Their expertise is critical to finding the right target skills and structuring course activities to ensure that skills in the problem-solving process (such as making diagnoses and recommending courses of action) are being practiced effectively and authentically. They also help to create data and material to support the course. People with expertise or firsthand experience with the model case may not have the best understanding of the optimal approach to the problem-solving process, or how to break down the process into skill sets that can be practiced in authentic tasks. However, they have an understanding of specific actions and events of the problem-solving process they undertook in the case and can share their experiences with the designers when needed.

In the PB1 project, the design architects had no management consulting experience and the novice consultants serving as content experts creating the data had little or no field experience in the domain. Creating realistic data was counterintuitive because the team members responsible for this portion had little experience. The team spoke with senior consultants from the actual case on several occasions for an accurate picture of events in the case and for insight on issues uncovered during the case. They were also shown created and recreated data for their review. This effort was time consuming and inefficient. Although the design team included consultants who were dedicated to the course design, and who had access to case and industry resources to find and create data, it was not enough. The team needed someone who not only had access to the resources and materials needed to recreate the case and create supporting data, but also someone who possessed enough experiential knowledge to understand nuances of the prototype case and the problem-solving process that the learners would undergo in the simulation. To remedy this, after 2 months into the design process a consultant with 2 years of experience was brought onto the team to help create and check data, and to ensure authenticity within the context of the course simulation.

The data-collection process varies depending on the level of access within the source company. When using a real case as the model, the amount of leeway the client has with the source company, on which the case is based, or how well the model case meets the learning goals will determine how the design team produces data and material for the course. The relationship between the client for a Live GBS course and its source, on which the model case is based, dictates how private information on the latter is used. Experiences for building several Live GBSs revealed the following two principles when using and creating complex course material. These were influenced by the amount of flexibility the client has with source information.

Principle 3: The design team needs complete access to data from the model case. If the client cannot reveal information that may link the case to the source of the model case, then the design team can use the general storyline or narrative of the case to serve as a guideline, and fictionalize the company information and data for the course.

It is not uncommon to have extreme restrictions placed on the amount of real client information a case can reveal or allude to. In the cases for consulting firms, client information is usually pretty sensitive and held privately. This places serious constraints on how to build Live GBS courses from these cases. These constraints were applied to two Live GBS courses created for a major consulting firm to teach consultants how to diagnose problems and recommend changes to a client's payroll department. In both courses the designers were able to use the general storyline of the case; however, the client company's name and information were to remain confidential. The first course taught general topics within a company's payroll process, such as data migration and how it might affect an organization. Because the learning goals were to teach learners to use simple data in order to build a general understanding of the payroll process as a whole, designers worked the case into the course in broad strokes to paint a simple context for the learning goals. Fictionalizing the model case was not a problem because many of the details surrounding the storyline were not needed to support much of the data. Fictionalizing a company's data would become problematic if the scenario became too closely tied to events unique and specific to the model case.

In another example, the client of a Live GBS course, designed for the global-orientation program of a major management consulting firm, placed major restrictions on the design team. They did not want to reveal the source company to the learners nor did they want learners to infer the

company or its industry (the chicken industry) from the nature of the information provided through the course. The design team had to fictionalize the company's name and delete sensitive, revealing data such as profit and loss information. However this proved to be problematic because the chicken industry has relatively few players in it and only one of them had been a client of the consulting firm.

To keep the scenario realistic, the designers had to create a company and a series of competitors in an industry very similar to the chicken industry. Their solution was to place the scenario in the pork industry. Using this setting worked fairly well, had it not been for one obstacle: there were no experts in the pork industry designing this course, and there was a massive amount of chicken industry data the team had to convert into pork industry figures. The solution was to come close to pork industry figures by applying a multiplier to much of the original data. In other words, data representing the chicken industry was directly transplanted into data representing the pork industry. Although most of the learners believed the scenario they were working in was indeed the pork industry, some deduced the information was doctored. One student who happened to have a little experience within the chicken industry looked at the figures and commented that the figures and data trends behaved more like chicken-industry figures. This lesson had some influence on the way future course designs were approached and carried out.

Principle 4: The model case must contain sufficient numbers of challenging situations to provide opportunities for the learner to practice targeted learning goals. If the model case does not contain enough issues to address all of the learning goals or lacks material for a data-rich learning environment, then a hybrid case can be made from an amalgamation of cases that contain appropriate issues and supporting data.

If no individual case contains issues that support the learning goals required, then augmenting the model case with issues from other cases will serve, perhaps by combining them minimally, using one model case as the primary case that guides the problem-solving process and only elements of other cases that provide opportunities to practice specific skills that the primary case does not offer. The case the learners work with must be believable so they will take the simulation seriously enough to go through the case as they would in real life. The team needs to avoid creating a hybrid case in which inconsistencies and unreal factors arise as the learners work through the simulation.

The network that formed the case for the GHA COS course was a hybrid of existing hospital networks. This was necessary because none of the existing networks contained all of the elements necessary to support the breadth of issues the course would address. The Minneapolis network of hospitals served as the basic model because it best represented a network that could support consolidation issues. It had a reasonable geographical and political makeup but was missing elements needed to support complex issues such as competition between hospitals for patients and negotiation with stakeholders. These features were pulled from hospitals in other existing networks and placed into some of the course's hospitals to leverage their bargaining positions.

The GHA COS Institute course design was based on a case created from an amalgamation of hospital networks. The course was set around two fictional GHA hospital networks. Each network had a few hospitals in it and each hospital was headed by a COS. The team was presented with the task of creating a simulation based on a situation in which teams of COSs in training would have a common goal—saving money by consolidating joint-replacement services.

Each COS also harbored a special interest they wanted to protect such as one of the services a hospital provides. Examples are that a local disability organization is threatening action if the hospital closes the joint-replacement section, or the nurses' union promises to strike if the patient load increases without appropriately compensating the staff for the added burden.

Because one of the real hospital networks had many of the physical and political characteristics needed, it became the basic model for the larger network in the Live GBS course. However this network did not have all of the attributes that would necessitate all of the potential issues and crises delineated for the COS teams to grapple with. They needed to deal with topics the model network did not represent, such as consolidation issues, political issues affecting any administrative move they made, and other problems that could arise from closing a facility. These included rerouting patients to another hospital, and elevating or weakening the positions of the hospitals by adding or removing services from them. The design of the fictional network conjoined an assortment of GHA hospitals from various networks in the country. Hospitals were modeled on those that were successful in their community at large, as well as those that were relatively small but with significant impact for other stakeholders, such as the disabled people they served. Stories from COSs and GHA administrators were incorporated into the simulation as issues the new COSs could encounter as a result of a typical mistake new COSs make. These stories included making administrative decisions before taking into account the viewpoints of important stakeholders like hospital staff, the local disabled organization, or the patient who would have no feasible means of receiving treatment if the joint-replacement service in his hospital were to close down. The fictional network, although it was largely based on one network, was comprised of hospitals that met a myriad of characteristics.

The overall lesson from the simulations is that the client is significantly responsible for producing any complex course material. When a design team is asked to create data for a course in a domain unfamiliar to the design architects, the client team members who are content experts need to have significant experience on the topic. The content experts have to be familiar enough with the topic to understand the relationships between tasks and be able to map relationships to the analyses and data sources they use.

Step 2: Define the Learning Goals of the Live GBS Course by Identifying Skills and Domain Knowledge Participants Will Need to Learn

The principles gleaned from lessons learned in this step of the methodology involve determining what content needs to be included in the course and how it is to be conveyed to the learners in the course.

Principle 5: Each learning goal, be it a skill or domain knowledge, needs to be clearly linked to a task that allows the learner to use the target goal in order to accomplish the task.

Determining what knowledge needs to be taught can be tricky. One Live GBS design architect, while discussing the importance of keeping the learning goals in scope, explained that speaking English is something people may need to know in order to perform a task, but it is not what needs to be taught.

Rather, one needs to be able to frame the learning goals in terms of what the learners will do and the knowledge they will need to know in order to do these tasks. Being able to enumerate and to identify information should not be a part of the learning goals unless these are actual tasks the learners will undertake in the field (Schank, 1994).

The learning goals for the PB1 course were developed in two stages. First, the team of consultants had to understand the conceptual structure of the model case. In order to do this, they had to understand what typical activities the project team in the model case performed.

In the actual case, the project team delivered recommendations for change based on diagnoses of the current state. For example, the project team's client company, Verisel, sold computers, but the feedback on customer satisfaction indicated, among other things, a need to improve customer service. Recommendations pointed toward ways to streamline their order-processing systems in order to improve efficiency. The team made these recommendations as a response to diagnoses of serious problems in the way orders were quoted to customers, how products were assembled, and how inventory was tracked. These diagnoses were based on data gathered from quantitative analyses of data and reports on the problem areas that the team tapped from Verisel's files and from personnel and customer interviews the project team performed. They also had to deal with client management issues ranging from managing the scope of the project to figuring out how to appropriate the data they thought they would need.

