The Theoretical and Practical Considerations for Effective Design, Development, and Evaluation of an Asynchronous Review Module on Interpersonal Communications

Randall J. Hollandsworth

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Dr. Barbara Lockee, Chair

Dr. John Burton

Dr. Terry Wildman

Dr. Kurt Eschenmann

Dr. Tom Wilkinson

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ABSTRACT

This research evaluates the theoretical and practical capabilities for design, development, and evaluation for a computer-based learning module for interpersonal communications. A Type One developmental study provides an asynchronous review module for a professional leadership training provider to follow up instructor-led training. The module consists of elearning review modules and animated simulations to practice the scenario-based skill practice. The literature review identifies that using online technologies as an instructional strategy offers specific advantages for summative learning strategies. In addition, studies find computer-based role-playing strategies can enhance the learning of interpersonal skills. The use of computer-based, asynchronous strategies build from the findings of four relevant studies: Weller and Blaire's' (1977) use of computer-assisted judging and feedback; Schroeder's (1986) use of videodisc technology to effectively teach interpersonal skills; Kass, Burke, Blevis, and Williamson's (1993) Guided Social Simulation Model; and Holsbrink-Engel's (1997) use of computer-based role plays. One key finding from the various studies suggests that transfer of learning and skill application are dependent on post-instructional maintenance following the initial learning event. This review investigates the elements of learning interpersonal communications, the application of asynchronous strategies to achieve this learning, and effective post-instructional strategies that support comprehension and skill transfer.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

Overview

In a discussion between Plato to Glaucon on educating the youth as philosopher kings, Plato states, "an autonomous person should never learn a subject in a slavish fashion" (Plato, trans 1993, p. 270). Plato continues by stating:

> "It's true that if physical work is performed under compulsion, the body isn't impaired, but compulsory intellectual work never remains in the mind. Therefore, the educational environment in which you foster your younger generation should be light-hearted rather than authoritarian. This will also help you to see what natural abilities every one of them has" (p. 271).

B. F. Skinner references this same quote in his 1968 book, *The Technology of Teaching*, in his statement "avoid compulsion, and let your children's lessons take the form of play" (p. 149). Skinner aligns this perspective with the use of instructional technologies such as teaching machines from that time. Skinner posits that a student's learning from the environment requires allowing the environment to do the teaching (Skinner, 1968). This discourse on instruction has crossed an enormous continuum of cognitive theories, instructional strategies, and technology since both Plato and Skinner's writing. It is the purpose of this developmental research project to apply these theories, strategies, and technology to support the learning needs defined in this work. That is, to make learning challenging, contextual, and to create an atmosphere of "review and practice" in a professional learning environment.

This research investigates the capabilities of a post-training application to sustain learner knowledge and to enhance skill transfer through asynchronous technologies.

Online instructional strategies remain the focus in this study with a critical focus on instructional methods and asynchronous media. Key theoretical concepts on the construction and recall of knowledge from the studies of cognitive psychology, the studies of behaviorism, and constructivism provide the theoretical framework. This review considers the instructional impact of effective instructional design, environmental effects, and cultural effects. Finally, the review will highlight elements of training evaluation and theoretical instructional models for skill transfer. The target population for the investigation will consist of adult learners in professional learning environments, with the research goal of generalizing the findings to a broader population, including education and other disciplines.

The development of training opportunities for interpersonal skills for business, education, and service-based organizations remain a fluid process. One shift in pedagogical approaches has been the use of computer-based learning and distance learning applications. Bainbridge (1995) suggests that, "half of all interactive media are based on soft skills" (p. 5). The use of technology as an instructional strategy for interpersonal skill development offers specific advantages such as reduction of learning time, reduction of expenses, consistency of message, and the ability to replicate realistic and safe practice experiences (Bainbridge, 1995). The American Society for Training and Development (ASTD) reports that in 2002, online technologies represented 8.5 percent of all training initiatives in the United States (Thompson, Koon, Woodwell, and Beauvais, 2003, p. 3). In an era of instructional return on investment and outcome measure, establishing a methodology for the design of post-instructional strategies in interpersonal skills could improve the effectiveness of computer-based strategies and reinforce the need for summative follow-up.