The learners in the Live GBS course had the opportunity to practice formulating and communicating recommendations, making diagnoses, as well as gathering and analyzing data. Because real cases rarely match the ideal, they also practiced dealing with unforeseen challenges, such as client-management issues.

Principle 6: Teaching points should be linked to mistakes. Learners need to be able to safely make common mistakes as they work through the scenario.

Live GBS designers are not necessarily subject-matter experts. To get an idea of what the common misconceptions and mistakes are requires experts. There are two relevant kinds of experts: the experienced practitioner who understands the problem-solving process and has a number of stories about successful and failed attempts; and the novice who has been exposed to the problem-solving process, but because experiences with the process are still relatively few, can better relay the mindset of the inexperienced.

Getting the experts to articulate what they know is hard. Sometimes experts are more helpful in reactive roles rather than proactive ones. It can be easier to react in order to articulate what the process looks like and where mistakes happen. By using examples of a scenario and allowing them time to step through the process, they can shape and reshape it according to their experiences. Using a concrete example to draw out more information helps them make what they implicitly know become explicit. Another way to discern information is through job shadowing: following an experienced practitioner as they work through the problem-solving process. Third, how they taught the topic in the past, working backward from existing material is another concrete way of determining and articulating what was valuable, what was ineffective, and how to make it better.

The GHA course actively looked for and uncovered several misconceptions a novice management consultant or COS would have as they performed their tasks.

The concept of individually run hospitals being integrated into a network of hospitals was relatively new to the COSs in our course. Being a part of a network meant that decisions once made by an individual COS now had to be made jointly with others in the network. With the new changes in operation came a new set of misconceptions that some COSs had and with them, the

common mistakes they would make based on these misconceptions. We found these misconceptions by interviewing experts and job shadowing.

Data that COSs required in order to make decisions was inconsistent and at times unavailable. When designers met with an experienced COS from one of the hospital networks and complained about the difficulty in finding the needed information, he said that it was a universal problem throughout hospital networks. This issue was not an obvious red flag to raise in the preliminary meetings with experienced COSs, but through novice data-gathering attempts, it proved to be a valid expectation failure that COS trainees needed to experience. As a result, opportunities were built into the course in which the COSs would need to collect an assortment of data in order to make informed and unbiased decisions.

Principle 7: The problem-solving experience designers are planning should involve challenging situations learners would encounter and should be able to support believable tasks that they would ordinarily practice in the real world.

The problem-solving process for the consulting courses were fairly easy to sketch (Table 3). In PB1, learners investigated possible problem areas within a fictional company, identified the problems, and recommended solutions to solve them. Once this characterization was made, it provided a skeletal basis for a framework shaping the general course of the simulations. Generally speaking, the learners were first presented with a mission or general problem. Then as teams, they had to devise a plan of how to investigate the general and/or specific causes of the problem in order to make diagnoses. They then conducted their investigations, made initial diagnoses, and investigated further to confirm their diagnoses and test their recommendations.

Table 3: Problem Solving Process for PB1

Management Consulting Problem-Solving Process	**Characterization of the Problem-Solving Process as Activities Learners Performed in PB1**
Define the problem.	In a project in which the client may not have had a clear or compelling definition of the problem, teams try to find explicit objectives: In PB1, teams and team mentors (acting as project managers) brainstormed potential problems based on information they were given in advance.
Develop hypotheses.	Teams started another brainstorming session with potential answers to help frame upcoming activities in which they contacted the client and began to gather data.
Develop a work plan or set of activities.	Teams made explicit what they plan to do and met with the client executives to communicate their plan.
Map current state.	Learners sometimes need to have a fairly explicit understanding about how processes within a given company work. This was accomplished through interviews with clients, walking through a procedure with a client role player, or by analyzing requested documents for the fictional company.
Collect data.	This was also accomplished through interviews with clients, walking through a process with a client role player, or through information found in preexisting documentation.
Analyze data.	Data gathered was analyzed by learners. If necessary, the team mentor or data analysis coach would first model how to perform certain analyses and advise individuals or teams of learners as needed.
Develop potential solutions.	The teams were encouraged to develop and propose a range of potential solutions before deciding on an optimal solution.
Model impact of alternative solutions.	In this activity, teams analyzed the impact of each of their potential solutions to single out one to propose to the client.
Develop logic path for an optimal solution.	Once the teams identified their optimal solutions, they needed to justify the reasons for choosing the solutions by showing the client how they arrived at their conclusions.
Develop an action or implementation plan.	In this activity learners worked in their teams to develop implementation plans for the fictional client. Then each team formally presented their recommendations with a specific set of actions for the client to implement.

Finally, once they solidified their arguments for diagnoses and recommendations with supporting data, they presented their findings to the client.

Principle 8: The design must include how *and* why *people make mistakes in addition to* what*. In order to get at the how and why, designers must walk through the process in great detail, and plan for every foreseeable contingency.*

Once the process was characterized, in PB1, the design team spoke with consultants at the partner level to determine what procedures consultants went through in order to uncover problem areas in a company. Because the process involved brainstorming, data gathering, hypothesizing, diagnoses, and selling the job to the client, something consultants do iteratively, the partners were well-versed in what the process looked like and what would be required of novices when they stepped out into the field. In addition to walking learners through basic procedures involved in the problem-solving process, the partners explained and revealed difficult aspects in uncovering problem areas within a company and common mistakes consultants make in client interviews.

If there is no set critical path or procedure for problem solving, it is helpful to identify actions and issues that contribute toward diagnosing problems and use them to glean a general problem-solving process that can be applied to your model case.

Step 3: Identify a Typical Case with Opportunities for Learners to Practice the Learning Goals to Serve as a Model Case from which the Live GBS Simulation Is Designed

Principle 9: Although the case is representative of the work the learners will be doing, it should include elements that give the learner a complex problem to solve as well as enough data to support the problem-solving process.

Ideally, there will be some surprises or complex issues that the learners uncover as they work through the case. As learners develop a problem-solving methodology to help guide them through issues the case presents, atypical elements can add complexity, interest, and motivation through expectation failures that result from encountering issues that deviate from the problem-solving script. Work in the real world does not always follow the same script. It entails recognizing and working through problems with complex issues; this is reflected in Live GBSs as well.

As the team designed Millennium Consulting's PB1 they discovered that, in addition to executing steps from a textbook approach to solving a case, the project team also faced the following unforeseen challenges in the case:

Verisel, the fictional client, had a cumbersome and difficult two-headed organizational structure in which the CEO and president were both active and opinionated;

Getting Verisel executives to understand that their order-management process was broken took 6 weeks;

Verisel executives wanted to unsuitably broaden the scope of the project;

Verisel executives were frustrated with the rate of progress early in the project;

Some executives and other personnel were resistant to the whole reengineering effort;

Some data were difficult to obtain from the Information Systems (IS) department;

Some of the problems gleaned from interviews were later proven to be overstated; and

It was difficult to get the client to think creatively about major changes in the process.

It was important to include these elements in the course. However, because the course was a condensed version of a business engagement it was only be possible to incorporate a carefully selected group of these issues. The two-headed organizational structure proved difficult, as when obtaining IS data, and some reform-resistant personnel added enough complexity to the course without diverting learners' focus from the task at hand.

Principle 10: Incorporating too many learning goals may hinder the degree of depth to which learners can learn skills or explore the domain. The case or project that the scenario is modeled after should encompass as many of the targeted learning goals as can be learned to an appropriate degree of breadth and depth. This may change as the course development progresses and issues or tasks prove to be more or less than the learners can handle in the scenario. The design architects and client development partners should work together to strike the right balance.

Case studies are known to be excellent teaching tools through which to engage learners in the learning process. One of the problems that instructional designers face is selecting the right type of case to model. There have been many books and magazine articles written on what is the "best type" of case study. Although there may not be a definitive case that is the best for any given Live GBS, the design process can support the creation of an amalgamation of common cases that together contain enough elements to support teaching the targeted learning goals.

The best example of a prototype case from which to model a scenario for Live GBS courses is the model case for Millennium Consulting's Practice Basics courses. In PB1 the team was able to

develop a course from a case containing activities and milestones onto which one could easily map learning points. This was possible because the model case was structured like typical consulting engagements and contained a wealth of quantitative and interview data.

Step 4: Distill a Narrative of Events from Documents and Events of the Model Case

In PB1 a narrative of events was distilled from the documentation of a prototype case. The main point in creating a narrative of the case is to draw a distinct outline of the problem-solving process the course will be simulating. Events and milestones that take place along the way, such as meetings with key client executives and informal presentations, affect the process. These events need to be included as integral parts of the process, not only as points around which tasks are performed, but also as goals for the learners to reach. And because these are real elements from the model case that acted as points of tension for those consultants, these elements have to be present in the Live GBS simulation in order to make it "feel" real.

Principle 11: The narrative should contain enough details and data to enable the learners to enable learners to uncover relevant teaching points from the case as they work their way through the scenario.

The model case is likely to have enough data, stories, and events in it to support many of the targeted teaching points. However, there are likely a few teaching points that need to be included in the course, but are not represented or supported in the model case. In order to build a bridge from the case to the total picture necessitates adding details to the case story (such as an element of political conflict among the client's top executive officers). To do this, one can create new data or change existing data to support a topic the learners encounter (such as a customer service

survey and results to indicate customer dissatisfaction with the client), or one can insert events into the course (such as scheduling "check point" meetings and impromptu presentations with learners and role players in order to give the learners opportunities to practice soft skills, such as presenting an articulate and sound justification for their hypotheses and progress).

Step 5: Create a Fictional Storyline with Events and Characters from the Narrative to Serve as the Foundation of the Scenario

Principle 12: The actors used as role players must, in real life, be as close to the role that they are portraying as possible in order to bring their experience to the role and use it in the feedback they give the participants.

During the pilot run of the PB2 course, one of the teams had a meeting with the client CEO (a role player) to interview him about how to reconfigure the sales-automation process. The team asked him a series of questions including some referring to financial issues. The CEO recommended they ask the CFO for those answers. The lead interviewer could not believe that a CEO would not know this information and proceeded to lecture him on the fiduciary responsibility he had as CEO of his company. The CEO patiently listened for a short while and then called a halt to the lecture. He fired the team and demanded to speak to the senior executive in charge of the fictional project. The team was visibly shaken by this dramatic reaction. Then the CEO stepped out of role and spoke to them. In real life this role player was a CEO with years of experience running a successful company and working closely with management consulting firms as their client. He told the group this and explained that his reaction was very real. He felt that the team was behaving disrespectfully to their client and would be fired in real life. In addition, the CEO of Millennium Consulting would likely be called in to repair the relationship,

and the team would probably be recomposed—and, at the very least, the lead interviewer would not be allowed back on the project.

The fact that the role player was in reality very similar to the character he was portraying helped enforce the impromptu lesson he imparted to the team, so that it made a strong impact on the learners.

Step 6: Identify Issues From the Model Case That Can Be Mapped to Learning Goals

Principle 13: Ideally, there should be complex issues for the learner to uncover and work through with multiple perspectives on a given issue and more than one entrance path into it.

In order to derive the best approaches to solutions, learners are expected to understand multiple perspectives, advantages, and disadvantages of issues.

In the GHA Live GBS course, the teams of COSs were given the task to reduce the network budget by consolidating the joint-replacement services of their hospitals. In doing this, they had to take all of the positive and negative effects of their decisions into consideration. The COSs needed to be introduced to the idea of viewing this particular issue from the multiple perspectives of the various organizations and groups who are affected by decisions the COS makes regarding service consolidation. In considering implications of their decisions, the learners were encouraged to ask themselves what the effects are of consolidating a joint-replacement program in a facility. COSs need to look at this decision from a number of angles: financial, logistical, and political. Financially, this made sense because the network as a whole would be saving the cost of maintaining and operating human joint-replacement services. Logistically, the hospital that would be taking on more patients as a result of another hospital

losing this service could negatively affect the staff's workload, patients' accessibility to care, and the quality of patient care from an overburdened surgical and nursing staff. Politically, the teams had to face the possibility of ramifications from the affected hospitals' stakeholders, such as a local disability organization concerned about patient care issues, the nurses' union trying to protect its members from an overworked and understaffed environment, and hospital board members concerned with losing prestige within the community and with their status as a teaching facility, if it loses any fraction of its joint-replacement service.

These are only a few of the possible perspectives one issue can unearth. The challenge is to find these perspectives and build ways for the learners to encounter them and integrate them into the course. The designers invented representatives who would communicate to the team members by email, voicemail (although the location of the Live GBS course could not support this), and paper-based communication.

The challenge for Live GBS designers here was to give them exposure to as many different perspectives as possible. In this way the learners got an idea of the breadth of understanding they must have when they make decisions in the field, yet were not bombarded with too many different avenues that might cause them to digress from the critical path of the Live GBS.

Principle 14: The structure of the course has to be malleable enough to allow for teaching point adjustments based on the changing needs of the audience. Direct observations of role players, coaches, and mentors help the team to understand what adjustments need to be made.

After several runs of the PB1 Live GBS, designers at Millennium Consulting began to fine-tune the course to make it operate more efficiently. One of the ways they made changes was by

adding a dynamic element to the course. The Live GBS course typically handles at least three teams of seven learners. In the first several implementations the course was able to individualize some of the lessons the teams learned by allowing role players the freedom to use their own experiences as business executives to help them react appropriately as they interacted with the teams, through interviews, meetings, and presentations.

Partnering designers at Millennium Consulting decided to combine the mentor and coach roles into one. In that way, the experienced consultant heading a team was not only the mentor, but also the team dynamics and analytic coach. The extended role of the mentor/coach allowed them to further use their expertise as practiced consultants. The coaches were able to direct the course toward their respective teams by feeding inside information to the course operators behind the scenes. For example, one of the teams was not working toward reaching a hypothesis, with the attention and urgency that the course or a real case required. The coach noted this and, during one of the breaks, went to the separate strategy area where the course operators and role players were stationed. She commented on her team's lukewarm approach to the tasks and, together with the course operators and role players, thought of how to make them less passive in their approach. They decided that when the team met again after the break, the coach would receive a fake page or telephone call forcing her to excuse herself from the room. After a few minutes the CEO role-player would "drop by" the team's working room for an impromptu 2-minute progress report. The CEO would ask them what they had done, what hypotheses they were discussing at the moment, and other questions designed to gauge the seriousness with which they were approaching their work. In this case, their answers indicated that they needed to accomplish more at that point in the simulation. The team as a whole felt this too and, deciding that they needed more preparation, both renewed and increased their data-gathering efforts.

Principle 15: The physical environment for the scenario should facilitate data gathering and provide all of the facilities of the working environment being simulated.

The setting for the GHA COS Live GBS course was far from authentic. To begin with, it took place in a hotel as opposed to an office setting with only a fraction of the amenities an average office space would contain. Overall the environment was uncomfortable and did not accommodate real methods for the teams to gather data. The teams met in hotel guest rooms and gathered around coffee tables. They communicated with the "office staff" (i.e., support staff working behind the scenes to obtain and disseminate information to the teams) via handwritten notes that were picked up on an hourly basis. This combination of an uncomfortable and inauthentic physical environment and slow response times to their questions contributed to the participants' overall frustrations with the course and lack of suspension of belief during the simulation.

Step 7: Build an Infrastructure to Support the Implementation of the Scenario

In this step, the structure of the course should begin to take shape beginning with designing culminating activities focused on specific skill sets and building reflection periods into the course framework.

Principle 16: In designing culminating activities, activities should provide opportunities to fail safely.

Both learning in the context of performing tasks toward a meaningful goal and failure-driven learning are central to the design of a Live GBS. The tasks or activities in which a novice will

participate in a Live GBS simulation have to mirror the tasks they will perform in actual practice. The following example explains why a specific activity in the Live GBS schedule was included.

The example illustrating Principle 12 described an interview fiasco with a CEO role player who nearly fired the team as a result of their behavior. There was a legitimate reason for having an interview with the CEO at that point in the Live GBS. In a typical consulting engagement the team of consultants will meet with the CEO of their client after a few weeks of brainstorming, data gathering, and coming up with some tentative findings and hypotheses. This is a relatively informal interview with the CEO, but an important one to have preceding any formal presentation of findings and diagnostic hypotheses. This is important because the team ultimately needs to impress and convince the CEO in order to sell their services. To do this they need to have a less formal meeting with him in order to get a sense of what his sensitive issues are—that is, they need to find out what issues are most important to him and what would otherwise be a waste of their time. The learners must succinctly and clearly communicate their progress, hypotheses, and intended next steps to the CEO. The CEO in turn provides feedback: at times his comments can seem impulsive or cryptic, depending on how the specific role player chooses to play the part. The team uses the remainder of the meeting to get a better understanding of what direction the project is headed.

Because we learn through the mistakes we make in the context of performing real tasks, having the Live GBS participants perform real tasks in a simulated engagement also means giving them the opportunity to fail and to learn by failing in these tasks. One participant from one of the Millennium Consulting Practice Basics Live GBSs wrote:

> Scott's [a partner-level consultant as role player] comments were on the money. I had some time to contemplate on his feedback while I sat on the runway at O'Hare for nearly 2 hours. I did wonder why that might have been the case. The only answers that I could come up with were: we got carried away with the good job we had done, and forgot all about the client, or maybe the fact that [after each final presentation] the CEO, CFO, and the partners stepped out of their roles when they gave feedback to the other groups, may have made us forget that this was meant to be a real life experience …. No matter what the reasons, it was good that we went through something like this because I am unlikely to forget the lessons learned for a long time … after all the client does not care about the reasons either. —"S"

Although failure provides valuable learning experiences, the Live GBS is designed as a safe environment for the learners to fail in. However, if learners feel threatened by the activities it could adversely affect their performance.