The application of online and computer-based learning strategies for the development of interpersonal skill training is not a new concept. In a 1997 study, Holsbrink-Engels (1997) states, "computer-based role playing enhances the learning of interpersonal skills" (p.164). However, the analysis of research on social skills training offers only scant evidence that it has typically been an effective strategy (Hallahan, Kaufman, and Lloyd, 1999). All of these studies are indicative of the complexities of learning interpersonal communication skills and the difficulty in effectively measuring learning impact. Defining effective strategies and media to enhance long-term knowledge and the skill transfer of these skills reflect the overall goals of this research and investigation.

Type of Research

This research addresses the professional development of adult learners in a specific training context through Type One developmental research. A Type One developmental research applies program design, development, and evaluation (Richey & Nelson, 2001). This form of inquiry includes the use of traditional research methods embedded in a developmental project. A Type One approach implies gradual growth, evaluation, and revision. Research goals for a Type One approach are to describe and document a particular design process; utilize a range of traditional research methods; apply design and development procedures; draw contextually specific conclusions from the research; and disseminate exemplary design, development, and evaluation strategies (Richey & Nelson, 2001). The conclusions sought in this research ideally define improvements in the instructional product, define conditions that promote successful use

of the product, and define conditions conducive to efficient design for future products of this contextual nature.

Research Question

The opportunity to provide learning that supports the retention of knowledge and the transfer of skills is the primary goal of this research. Seeking to sustain skills, knowledge, and attitudes acquired in the original class-based program through rehearsal methodologies reinforces what asynchronous learning can offer. To achieve this goal, the formative collection of feedback and data from participants and an expert review panel becomes critical for an effective developmental model. The research question for this developmental research states:

> What are the theoretical and practical considerations for effective design, development, and evaluation of an asynchronous post-instructional learning review module for interpersonal skills?

After this formative approach to development transcends, the findings on the use of computer-based simulations, computer-based learning strategies, and cognitive psychology are analyzed to justify the program interface and operability. The methodologies and instruments defined in Chapter 3 - Methodology, support the purpose of this research effort through effective data collection, analysis, and formative development of a computer-based learning module.

CHAPTER 2: LITERATURE REVIEW

Overview

In this chapter, a literature review is provided on key theoretical findings and professional applications for the use of an asynchronous learning module on interpersonal communications. A focus on the development of content on interpersonal communications offers supporting literature on the use of computer-based and scenario-based learning. Key readings in theoretical and philosophical findings on learning are provided with a specific focus on ill-structured problem-solving, retention of knowledge, and skill transfer to application. Finally, a view of the instructional impact on learning is reviewed to support the elements of training follow-up and furthering learning.

Establishing Content for Interpersonal Development

A definition of interpersonal skills is necessary in order to assess effective computer-based content for interpersonal skill development. Interpersonal skill development offers broad applications across numerous life experiences and disciplines. In this literature review, the target audience derives from professional leadership development genres. An in-depth look at how people learn interpersonal skills offers direction for effective pedagogical practices and evaluation for these skills and knowledge. A summary of the content and its application in professional development establishes an effective transition into the areas of delivery, learning philosophies, and evaluation.

Defining Interpersonal Skills

Interpersonal skill training serves to prepare managers and professionals for the challenges faced in the school, at home, and in the workplace. Holsbrink-Engels (1998) makes reference to the goal of interpersonal skill training "to train novices to think like professionals" (p. 2). Interpersonal skills, according to Ellis and Whittington (1981), categorize into three broad categories for higher order problem solving as shown in Figure 1.

a) *Developmental:* Basic skills that children develop, as social skills.
b) *Remedial:* Functional skills not yet developed, as in psychotherapy.
c) *Specialized:* Professional encounters, as managers may need in organizations.

Figure 1. Three perspectives on interpersonal skills (Holsbrink-Engels, 1997, p. 3).

In the definition of interpersonal communication skills provided in this paper, these three classifications categorize the levels of application inherent in personal communications. Although learners may participate in a learning event for interpersonal communication skills with varied levels of mastery at the developmental and remedial levels, the expectation in a professional environment would be that of attaining and measuring specialized skill levels.

Interpersonal skills are situational in nature and measured on a relative, not absolute scale (Cohen & Rustad, 1998). Holsbrink-Engels (1997) further classifies

professional, or specialty, interpersonal skills as shown in Figure 2.

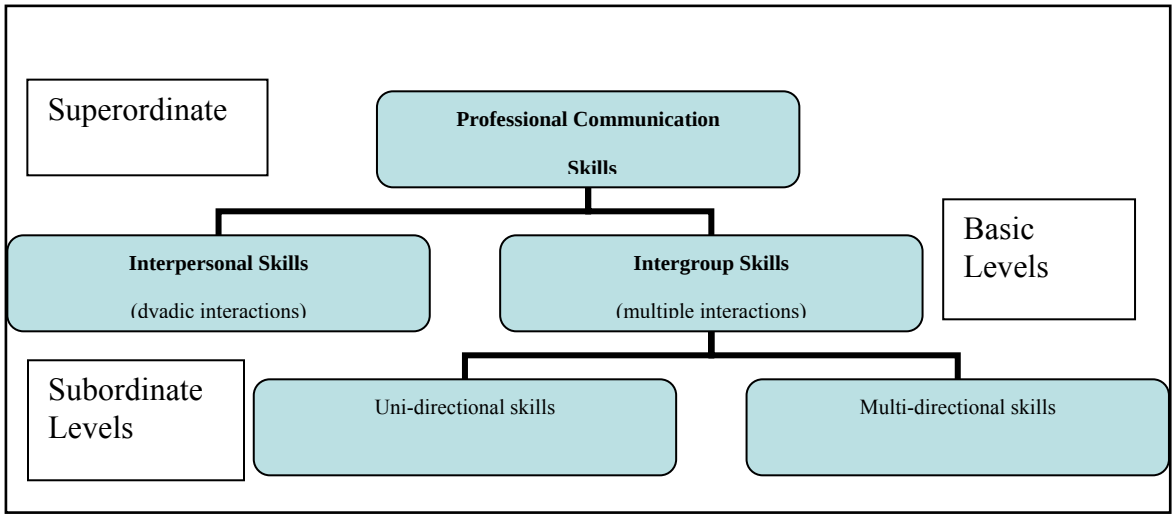

Figure 2. Classification of communication skills (Holsbrink-Engels, 1997, p.4).

The levels of professional communications break down into super-ordinate, basic, and sub-ordinate levels (Holsbrink-Engels, 1988). A textbook by Stewart (2002) on communication theory defines interpersonal communication as, "a subset of the communication process, a type or kind of contact that happens when people involved, talk and listen in ways that maximize the presence of the personal" (p. xiv). The need to develop social skills through explicit training reaches beyond just leadership development, embracing counseling and education. The super-ordinate levels entail the synthesis of skills achieved in oral communications including the use of verbal, visual, and vocal communications. These skills might fall within the categories of linguistic and non-linguistic communications. Linguistic communications involves vocal applications entailing pitch, volume, tone, speed, accent, and silence (Holsbrink-Engels). Non-linguistic communications focus on the visual parameters of communication such as body space, facial expression, head movements, posture, and gestures (Holsbrink-Engels). The basic levels of professional interpersonal communications represent a type of contact

occurring when people engage and interact. An example might be when an involved person talks and listens in a way that maximizes the presence of the personal (Stewart). The use of interpersonal skills references the use of skills called, *nexting*, or doing something to keep the conversation going (Stewart). Basic-level skills focus on professionals in specialty skill development. The skills might include initiating a conversation, joining a conversation, managing conflicting situations, and maintaining relationships. One key skill necessary at the basic-level is the practice of effective listening.

Listening is a complex activity involving four elements, according to Bainbridge (1995), defined as hearing, interpretation, evaluation, and responding. Bainbridge highlights the purpose of these four elements as shown in Figure 3.

a) *Hearing*: The physiological process of receiving aural stimuli, selective attention, and noise.
b) *Interpretation:* Cognitively and emotionally processing of sound waves leading to understanding or misunderstanding of the message.
c) *Evaluation:* Deciding how to use the information to achieve goals, maintain relationships, or solve problems.
d) *Response:* Reacting to the message and information through overt and/or invert behaviors.

Figure 3. Four elements of listening (Bainbridge, 1995, p.122).

A term commonly used in the professional development of interpersonal communications is active listening. Active listening involves the paraphrasing, expressing understanding, asking questions, and using verbal and nonverbal communications to establish a level of empathy and understanding of the message. Hallahan et al. (1999) posit that the reception of information constitutes the act of listening. All of the basic level skills, dyadic or multiple interactions, focus on the same goal of professional and personal success in developing relationships and achieving

goals. In other words, employees must be competent communicators both individually and in groups. The use of the fore-mentioned pragmatics, specifying how language applies in social situations, is the cornerstone of the basic-levels of communication.