The final presentations of the first Practice Basics Live GBS course took place in front of the role players and actual officers from the consulting firm, including the CEO. In theory designers thought this would be beneficial to the learners, because the feedback from very senior, experienced consultants would be extremely valuable in a forum. Top-level consultants rarely advise novices in the field, and designers wanted to take advantage of this situation.

Although there was a level of safety, because the novices were working on a fictional case, this situation also presented the dilemma of knowing that failing in this setting could have drawbacks. The environment was authentic, the role players were convincing, and the case was data rich, complex, and believable. This contributed greatly to the learners' suspension of belief.

They worked as hard on this fictional case as they would in the field, and their successes and lessons learned through failure were certain to leave a memorable impression on them. From a learning standpoint, that was the desired effect.

The crux of the dilemma lay in risking the possibility of the learners hurting the impression they are trying making with their superiors. Even though this Live GBS is a training course and errors are expected, the learners do not want to seem less competent in front of their superiors. This was not a problem during the week when the teams were working together with experienced consultants heading their teams. This became a problem when the learners carried out their final selling presentation in front of their real bosses—the executive officers of the firm—as well as the mentoring consultants, coaches, and role players. The added pressure of having the CEO of the consulting firm there during the final presentations put too much pressure to perform on some participants and made them feel too nervous to do as well as they felt they could if the firm's executives were not present.

Another outcome of having the CEO there during the final presentations was that he could get a glimpse of the level of experience his company's newly hired consultants actually had. After seeing how some participants chose to analyze the data they were given and how they communicated this information to clients, the CEO realized that his new hires were less experienced than he expected. Although the participants in the Live GBS were novices, he was nevertheless concerned with the overall quality of the presentations. This reinforced his belief that training such as the Live GBS adds value and is needed in his organization to give consultants authentic practice before stepping into a client company.

Principle 17: Daily reflection sessions should be a nonnegotiable element of the course schedule. Reflection periods are critical to the success of the course as learners are likely to have questions, frustrations, and epiphanies and need help to understand what was presented in the course.

Reflection periods are critical to the success of the course as learners are likely to have questions, frustrations, epiphanies and visceral experiences in the course that need to be shared with other learners in the course. These sessions should be facilitated by at least one person who is well versed in the domain and skills the learners are practicing.

Because the Live GBS simulation was running overtime, the design team skipped the reflection sessions in the GHA course and regretted it. COSs needed to step back and talk about the significance of what they went through the first day. One of their frustrations was with the lack of data available. After the Live GBS simulation was over the learners filled out a survey evaluating their experience in the Live GBS, after which, they, the mentors, and designers met for a post-course debriefing. This was the opportunity for everyone to discuss what happened in the simulation. In the surveys, some participants wrote that they felt the data gathering and analysis aspects were unrealistic.

If reflection sessions had been conducted during the simulation, they could have prevented frustration by helping learners understand that the lack of data and the channels they had to go through in order to obtain data was modeled after what data would actually be available to them in reality, and the channels they themselves would ordinarily pursue when they searched for information. But they did not know any of this until after the course was over. During the debriefing session discussion they learned that the lack of data and methods for obtaining data

were not only authentic, but were intentionally presented this way because this was a real issue that COSs have to deal with. They did, however, have more data than they would normally have access to in their real jobs. Because there was no reflection session, there was no forum through which they could extract lessons of the day and discuss them with each other and with the three experienced COSs who would have been present at the session. The learners did not come to realize this particular lesson until after the course was over, and did not experience the reality of it until they actually began work as COSs in the new GHA hospital networks.

Principle 18: The flow from one activity in the scenario to another should reflect the pattern of the critical path logically with the following question in mind: How do learners get the information they need in order to produce the answer or deliverable they are working on?

A lot of problem areas within an organization are best discovered through talking with the people that work there. The designers for PB1, for example, understood that interviewing clients was a critical data-gathering skill that consultants use constantly. So the question of how learners would get the information they needed was answered by simulating the context in which consultants from the example case interviewed client personnel. The design team needed to know how they figured out who to interview, how they accessed the people they interviewed, what categories of information they discussed, what general themes could be extracted from the compilation of interviews, and how they accessed other information.

Designers for the PB1 Live GBS interviewed experienced consultants within the firm to understand how the data-gathering process begins during a project. It became clear that the client sponsor, the high-level client executive responsible for hiring the consultants, was the typical starting point to provide names of a few personnel to talk with and what their areas of expertise

are or where their interests lie. However, the client sponsor may have an agenda of his own and might point the consultants towards people that share his views. It is up to the team of consultants to cut through this during the course of interviews to find out what the major areas of concern are within the company, what perspectives surround these issues, who supports them and why, who is opposed to them and why, and what hard evidence (reports, surveys, and figures) exists that consultants can analyze and use to build an argument supporting a diagnosis and recommendation.

The design of PB1 reflected what actually happened in the real case. The CEO was the client sponsor. He wanted the team to evaluate the company's strategic plan. After a few initial meetings with him, the CEO revealed that changes were needed to improve the company, as profits were low and the sales force was largely dissatisfied. He encouraged the consultants to talk to sales managers. The team started by collecting public-domain information on the company and interviewing about 40 people, including all of the sales managers, to uncover the problem areas.

Participants in the Live GBS started their investigations in the same manner. They met with the CEO role player once in order to get a general idea of where to begin their investigation. They had to find reports and other sources of data available to the public to arm themselves with as much information about the company as possible. In reality, the consulting firm subscribes to a few databases with financial and statistical information on companies. For the simulation, because Verisel was a fictional company, the participants asked "assistants" (actually scenario operators playing the roles via email) to look in a database for specific information on Verisel. The assistants then gave them fabricated information on Verisel. If the same relevant information

was also available for the real model company, then the designers would mock up the same report or data for Verisel. Although the learners did not get the benefit of searching for themselves, they got a feel for what information is plausible to retrieve within the constraints of the databases.

Participants were given an organizational chart with the names of executives. Because the participants had a limited amount of time in the simulation, they were given access to a client "assistant" who could help them schedule interviews with personnel. Each person the consultants interviewed had a perspective on issues they wanted the team to hear. One lesson participants learned was that client relations really were critical to the success of the project. When the relationship was cordial and non-threatening, the higher-level executives could allow access to lower-level role players, available for communication through email (the scenario operators in the strategy room were playing these characters), with access to some in-house data that would support claims the team wanted to make. As in the real model case, the higher-level executives were not necessarily the keepers of the hard data the consultants needed, but if the client/consultant relationship was non-adversarial, they could point the team toward the right people.

These examples were used in the design of the PB1 Live GBS, because they not only reflected events and situations from the model case, but also addressed some of the target learning goals the designers wanted the learners to experience, such as where to retrieve company information and what is available publicly, or the benefits of building a good relationship with the client.

In the GHA Live GBS, the design team discovered that the data from hospitals that designers used to create this particular course were inconsistent and at times unavailable. An experienced

COS from one of the hospital networks explained that it was a universal problem across GHA hospital networks. This issue was not an obvious red flag to raise in the preliminary meetings with experienced COSs, but proved to be a valid expectation failure that learners needed to experience. That is, the COSs expected data to be more accessible, and in some cases they expected the data to exist, when in fact data is difficult to retrieve and may need to be created in order for COSs to have the information needed to effectively solve the problems they encounter. As a result, COSs needed to collect an assortment of data in order to make informed and unbiased decisions; however, they discovered some data they expected their hospital to have readily available was difficult to access, as it was in reality.

This teaching point would have been more successful if the data-gathering process was more authentic. The resources the participants had were primitive and cumbersome compared to the methods they would use in reality. Instead of having telephone and email access to administrative personnel portrayed by role players with access to data and knowledge of data availability, channels, and data-gathering processes, the COSs had to communicate questions and data requests through paper notes to designers who were not content experts, nor were they versed in the intricacies of the data-gathering process within a GHA hospital network. This was not by design, but from lack of availability of knowledgeable content experts and the limited resources of the physical environment. As a result, this detracted from the authenticity of the simulation, as well as the target learning goal of knowing how to get the data they needed and the expectation-failure-driven point that data they expect to exist in the network often does not exist. Instead, this contributed to the frustrations of the participants.

Principle 19: Although the design of the simulation's schedule (what activities and events will occur and where in the schedule they are going to happen) is shaped fairly early in the design process, it should be iteratively refined with the problem-solving process reflecting tasks and milestones that really occur.

The problem-solving process should ideally mirror the problem-solving process learners would undertake in the real world. The situational pattern of the problem-solving process in the Live GBS is modeled after and maps onto the real-world pattern of tasks. Given this, there are factors that contribute to creating the course that directly address this matter. Two of these are the narrative and issues. Every case or project has a story about what happened and what people did. This is what the narrative discloses. If people performed tasks and activities in the model case that use targeted learning goals, these are the tasks and activities that need to be incorporated into the scenario. Issues are challenges or problems either included in the pattern of typical tasks that learners are expected to undertake in the real world or challenges that people experienced in the model case that add complexity to the scenario and provide opportunities to practice target skills. Issue scripts created by design teams show the entrance path into issues (i.e., how a learner discovers the issues), possible methods of analyzing the problems, and potential solutions learners can derive from the analyses. The following example taken from an issue script from PB1 is a sampling of what an issue script contains. It also serves to provide a glimpse into the problem-solving process by showing how a learner can be guided toward a potential problem that needs solving and what type of analyses makes sense in this situation.