In the subordinate categories, a differentiation between unilateral and multilateral inter-group skills is suggested by Holsbrink-Engels (1997). Specifically in professional environments, communicators must interact with individuals by sending a one-way message to groups (e.g., a presentation or lecture involving one sender and a group of passive listeners). The multilateral inter-group skills involve interactions with multiple involvement and messages. Considering the target audience of this research project, people in professional leadership positions, the super-ordinate, basic, and subordinate skill levels are all applicable. The following section defines how the effective use of communication skills reflects the quality of leadership in professional environments.

Applications for Leadership

The specialized skill of interpersonal communications, within the scope of leadership development, is increasingly growing as the external world changes. In an effort to narrow the scope of this wide array of theories, models, and pioneers in management research, this paper will apply a working definition of skills, from the American Society for Training and Development [ASTD]. The "interpersonal skills" addressed in this paper is best defined by the ASTD: "Training in communication and cooperation among individuals and groups, including conflict resolution, stress management, diversity training, teamwork, and group dynamics" (Buren, 2001, p. 29). Professional perceptions and organizational measures support the value of interpersonal skills as being critical for good leadership and organizational success. In a study

conducted by Watson Wyatt Worldwide (2003), an international consulting firm focusing on human capital and financial management, a survey was administered to 267 companies representing all major industry sectors on the effect of communications on financial success. In Figure 4, the study indicates that companies with the highest effectiveness (1.34 for average Q, or surplus value) in communications experienced a 26 percent total return to shareholders from 1998 to 2002, compared to a negative 15 percent return experienced by those organizations with the least effectiveness in communications (Watson Wyatt Worldwide).

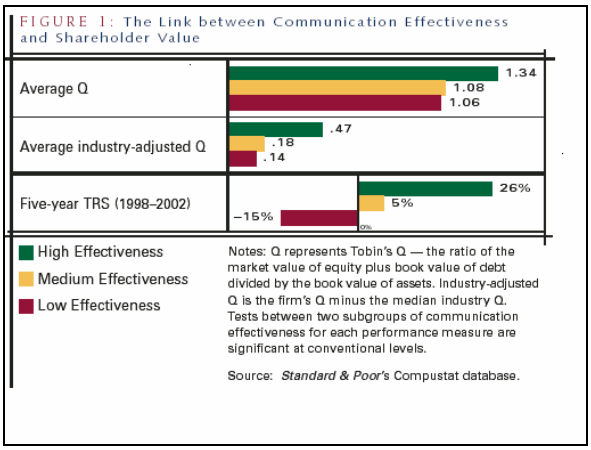

Figure 4. Communications and shareholder value (Worldwide, 2003, p. 3). Reprinted with permission from Connecting Organizational Communication to Financial Performance, 2003/2004 Communication ROI Study © 2003 Watson Wyatt Worldwide. For more information, visit www.watsonwyatt.com.

The change in surplus value, or Q, represents a 26 percent change equating to an investor making $126.00 for every $100.00 invested in a company with high effectiveness in communications (Watson Wyatt Worldwide).

In addition to organizational outcomes, interpersonal communication skills are a key attribute associated with effective leadership. One premise is that interpersonal skills are composed of higher order knowledge that are applied routinely (Gagne, 1988). In an age of "*participative management*", leading authors on the subject of leadership have

commented on what effective leaders require for success. Dr. Thomas Gordon noted that "being untrained in the requisite skills for building good relationships and group-centered teams, they are unable to harness the creativity of team members. They fail because they do not know how to build equalitarian or partnership relationships" (Gordon, 2002, p. 3).

Another prominent author on leadership, Stephen R. Covey, commented in his book, *The 7 Habits of Highly Effective People* (1989) that, "When you listen with empathy to another person, you give that person psychological air. Moreover, after that vital need is met, you can then focus on influencing or problem solving" (p. 241).

Interpersonal skills support the professional communicator in the following applications, as shown in Figure 5.

a) Promoting what a person wants to say.
b) Managing what a communicator is willing to reveal.
c) Comprehending what a person actually hears.
d) Managing the social timing and situational responses of events.
e) Contributing towards an overall positive organizational climate.

Figure 5. Key events supported by effective interpersonal skills.

Communication skills could also further the efforts of the organization through more effective communication of expectations, reporting relationships, constraints, resource availability, information updates, performance coaching, and general encouragement. Interpersonal skills encompass a number of skills relative to personal, academic, and professional success in today's world. The ASTD indicates that six percent of all professional training focused on interpersonal communication in 2002 (Sugrue, 2003, p. 3). From a cost perspective, this six percent represents a sizable portion of the $11.1 billion dollars total training expenditures in the United States in 2002, according to

ASTD's training investment leaders (Sugrue). The focus of this paper will be on specialized interpersonal skills for individuals working in organizations. In an effort to define interpersonal communication skills, the following sections identify effective practices for instruction, learning, and evaluation.