Example: Millennium Consulting PB1 issue scripts and tasks

Issue: Orders are difficult to track

Description

The client uses a variety of isolated systems to track orders—most departments have their own internal system. Hence, it is difficult to get a sense for where orders stand in the system as a whole.

Examples of Entrance Paths to the Issue:

Potential interview questions from learners to role players: What information could other departments provide that would make your job easier to do?

Answer from external salesperson (role player): Sometimes I just need to be able to assure my customers that an order is going to be delivered on time. To do that now, I've got to call three different places to see who's got the order and then make them check on where it stands. Inevitably, they don't know, so they've got to go look it up and then hunt me down later. It's a hassle and when it takes too long it makes me look bad to my customers.

Example Analysis Path to solving issue:

Find out how much time is spent tracking orders:

Method 1: Learner can interview client personnel in the scenario

Example response from an external salesperson (role player):

You know, chasing down orders wasn't part of the job description I was given when I signed up for this job. But, it's part of giving customers good service. I tend not to bother unless it's a rush order or for a new customer. I guess I probably spend a couple of hours every other week or so

on the phone trying to figure out where one of my orders stands and who I need to cajole to get it moving forward.

Example response from internal sales representative (role player):

It's hard to split out how much time I spend doing one thing or another. There's so many different ways I split up my day. But, to take a stab at it, I'd guess that I spend a half an hour a day figuring out where orders stand for a salesperson or a customer.

Method 2: Perform a study:

Perform an internal sales representative work study: Results will show that internal sales representatives spend 7% of their time responding to inquiries about where orders stand.

Potential Recommendations:

Recommendation: Install a fast order-management process.

Justification: Results are in less need of tracking orders if they flow through the system rapidly.

Related coaching from the team mentor: How much does it reduce headcount?

Headcount = % of time on order tracking multiplied by # of people, summed over departments.

The dual purpose of issues in a Live GBS is to give learners a realistic problem or challenge in the scenario that they encounter and have to work their way through, and to provide opportunities to practice target learning goals.

Conclusion

This chapter provided a discussion of how an evolving set of principles emerged from the successes and failures of the three designs and implementations of the Live GBSs described.

After describing three cases of Live GBS course designs in the preceding chapters, and their corresponding principles of design, the question of the success of the ideal design methodology still remains. There is not yet any hard evidence that participating in a Live GBS will result in improvement in general content-free problem-solving skills. Nor is there evidence that Live GBS learners retain knowledge much longer than learners taught conventionally. The following chapter will provide a starting point from which the question of the effectiveness of the Live GBS can be answered.

CHAPTER 6:

POST LIVE GBS SURVEY RESULTS AND CONCLUSION

The question of the perceived effectiveness of this design model largely depends on the comparative success of a Live GBS course in which the ideal methodology is used, to that of a Live GBS course in which the methodology significantly differs from the ideal at one or more steps in the design process.

The results of post-Live GBS surveys from two of the previously discussed Live GBS courses, Millennium Consulting's PB1 course and the GHA COS course are explicated in this chapter. Each followed the same basic design process, but because the latter strayed from the ideal design methodology in some aspects, the overall learning experience for its participants was compromised. The results reflect the success of the design based on how closely each design followed the critical path of the ideal design methodology and adhered to design principles outlined in Chapter 5.

Results from the Post-Live GBS Survey of Practice Basics 1 Participants

Learners' targeted skill levels were not formally evaluated and determined before participating in the simulated project. Their skill levels were generally known to the firm through information gathered during the recruiting and hiring process. Skill levels were, for the most part, homogenous. It was therefore assumed that, with few exceptions, the participants started with analytical skills learned in business school, but not necessarily practiced in management-consulting engagements. No participants had much experience in working on a consulting

project in which they were actively engaged in the problem-solving process, client relations, and presentations typical of actual projects.

Before the simulation began, as they first came together in teams, participants discussed their experience and skill levels with their teammates in order to determine where their strengths lay. This helped uncover candidates for mentoring, and identified which areas they could most benefit from practice within the simulated project.

The design of Millennium Consulting's PB1 course best represents the ideal design structure for a Live GBS. This claim is supported by post-Live GBS survey results taken from course participants. In September 1998, 20 newly hired management consultants participated in Millennium Consulting's PB1 course. These consultants typically arrived at the firm with new Masters of Business Administration degrees and some may have had limited experience in management consulting. In order to ascertain the effectiveness of the Live GBS course in the learners' target skill levels, a survey (Figure 3) was given to the learners approximately 6 months after they participated in the course. The survey consisted of nine questions asking the participants to evaluate and comment on the course's effectiveness in increasing their target skill base and its impact on their work in management consulting projects. Because a typical consulting project takes 6 months to complete from diagnosing problems to recommending solutions, participants in Millennium Consulting's PB1 course were given this survey 6 months after going through the Live GBS simulation.

The following questions were given to the 20 participants of PB1. The results of the survey follow.

1. **Was the course a valuable use of your time? Did it**
   A. Contribute to your individual skill base?
      (Very much) 5 - 4 - 3 - 2 - 1 (Not at all)
   B. Impact the work you do on your engagements?
      (Very much) 5 - 4 - 3 - 2 - 1 (Not at all)
   C. Do you feel the class contributed to you being a better consultant?
      (Very much) 5 - 4 - 3 - 2 - 1 (Not at all)
   Comments:

2. **If we were to offer the course again, would you recommend …**
   A. outsourcing it to a third-party training vendor
   B. keeping it the same
   C. including more case studies, or other ways of adding more Millennium-specific material
   D. not offering it again
   E. other?
   Comments:

3. **To what extent do you agree with the following statements:**
   A. I feel I am able to apply what I learned in class to my client work today
      (Very much) 5 - 4 - 3 - 2 - 1 (Not at all)
   B. I need to be skilled in this subject to do my job
      (Very much) 5 - 4 - 3 - 2 - 1 (Not at all)
   C. I knew a lot about this subject before attending the training
      (Very much) 5 - 4 - 3 - 2 - 1 (Not at all)
   D. The exercises in class helped me learn the material
      (Very much) 5 - 4 - 3 - 2 - 1 (Not at all)
   Comments:

4. **What was the most valuable aspect of the course?**

Figure 3: Post-Live GBS Survey Questions for Practice Basics 1 Participants

Question 1. Was the Course a Valuable Use of Your Time? Did It

A. Contribute to your individual skill base?

(Very much) 5 - 4 - 3 - 2 - 1 (Not at all)

Results:

Value	Rated by % of Participants
5	20%
4	45%
3	30%
2	5%
1	0%

B. Impact the work you do on your engagements?

(Very much) 5 - 4 - 3 - 2 - 1 (Not at all)

Results:

Value	Rated by % of Participants
5	25%
4	40%
3	25%
2	10%
1	0%

C. Do you feel the class contributed to you being a better consultant?

(Very much) 5 - 4 - 3 - 2 - 1 (Not at all)

Results:

Value	Rated by % of Participants
5	35%
4	35%
3	25%
2	5%
1	0%

Overall, 65% of the participants believed the Live GBS contributed to their skill development, and that the Live GBS will impact their work in the field in future projects as well. Seventy percent actually felt their experience in the Live GBS positively affected their ability to be consultants. This not only supports the hypothesis that the Live GBS contributes to their skill base as consultants, but also highlights the perceived benefits of exposure to and interaction between learners, peers, and clients.

Learners' Comments From This Question in the Survey:[2]

Learners' comments from this question reinforce the perception that the Live GBS contributes to their skill base.

Subject 2:

[2] All comments from participants who responded to the PB1 and GHA surveys are included in this chapter.

I really enjoyed the training, especially the live sessions with the [role-play] executives. It's nice to get out of the sterile classroom and experience some fairly realistic situations.

Subject 5:

It was very good from a Millennium centric perspective. Which is what I believed it to be targeted at. As far as basic skills and all for being a consultant in general, the groups we formed were experiences we'd had in school a lot. Consulting in general is much more directed with partner/upper-level management intervention. All in all though it was very useful from the Millennium perspective.

Subject 6:

Considering that I've been on about a dozen prior consulting engagements prior to joining Millennium, the impact that the course had may have been a little different on me than for the rest of my team (with little or no consulting project engagement experience). I feel that it really contributed to my development in the terms of leadership project management and presentation development.

The team interaction also reminded me what it was like to be an incoming, inexperienced consultant … so I hope I was able to pass along some of the things I've learned throughout my brief career so far. It was fun. It also reminded me how important group/team dynamics are (there were a few challenges in our group in terms of personality conflicts). The importance of enjoying the work being done, and the team that you work with is so important … and is reflected in the quality of the output.