Learning Interpersonal Communication Skills

Learning any leadership-based skill through formal or informal training environments is a complex task. At its simplest level, Robert F. Mager (1992) defined any performance enhancing experience as being driven by six simple rules as shown in Figure 6.

1. Training is required for something that a person does not know how to do.
2. If they already know how, more training won't help.
3. Skill alone is not enough to guarantee performance.
4. You can't store training!
5. Trainers can guarantee skill, but they cannot guarantee performance.
6. Only managers, not trainers, are held accountable for on-the-job performance

Figure 6. Robert Mager's six rules for performance enhancement (Mager, 1992, pp. 6-18).

Mager's rules speak clearly to the general level of acceptance by trainers, managers, and employees on improving performance in the professional world. All of these efforts are an effort to make "*training stick"* as advocated by Mager. A method for building measurable and performance-enhancing learning initiatives into any organization is achieved best through effective instructional design. The works of Gagne, Briggs, and Wager (1988) are instrumental in the research on instructional design. Engaging in communications with employees and others involve a cadre of rules, defined concepts, concrete concepts, and discriminations. Gagne et al. found the combination of these

intellectual skills considered a higher range of intellect, classify as problem solving. Jonassen (2000) reports on problem solving, "as the most important learning outcome for life" (p. 63). Because of the situational context of learning interpersonal skills, defining how one best learns these skills requires further definition.

Learning interpersonal skills is dependent on the learner's behaviors, the other person's behavior and attitude, and the setting in which the interaction occurs. Learners adopt mental models that are flexible and adaptive to varied social situations. The learning of interpersonal skills is a fluid process with a less fixed temporal order of learning involved (Holsbrink-Engels, 1997). Interpersonal communication skills are a series of synchronized cognitive and social skills where timing is critical. In addition to the complexities of learning interpersonal skills, the goal of human development must meet the criteria of effective training. These criteria would include reducing learning time, reducing training costs, providing a consistent message, and providing quantifiable measures of learning impact. Finally, interpersonal skill development requires human interactive elements while considering the frailty of professional and personal relationships. In other words, the cost of mistakes can be high and replication of real life becomes more complex and difficult to accomplish within a certain sequence of behaviors. Interpersonal interactions require a specific goal or intention, connected with appropriate response, and effective changes or reinforcement of social behaviors and relationships. The sections on learning philosophy analyze in more detail the cognitive, behaviorist, and constructivist influences. However, the following section seeks a more holistic understanding of how interpersonal skills are learned.

Building relationships through effective interactions requires self-presentation, self-awareness, self-acceptance, and the risk of self-disclosure (Stewart, 2002).

Interpersonal skills represent a self-presentation process where we try to shape what others think of us and influence what we think of ourselves through dialogue (Stewart). Dialogue is defined as, "a form of discourse, not oppositional but collaborative, where the proposed outcome is not ascendance but fusion to give a larger view" and "a relational space, ontological aspect of dialogue, the dialogic way of being another person" (Stewart, p. 597). Buber (1997) continues this definitive logic with his writings on how interpersonal communications require the learner to become the between, the inter-human, and the I-Thou in an interaction. The I-Thou approach is characterized by trust, openness, presence, and an understanding of the other that arises not from psychological compatibility but a shared humanity (Stewart). One perspective by Stewart is, "that the single greatest barrier to dialogue is the pervasive human impulse to defend one's identity, one's self "(p. 603). One of the key steps for mastering interpersonal skills is recognizing and learning to establish a presence within the interaction.

The application of interpersonal skills and inter-group skills becomes necessary in any environment. Therefore, interpersonal skill training must become much more than just the words, but the understanding of things that accompany the words (Stewart, 1997). A key set of skills for interpersonal development is effective problem solving as shown in Figure 7.

1. Identify the situation.
2. Define the other person.
3. Define yourself and your relationship with the other person.
4. Figure out why things unfold the way they do.

Figure 7. Problem-solving skills for interpersonal interactions (Stewart, 1997, p. 169).