Subject 7:

I thought the class was well run and well simulated. You did a great job of making us feel like it was a real client engagement. Having [role players] as executives is very effective.

Subject 9:

The case and service line around which the session is based has not been an area of work in the five inter/external projects I have worked on so far. Now, if I get on a project that overlaps, my responses to the above would be different.

Subject 13:

The 2-week immersion in Millennium ideology is very useful and provides a foundation for developing solutions …

Subject 14:

Good introductory foundation to better understand and begin to adopt the "Millennium way."

Subject 16:

More than anything else, the course allowed me to gain some insight into the interworkings of a Millennium team, and expectations of Millennium team leaders.

Subject 17:

As my first "consulting" experience, Practice Basics truly helped me begin to build my foundation. At times, it was frustrating for me because I didn't understand what I should have been doing/thinking about, and I found myself constantly seeking the advice of those around me.

(not that this is a bad thing, but it's nice to stand on your own two feet …)

Subject 20:

The class was valuable not so much in making me a better consultant, rather assimilating me into the culture of Millennium.

Question 2: If We Were to Offer the Course Again, Would you Recommend …

A. Outsourcing it to a third party training vendor
B. Keeping it the same
C. Including more case studies, or other ways of adding more Millennium-specific material
D. Not offering it again
E. Other?

Results:

Value	Rated by % of Participants
A	0%
B	40%
C	55%
D	0%
E	5%

The participants believed the course was valuable, in that no one recommended that it be outsourced to another vendor or eliminated. However, although a sufficient percentage of participants (40%) felt that the Live GBS should remain as it is, a higher percentage (55%) felt that adding more cases and more Millennium Consulting-specific material would enhance future courses.

Learners' Comments From This Question in the Survey:

Subject 3:

> The course was geared toward people with a consulting background. I know that most of the people coming to Millennium are MBAs or former consultants but some aren't. There is a very steep learning curve for those without prior experience.

Subject 5:

> Again, the same theme. I would stick to a Millennium orientation. It was great, but also it was great to network and get to know the other recruits.

Subject 7:

> The course is very good. Outsourcing it to a 3rd party vendor who does not know Millennium or understand the space and environment that we work in is a little risky.

Subject 9:

> If e-commerce work is what our focus is [in the firm], that should be at the center of the [training] session. My guess is that PIP was an area in which we had a lot of initial jobs (and perhaps still do some) but the direction is more towards [e-commerce] and the session should be recast to align with that.

Subject 12:

> The course was a great introduction to project management. It would have been nice to get a clearer picture of how program management differs from project management. Maybe with an example of how a project is run using basic PM skills and how it is run using program management skills.

Subject 13:

Make cases more interactive early on to provide guidance for Week 2.

Subject 17:

I think it would be interesting to provide the class with reading material (several decks, suggested websites) to get everyone thinking about the case. In cases where you have a less experienced class, it might help to truly lay the business case out and then drive toward a proposal.

Subject 19:

However, the role of the facilitator needs to be better defined for this to be a better learning experience.

Subject 20:

The case study was a useful and valuable exercise, however because Millennium provides more service offerings, I think the course should address the other core offerings, especially Digital Strategy engagements, which seems to differentiate us from other firms.

Subject 21:

The guy did a good job of making it applicable to real life. Having engagement leads insist on this being done would teach PM better than anything else.

Question 3: To What Extent Do You Agree With the Following Statements?

A. I feel I am able to apply what I learned in class to my client work today

(Very much) 5 - 4 - 3 - 2 - 1 (Not at all)

Results:

Value	Rated by % of Participants
5	15%
4	40%
3	40%
2	5%
1	0%

B. I need to be skilled in this subject to do my job

(Very much) 5 - 4 - 3 - 2 - 1 (Not at all)

Results:

Value	Rated by % of Participants
5	30%
4	45%
3	10%
2	15%
1	0%

C. I knew a lot about this subject before attending the training

(Very much) 5 - 4 - 3 - 2 - 1 (Not at all)

Results:

Value	Rated by % of Participants
5	5%
4	40%
3	35%
2	10%
1	10%

D. The exercises in class helped me learn the material

(Very much) 5 - 4 - 3 - 2 - 1 (Not at all)

Results:

Value	Rated by % of Participants
5	25%
4	50%
3	25%
2	5%
1	0%

Seventy-five percent of participants who responded felt that they needed to know the skills taught through the Live GBS in order to be successful in the field. Twenty-five percent were either neutral or negative in their responses. Forty-five percent of participants felt that they knew much of the content and skills before attending the course, which correlates with the average percentage of novice consultants entering the course with some experience with quantitative, business-related analysis. Seventy-five percent felt that the tasks and activities helped them learn the material, although 55% felt that they could apply what they learned in the PB1 Live GBS to their client work. A majority of responses were positive, however, 40% of participants gave neutral responses, which may imply that at that point in their experience as consultants they may not have had sufficient opportunities to practice the skills they learned in the simulation to predict how much of the material learned in the Live GBS will be used in the field.

Learners' Comments From This Question in the Survey:

Subject 2:

> Practice Basics, by its very nature, is the underpinning of everything else that we do. My other B-School classmates seemed a bit envious when we compared each of our basic indoctrinations. Most had rather sterile classroom environments instead of Millennium's interactive simulation.

Subject 5:

> Al in all most classes were good. It's hard to remember everything at this point to be honest, but I remember leaving with a positive spin on the whole affair.

Subject 7:

> I had a similar training exercise at my last job, but what made Millennium's unique was the interaction over email with the employees of Verisel. Further, I thought having the CRE's role playing as executives instead of having the Partners at Millennium do this, added an interesting dimension to the exercise.

Subject 13:

> Make the cases more interactive early on.

Subject 16:

> I feel new hires into the consulting industry can benefit much more than others. However, it was beneficial to gain an understanding of the Millennium tools and methodology.

Question 4: What Was the Most Valuable Aspect of the Course?

When asked to single out the most important aspect of the course, some participants mentioned learning the company's culture and toolsets. Others broadly referred to the "client simulation," which by and large was the whole course including working through actual tasks expected of consultants at their level (but excluding the reflections sessions or breakout sessions where senior consultants stepped out of role to explain tasks or concepts to their groups). However, 75% of the participants indicated that interacting with teammates and clients was what they considered to be the most valuable aspect of the course. In this category they cited working in teams, interactions involving coach and client feedback, networking with other new consultants, and giving presentations to and interacting with clients. On the whole the results were positive.

Learners' comments from this question in the survey:

Subject 1:

> The presentation to the [client role players] at the end of the course and their feedback.

Subject 2:

> Definitely the face time with the [role play] executives.

Subject 3:

> Getting to know people within Millennium and start to understand the way Millennium works.

Subject 4:

> The client simulation.

Subject 5:

> There were two invaluable things for me. First, just getting all the orientation material and getting that out of the way at first was very nice. I can't imagine having to have had to fill out all those forms/sheets/etc. on the road at some point. Second it was GREAT to get to know so many of the other new faces. The 2-week orientation with so many meant we see many familiar faces and have relationships with these people. Many times I find that I know more people than people who've been at the firm for much longer. That was a great part of the orientation.

Subject 6:

> Team dynamics … Team dynamics …

Subject 7:

I learnt what it was like on a day to day basis to be a consultant at Millennium.

Subject 8:

The real-life client situation.

Subject 9:

I can't single out one as the most valuable but here are what were useful overall: (a) working as a team (b) working as a multidisciplinary team (c) topics in breakout session, eg writing a business plan, financials, (d) being able to go back to the stuff if I get staffed on a job that needs it.

Subject 10:

Coach feedback at the end.

Subject 11:

Exposure to actual company executives.

Subject 12: (Subject did not respond to this question.)

Subject 13:

Meeting & learning from other new hires and experience Millennium pros.

Subject 14:

Developing working relationships with colleagues and starting w/the firm. Look to institute a much more regimented interaction w/staff team leads to ensure appropriate skill set matches to consultant staffing.

Subject 15:

The teamwork during the group assignment(s).

Subject 16:

Gaining a perspective of Millennium teaming and toolsets.

Subject 17:

Exposure to the consulting world, interviewing skills. For me, I was able to better grasp what an engagement might be like in all aspects—teamwork, workload, environment, etc.

Subject 18:

Meet with current Millennium employees and understand how they do their jobs.

Subject 19:

The final presentation to the client.

Subject 20:

Learning Millennium's culture.

Subject 21:

The epiphany of recognizing how inaccurate we are when estimating how long it takes to do something.

The primary goal for this Live GBS was to teach skills in quantitative and qualitative analysis, domain knowledge, communication, technical aspects, and Millennium Consulting's philosophy and approach to management-consulting projects. Another goal of this Live GBS was for learners to understand Millennium Consulting's projects as accurately as possible within the

parameters of a simulation. This involved exposing them to and letting them work with experienced consultants, role-playing clients with relevant experience, and cases based on real projects. More importantly, this meant that they experienced interacting with their peers, senior-level consultants, client personnel who are considered part of their project team, and role-playing clients at the executive level who need to be impressed by the work of the consultants. The learners also experienced the tasks involved in a consulting engagement and practiced the skills they need in order to perform these tasks.

Learners' comments from participants such as "[having] the epiphany of recognizing how inaccurate we are when estimating how long it takes to do something" by Subject 21 above illustrate how epiphanies occur from participating in the Live GBS. This is a strong reward for both designer and learner and will possibly be among their strongest memories of the course.

In contrast, when certain principles of Live GBS design are not integrated into the design of a new simulation, several elements that make a Live GBS a successful learning environment will be affected. These elements include learner motivation, authenticity, and opportunities to practice and learn targeted skills. The design of the GHA COS Live GBS course (see Table 2) and results from the post-Live GBS survey (Figure 4) given to these learners illustrate how the success of a Live GBS simulation can be affected if the design strays from the ideal template and certain principles are not applied.

Results of Post-Live GBS Survey for GHA Chief of Staff Live GBS

The questions for this survey and Millennium Consulting's PB1 survey strived to determine the value each group of participants placed on how well the Live GBSs taught targeted goals.

However, the Live GBSs and their corresponding surveys were too disparate to link to each other in a statistically valid comparison. The surveys differ in several ways: the Live GBS domains and audiences were dissimilar; and the questions participants were asked to reflect on related mostly to topics specific to each Live GBS. As the PB1 survey results revealed how following the ideal design template can lead to a successful Live GBS, the GHA COS survey provides an example of how a Live GBS can be compromised if the design strays from the ideal template at significant points.

As discussed in Chapter 4, the design process for the GHA Live GBS was intended to mirror the ideal methodology. However, because of factors such as lack of resources, lack of subject matter experts, and time restraints, the design process of this Live GBS course differed from the ideal methodology.

The survey results indicate the immediate perception of the COS Live GBS was mildly negative. Interestingly, negative learners' comments from the surveys were milder than complaints overheard by coaches and designers. A possible explanation for this is because the participants who completed the survey included their names in the headers of the evaluations, they may not have felt a level of anonymity that would allow them to freely express their frustrations. As they were required to take this course, it might not have been politically sound judgment to vehemently criticize the course in a way that could be documented and through which they could individually be identified. Therefore, of the 10 subjects that responded to the survey, some may have shown restraint when answering the following questions:

1. How long have you been Chief of Staff in your GHA hospital?
2. If applicable, how long have you been COS in another GHA hospital?
3. Have you been chief of staff in a hospital outside of the GHA? If so, for how long?
Authenticity *Please rank the effectiveness of the following elements relating to the authenticity of the Chief of Staff Live GBS.* (1=Excellent, 6=Poor) 4. How authentic was the quantitative data issued during the course? 5. How authentic were the stakeholder issues encountered during the course
Please comment on the following: 6. What would you change in the course to improve authenticity? 7. Overall Authenticity Ranking:
Collaboration and Negotiation Skill Development in the Live GBS Context *Please rank the effectiveness of the following elements relating to developing collaboration skills in the Chief of Staff Live GBS.* (1=Excellent, 6=Poor) 8. Did the activities and role players in the course provide sufficient opportunities to practice basic collaboration skills such as negotiation? 9. How well did the activities and role players in this course enhance your collaboration skills overall?
Fact-Based Analysis *Please rank the effectiveness of the following elements relating to fact-based analyses within the Chief of Staff Live GBS.* (1=Excellent, 6=Poor) 10. Did the course provide sufficient opportunities to practice fact-based analysis?
11. How beneficial was creating a proposal/recommendation presentation to developing fact-based analysis skills?
12. How well did the course support creative problem solving? 13. In general, how well does the course support the development of fact-based analysis skills? 14. How well did this course enhance your fact-based analysis skills overall?
Please comment on the following: 15. What was most value aspect in this area? 16. How would you change this aspect of the course?

Figure 4: Post-Live GBS Survey for Chief of Staff Live GBS Participants

(continued)

Collaboration Among Participants of the Live GBS

Please rank the effectiveness of the following elements relating to fact-based analyses within the Chief of Staff Live GBS. (1=Excellent, 6=Poor)

17. Did the Live GBS provide sufficient opportunities to practice collaboration skills?
18. Did the Live GBS provide sufficient opportunities to practice active listening?
19. Did the Live GBS provide sufficient opportunities to practice meeting facilitation?
20. Did the Live GBS provide sufficient opportunities to mentor your colleagues?
21. Overall, how well did this course support collaboration with your colleagues?

Please comment on the following:

22. What was most valuable aspect in this area?
23. How would you change this aspect of the course?

Hospital Network Team Building

Please rank the effectiveness of the following elements relating to thinking as a member of a hospital network team and working with the members of your team. (1=Excellent, 6=Poor)

24. Did course provide opportunities to learn and practice the approach to working as a team?
25. Did course provide opportunities to learn and practice problem-solving approaches that benefit the hospital network?
26. Overall rating for effectiveness of Live GBS in teaching network team skills:

Please comment on the following:

27. What was most valuable aspect in this area?
28. How would you change this aspect of the course?

Overall Rating of Live GBS Course

29. How prepared would a new chief be for a consolidation experience? (*1=very prepared; 2=fairly prepared; 3=neutral; 4=not well-prepared; 5=poorly prepared*
30. I would like to see the course expanded (1) or shortened (4) or eliminated (5)

Please comment on the following:

31. What was most valuable about the course?
32. What changes would you make?
33. Additional comments:

Figure 4: Post-Live GBS Survey for Chief of Staff Live GBS Participants

Average Scores for the GHA Chief of Staff Live GBS Course

Results Regarding Authenticity

The average score for question #4 regarding the perceived authenticity of the quantitative data was 3.8, which indicates a negative perception of authenticity. The average score for question #5 regarding the perceived authenticity of stakeholder issues learners encountered during the course was 3.2. And, the average score for question #7 regarding the overall perceived authenticity of the course was 4. In this survey, a score of 4 or higher indicates moderate to strong negative impressions of authenticity. The ratings alone indicate the participants did not feel the data or stakeholder issues introduced to them during the course contributed to authenticity.

The comments below are also from this section of the survey. They not only reinforce the perception that some of the data were incorrect, but they also raised the issue that the data gathering methods were insufficient and the mission was not challenging enough for COSs. The physical environment of the course did not lend itself to the needs of the course. It needed to support communication between team members and operating staff in a way that was similar to how COSs would normally communicate with their administrative staff. For example, the telephone system in the hotel did not allow individual hotel rooms, where teams were meeting, access to conference rooms, where operating staff were stationed. The teams and staff had to communicate by handwritten notes delivered at regular intervals. This contributed greatly to their frustration and justified belief that the data-gathering methods were archaic.

The course operators were the keepers of the data, and it was critical to the progression of the case that they had relatively easy access to the data they asked for. However, some of the data

was available for some hospitals and not others. Not all hospitals or hospital networks had the same amount of data, and not all of the data was easily accessible. This was a point designers came across during the design of the course, and because this would be a reality for the COSs in their new hospital networks, there was an attempt to impart that to the participants by letting them know that some of the data they requested was either unavailable or not immediately available, yet could be found (or created) in time.

On several occasions during the run of the course, designers telephoned content experts for external assistance in creating data for unforeseen, yet reasonable requests. Unfortunately there were no reflection sessions during the run of the course in which coaches could help participants relate tasks specific to this Live GBS to those they will encounter in real situations. As a result, the participants felt the data and the data-gathering process was inaccurate.

Learners' Comments on What They Would Change in the Course to Improve Authenticity:

Subject 1:

> [Bring in] PCs and LAN to access data.

Subject 2:

> Better access to the data.

Subject 3:

> Make changes more difficult to achieve, COSs are not new.

Subject 4:

> Place higher risk on participants.

Subject 5:

Get data for home station prior to exercise.

Subject 6:

Data booklet/spreadsheet in advance.

Subject 7:

[Full-time employee figures] at Wynne (hospital) way too high.

Subject 8:

Not everyone brand new, more realistic baseline knowledge of own facilities and network geography.

Subject 9:

Better QA data (morbidity/mortality).

Subject 10:

Eliminate data collection aspects.

Learners' Comments on What They Would Change About the Course:

Subject 2:

Data in advance, define goals, shorten simulation

Subject 5:

More group and individual feedback

Subject 6:

Might “deep six” it or totally re-write as a negotiation case

Subject 7:

Some of the data conflicted.

Subject 8:

Force a tougher issue—i.e., consolidate the two large programs or close a small one.

Subject 9:

Give more hospital information and data before the exercise

Subject 10:

Minimize data analysis. Emphasize strategic negotiations aspects.