The learning of interpersonal skills is dependent on the pedagogical strategies and methodologies applied. The focus of this research evaluates how interpersonal skills occur in conjunction with the application of asynchronous distance learning. The research will focus more specifically on how to apply these strategies and technologies to impact learning and transfer with post-instructional interventions. The following section will highlight how the literature has defined the most effective strategies for instructing interpersonal communication skills and higher-order problem-solving skills applicable across any instructional methodology.

Teaching Interpersonal Skills

Professionals seek to establish relationships, solve problems, articulate and organize, and align individual daily activities with organizational strategic visions. Hallahan et al. (1999) denotes that interpersonal skills support the social learning necessary for students with learning disabilities to manage problems with social competence. Regardless of the application, teaching interpersonal skills requires a higher-order of knowledge. Interpersonal skills involve a complex learning environment. As stated by Holsbrink-Engels (1997), "cognitive load is high during social-communicative problem solving because the execution of all steps has to be taken immediately in a goal-directed dialogue" (p.53).

Teaching social skills involves two major difficulties; one is the infinite number of social situations requiring goal-based interactions. The second difficulty is that social skills cannot be taught in packages, the learning requires smaller units such as listening, being polite, being cooperative (Yates, 1978). Hallahan et al. (1999) defined that teaching social skills requires explicit training. From the perspective of teaching social

skills to learning disabled students, Hallahan et al. state that, "to teach desired behaviors one must intervene early, give effective instructions, provide effective modeling, structure choices, and use positive reinforcement" (p. 255). This pedagogical template for interpersonal communication applies across many disciplines. Holsbrink-Engels (1998) states, "learning through modeling is done vicariously" (p.18). Individuals also learn through categorization of skills, such as consulting, selling, and public speaking. As noted by Holsbrink-Engels, "categorization has a memorization aspect that entails remembering a label and some common characteristic of a concept" (p.18). The use of scripts, or schema acquisition, for learning complex problem-solving skills is critical. Scripts are necessary due to our limited cognitive capacities and need for long-term memory retrieval. The need suggests that interpersonal skills instruction achieves opportunities for observation, categorization, and schema acquisition. From the perspective of teaching social skills to learning-disabled students, Yates (1993) highlights that, social skills should be taught in social situations. Yates further notes that if the social situations are unavailable then role-play serves as the second best method for instruction.

Role-plays replicate social situations in the natural environment where the skills are applied. Holsbrink-Engels notes the history of role-play goes back to the ancient Greeks but the Viennese psychiatrist Moreno illuminated the process in 1946. Moreno applied the skills in reform schools as a therapeutic tool for the release of emotions through psychodrama and socio-drama activities (Holsbrink-Engels). The focus of these role-play sessions were on emotional and behavioral confrontations as the central activity. Gagne (1978) speaks to this representation of real situations as noting that simulations are equal to the same as reality without task irrelevant elements. Van Ments

(1983) relates that role-plays, used in instructional settings in their simplest form, involve people into an imaginary scenario as themselves or other people. The participants then behave to that role with the goal of the participant and the class mastering situational and interpersonal concepts. Van Ments notes that learners are unable to keep the events in order on what is learned due to high cognitive load. Because of this high cognitive burden, Van Merrienboer, Schuurman, de Croock Jelsma, and Paas (2002) suggest that some interpersonal skills require the ability to adapt the events to longer-term memory. In order to accomplish this, role-plays require a structured process in preparation for the learning, during the learning, and following the learning.

The use of role-plays to develop interpersonal skills can be very effective due to the higher degree of interactivity that is required (Yates, 1993). This learning strategy allows individuals to develop social rules for interpersonal communications but also allows for drill and practice in a safe environment. Holsbrink-Engels (1997) developed a model for problem solving through her research on the use of computer-based role-plays for interpersonal communications where learners follow three phases of learning with this strategy. The strategies are defined as: (a) developing awareness of a social communicative problem, (b) defining and exploring the problem, and (c) solving the problem through goal setting, listing solutions, selecting a satisfactory solution, and performance of the communication skill (Holsbrink-Engels, 1997, p. 14). The aspect of frequency of practice for these three processes appears to be a link to the successful development of schemas or scripts. Cohen and Rustad (1998) established that drill and practice on social rules and simulated role-play activities are critical. They further note that communications instruction reflects teaching symbol systems, non-verbals, and simulated conversations (Cohen and Rustad). Effective strategies for instruction are

critical for the success of role-play applications. Holsbrink-Engels (1997) recommends the following ten-step model for designing role-plays as seen in Figure 8.