Results Regarding Collaboration Skill Development

The average score for question #8 regarding the perceived sufficiency of opportunities provided by the activities and role players in the course to practice basic collaboration skills was 4.1. The average score for question #9 regarding how participants felt the activities and role players enhanced their collaboration skills overall was 4.3. A score of 4 or higher indicates the participants did not feel the amount of opportunity to practice collaboration skills in the Live GBS was sufficient, nor did they believe the activities and role players enhanced or increased their overall collaboration skills. Although the results were negative in this category, the comments on where to improve this teaching point lean mostly toward changes in the data analysis rather than improvements in building collaboration skills.

Learners' Comments on Most Valuable Aspect of Collaboration Skill Development:

Subject 2:

Opportunity to work out a real problem, increase sensitivity to concerns at other hospitals.

Subject 3:

Seeing colleagues interact, seeing that same data may be interpreted differently, realizing I never listen to anyone.

Subject 9:

[The] simulation.

Subject 10:

Context specific chance to try out and experiment with negotiation.

Learners' Comments on What They Would Change About This Aspect of the Course:

Subject 3:

Keep refreshing.

Subject 5:

Individual feedback.

Subject 7:

I think this goal was swamped by the data analysis.

Subject 10:

Make problem much more difficult to solve (i.e., merge to large facilities.)

Results Regarding Fact-Based Analysis

The average score for question #10 regarding the perceived sufficiency of opportunities provided in the Live GBS to practice fact-based analysis was 3.9. The average score for question #11 regarding how beneficial participants felt creating a proposal/recommendation presentation was to developing fact-based analysis skills was 3.7. The average score for question #12 regarding the Live GBS's perceived effectiveness in supporting creative problem solving was 3.6. The average score for question #13 regarding the Live GBS's perceived effectiveness in supporting the development of fact-based analysis skills was 3.6. The average score for question #14 regarding the participants' feeling of how well the course enhanced their fact-based analysis skills overall was 4.4. The participants were fairly neutral in their opinions about having enough opportunities to practice fact-based analysis, that the overarching mission of creating a proposal with recommendations was beneficial, and that the Live GBS supported creative problem solving and fact-based analysis skills. However, the general opinion of the Live GBS's overall effectiveness on the development of fact-based analysis skills was relatively poor. Yet, their comments on this do not mirror prior complaints of inauthentic data, but rather point to the data-gathering approach and imply that they would prefer to be provided the data and, although this was not stated, this would enable them to spend more time focusing on doing the analysis, and negotiating with teammates.

Learners' Comments on Most Valuable Aspect of Fact-Based Analysis Skill Development:

Subject 3:

Coming to a "creative" resolution.

Subject 5:

Data was fairly authentic in scope and reliability.

Subject 7:

May not really have increased skills, but did enable a collaborative approach to the analysis.

Subject 8:

Our own rapid development of a spreadsheet.

Subject 9:

None.

Learners' Comments on What They Would Change About Fact-Based Analysis Skill Development:

Subject 2:

Predistribution of data.

Subject 10:

Provide all data and an internal strategic analysis and recommendations.

Results Regarding Collaboration among Participants of the Live GBS

The average score for question #17 regarding the perceived sufficiency of opportunities for learners to collaborate with teammates was 3.8. The average score for question #18 regarding the perceived sufficiency of opportunities for learners to practice active listening was 3.6. The average score for question #19 regarding sufficient opportunities to practice meeting facilitation was 3.7. The average score for question #20 regarding sufficient opportunities to mentor colleagues was 4.3.

The average score for question #21 regarding how well participants felt the Live GBS course supported their collaboration efforts with their colleagues was 4.0. It is apparent that this was a teaching point lost upon the participants. Had reflection sessions been integrated into the course, participants would have been able to relate the significance of the tasks in the Live GBS to the tasks they would have to perform in real life and skills they would need to develop and practice, such as those involved in negotiation with peers, in order to successfully reach their goals. The fact that collaboration was a teaching point rather than a means for the teams to reach their explicit goal of recommending a solution was not made clear until the debriefing session between participants and designers after the Live GBS was over and the surveys were completed. Reflection sessions after key activities, for example, are valuable ways to bridge the Live GBS to real life, clarify ambiguities and misconceptions, help learners abstract lessons from the activities, and allow participants to learn from mentors' and each other's experiences.

There were no learners' comments from participants on the most valuable aspect of collaboration among participants.

Learners' Comments on What They Would Change About Collaboration Opportunities Within the Course:

Subject 3:

Make it clearer this is a course goal.

Subject 4:

More individual feedback.

Subject 8:

Did not use the opportunities that much, structure the group process more, designate a chair, perhaps give some training in group process skills as part of course before exercise.

Subject 10:

Fixing other parts of course will enhance this key component.

Results Regarding Hospital Network-specific Team Building

The average score for question #24 regarding opportunities the course provided to learn and practice working as a team with network-specific goals was 2.4. The average score for question #25 regarding opportunities to learn and practice problem-solving approaches that benefit the hospital network was 2.9. The average score for question #26 regarding the overall rating for effectiveness of Live GBS in teaching thinking as a network team was 3.1. This section of the survey relates to the strategic approach to thinking about problems and solutions in terms of how it would benefit or hurt the hospital network as a whole. This goal was made explicit by the network director as he delivered the overarching mission to the teams at the beginning of the simulation. Because this was made explicit, this goal received positive scores from participants.

Learners' Comments on the Most Valuable Aspect of Hospital Network Team Building:

Subject 10:

Context-appropriate.

Learners' Comments on What They Would Change About Hospital Network Team Building:

Subject 2:

Define goals and conditions more stringently.

Overall Rating of the GHA Live GBS Course

The average score for question #29 regarding how well-prepared a new COS would be for a consolidation experience after taking this course was 3.5. The average score for question #30 regarding whether or not participants would like to see the course expanded, shortened, or eliminated was 3.9. The rating of 3.9 is consistent with suggesting that the Live GBS be shortened (a rating of 4.) The comments on what participants would change about the course reflect this impression.

Learners' Comments on Most Valuable Aspect of This Live GBS Course Overall:

Subject 2:

Opportunity to see different viewpoints.

Subject 3:

[I learned to] listen carefully.

Subject 9:

Dealing with data.

Learners' Comments on What They Would Change About This Live GBS Course:

Subject 2:

Shorten, data up front, better defined goals, more stringent conditions.

Subject 9:

[Make it] shorter.

The responses of the participants of this survey when compared to those of the PB1 survey imply that the GHA course would have been more successful had this design corresponded closely with the ideal design template. However, because the GHA course was not as successful as the PB1 course, which did follow the ideal template, the hypothesis that the ideal design methodology is the standard for creating Live GBSs is reinforced. As discussed in the previous chapter, some principles of Live GBS design were created as a result of lessons learned from previous designs. The specific areas in which this particular Live GBS design did not follow the ideal methodology led to the development of certain principles of design to be applied to future designs.

Conclusion and Suggestions for Future Work

The main contributions of this dissertation to the field of the Learning Sciences is the codification of a methodology for Live GBS design with a template for Live GBS design and an evolving set of design principles that apply to each step within the methodology. Although there

are limitations involved in their design and implementation (discussed in Chapters 2 and 3), Live GBSs are an effective means of:

1. Teaching specific problem-solving and soft skills needed for solving a problem by immersing the learners in a live, human-led simulation of an authentic case;
2. Allowing learners to give open-ended, creative solutions to problems;
3. Providing feedback that can dynamically change with learners' actions and reactions in the course; and
4. Giving learners an opportunity to practice skills and use authentic data in an environment that closely resembles the actual one in which they will be performing after the course.

The set of principles in Chapter 5 were derived from the PB1, PB2, and GHA Live GBSs. This is a developing set of principles, introduced as a starting point from which a more elaborate hierarchy of design principles can evolve. As new designers apply the methodology, successes, failures, and lessons learned inform the set of principles and future Live GBS designs. The Live GBS design methodology can also be extended, involving considerations and changes that would occur with the design of hybrid courses such as computer-based and human-led GBS courses.

Additional work could entail researching the use of learners' knowledge of a given domain and targeted skills before and after participating in traditional instructional methods and Live GBSs to determine whether or not there are substantial differences in knowledge retention and learning attributable to Live GBSs. There is suggestive evidence that Live GBS learners may be better able to transfer concepts to new problems and that Live GBSs have an impact on self-directed learning skills, and on learners' motivation. The results of the surveys in this paper show that when Live GBS design embodies the design principles, participants of the simulations find the

learning environment more stimulating than in conventional courses. Ideally, a good Live GBS design should effectively:

1. Teach learners how to perform analyses that they would do in actual projects;
2. Give them opportunities to practice interacting with clients, and work in a team;
3. Put learners into a situation that could unearth their own strengths and weaknesses;
4. Give learners a safe environment in which to fail and learn from their mistakes; and
5. Allow them to experience working on an authentic case so that when they actually have their first problem-solving experience in the field, it will feel familiar to them.

Ultimately, it is hoped that after learners experience a Live GBS and spend some time in the field, a good design would evoke a response similar to this learner's comment:

> I really enjoyed every bit of it, including getting our heads handed to us for being too aggressive with our "clients." Scott's [role player] comments were on the money …. Would rather learn it this way than in real life."

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