1. Develop training objectives.
2. Conduct a needs-assessment.
3. Conduct a task-analysis.
4. Develop behavioral generality and demonstration of expert approach.
5. Generate social communicative problem.
    a. Identify protagonist (practice task)
    b. Identify antagonist(provides resistance)
    c. Define context and problem
6. Develop introduction to role plays.
7. Present the generality and modeling- teach model and show expert approach.
8. Present social-communicative problem.
9. Practice the role-play.
10. Reflect and articulate the experience.

Figure 8. Ten-step model for designing role-plays (Holsbrink-Engels, 1997, p. 36).

Even with structured design and development of the instructor-led role-play event, problems can still occur in the learning. Some of the major problems encountered in instructor-led role-play events are players departing the role, burlesquing or hamming it up, poor role performance, lack of insight or empathy, boredom, and emotional escalation (Van Ments, 1983). Beyond a structured design, the application of varied role-play instructional strategies can alleviate some of these problems. The application of events engaging multiple opportunities for feedback, reflection, and coaching lessens the risk of low insight and boredom. The use of diverse perspectives and personalities can

contribute toward the learner's ability to transfer the skills. This transfer of general application skills allows for the development of more adaptive mental models and meta-cognition.

Some of the potential outcomes, or behavioral categories, that could be encountered by an instructor in role-play are proposing, building, supporting, disagreeing, defending/attacking, blocking, openness, testing understanding, summarizing, seeking information, giving information, shutting out others, and bringing in others (van Ments, 1983). From an instructor's perspective, these categories of behaviors can be opportunistic for learning if processed effectively. To achieve this level of processing, an established methodology of debriefing the experience and allowing for synthesis of the events must occur. Learners need time and the opportunity to reflect on role-plays (Holsbrink-Engels, 1997). It has been noted earlier in this paper that due to cognitive constraints of learners that it is difficult to establish the acquisition of schemata due to all the events that transpire during the role-play event. The debriefing serves to allow for effective reflection and synthesis of behavioral patterns and changes that a learner must engage in through self-regulation. In regards to self-regulation, the debriefing reinforces or corrects learning, draws out new points, deduces ways for improving behaviors, applies behavior to other situations, and links with previous learning and action planning (van Ments). An effective debriefing allows the learner the opportunity to reflect and to develop mental models for more effective social communicative problem solving. The outcomes of interpersonal skill development are dependent on effective instructional strategies that link to performance objectives and actual need. The following section addresses interpersonal skill development comprehension and application.

Summary of Content for Interpersonal Development

In teaching interpersonal skills through any specified methodology or technology, the designer must consider necessary skills, how they are applied, how people learn them, and how they are best instructed. The definition of interpersonal skill development considers the perspectives of researchers in communication science, leadership development, educational, and professional counseling. Although the use of interpersonal skill development is not limited to these disciplines, they appear to be highly referenced in the literature. Interpersonal skills are about effectively maintaining relationships or managing social communicative interactions. The categorization of skill levels in interpersonal skill development by Ellis and Whittington (1981) are defined as: developmental, remedial, and specialized. The research focus of this literature review has been on the specialized category of skills. As Stewart (2002) defined it, the use of *nexting*, or the ability to keep the flow of communications moving within a positive environmental climate, is the key to expertise in interpersonal skills. One key skill set that supports the ability to perform "*nexting*" is that of listening. Bainbridge (1995) defined listening as the ability to hear, interpret, evaluate, and respond in an effective manner. In regards to this literature review, the definition of interpersonal skill development is the ability to develop schemata acquisition that allows for effective interaction and problem solving in a manner that achieves goals, offers solutions, and enhances the relationship with persons in most any environment.

The application of interpersonal skills for leadership development is reflective of many of the changes in management style and organizations in the United States that has transpired during the shift from the Industrial Revolution to the Information Age. The effect of interpersonal skill levels on leadership represents the following learning goals:

learning to say what is wanted to say; accurately revealing perspectives and ideas; ensuring comprehension of what is said; providing effective social timing and appropriateness; and contributing to a positive environment. The learning of interpersonal skills involves the synchronization of both social and cognitive skills where timing is critical. The support and reinforcement following the training are critical for successful application. This definition of interpersonal skills demonstrates the importance of just not knowing what to teach, but how to teach it. Cognitive load is high while learning interpersonal skills and the opportunity to miss details on managing a situation are highly possible. Vanlehn (1989) defines specific reasons for the high cognitive load in social communications in that problems are not well defined, execution of steps occur simultaneously, problems can change, feedback is limited, and most social communicative problems have an ill-defined goal state. In addition, Holsbrink-Engels (1997) supports the need for the learner to reflect on the experience in computer-based learning. The application of role-play for learning interpersonal skills will be the key instructional strategy employed in this research. Ensuring that learners have adequate time to reflect on their behaviors and their approach is critical for the design of interpersonal skill development. This strategy raises significant opportunities for design approaches with the implementation of computer-based methods and technologies.

Finally, it is the goal of this study to offer an environment where post-learning events can better ensure comprehension, recall, and application of interpersonal skills. The ability for these behavioral skills to form into mental models allows for efficient recall and effective transfer. The goal of achieving this transfer through a computer-based environment relies on the foundations developed in this research. This development includes ann evaluative look at which online strategies support the learning

of these skills. In this review, a synthesis builds from the platform of the definition of interpersonal skills and the media attributes of computer-based strategies.

Computer-Based Learning for Interpersonal Skills

Despite the growth and number of online methods and media, outcome research on online coursework is still sparse (Rudestam & Schoenholtz-Read, 2002). This study investigates the effects of problem-centered learning transferable for applications by learners with asynchronous tools. Richard Wellins, a senior vice president of Development Dimensions International, stated, "The perceived effectiveness of e-learning to build soft skills is pretty poor....while e-learning can be a tremendous enabler, people will not dramatically improve their interpersonal/leadership skills sitting in front of the computer alone" (Bainbridge, 1995, p. 2). The application of online methodologies to instruct interpersonal communication remains a controversial issue faced by educators in multiple environments. This section of the literature review seeks a definition on how computer-based strategies support the instruction of these skills. A closer perspective offers insight on how asynchronous strategies support this instructional challenge with the use of problem-based learning and effective interface design. Finally, this section will look at how the online learning industry and organizations have applied the use of computer-based technologies in teaching interpersonal skills.

Overview of Computer-based Approaches

The purpose of this study will not be to transcend through the history of instructional technology. The use of instructional technology began in the late 1920's and was heavily influenced by World War II in the 1940's, radio and television in the 1950's, and computers from the 1970's through today. The educational programs

analyzed in this study will focus primarily on computer-based tools, recorded media, and computer-mediated communication (CMC) tools. The mode of delivery for the programming occurs via CD-ROM, online, and/or a blended approach. An asynchronous delivery methodology is examined which entails a student-to-content interaction. Clark and Mayer (2003) define asynchronous interactions as, "opportunities for learners and/or instructors to interact with each other via computer at different times" (p. 309). Synchronous interactions are defined as, "opportunities for learners and/or instructors to interact with each other via computer at the same time" (Clark & Mayer, p. 316). There are discourses on how asynchronous programs should look, navigate, and interact with the learner. In a very basic definition of online or computer-based learning (elearning), Ruth Clark (2002) reported in the eLearning Developer's Journal, "elearning is content and instructional methods delivered on a computer (whether on CD-ROM, the Internet, or an intranet), and designed to build knowledge and skills related to individual or organizational goals" (Clark, p.2). This section of the review will consider how elearning, as defined above, supports the learning of interpersonal skills.

Two general observations are important for computer-based learning and its applications in facets of these learning applications. First, the use of computer-based learning continues a slow but steady growth compared to conventional methods. A second observation is that computer-based learning for interpersonal skills requires the structure provided by cognitive concepts, principles, and theories. Both of these observations are involved in defining the problems and opportunities for computer-based modules for interpersonal skills. Although limited in nature, research in technology-based learning for interpersonal skills does have some history. As defined in a 1986 meta-analysis by Schroeder, Dyer, Czerny, Youngling, and Agillotti, much of the research

begins with the assessment of the use of videodisc supporting military training on interpersonal skills. In addition, Alpert's 1986 study on counselor training with text-oriented computer simulations (Jonassen, 2000). In both of these studies, significant improvements were found with technology (Campbell, 1995). According to Jonassen, many of these studies recommend learning strategies such as the use of "authentic cases, simulations, modeling, coaching, and scaffolding" (Jonassen, p. 64). Bainbridge (1995) notes that technology can serve as bridge to the classroom in its' ability to set context, create interactivity, allow for experiential learning, improve people's lives, promote fun, allow for individual learning style and pace, and personalize the learning experience . Hallahan et al. (1999) posit that the analyses of research on social skills training offers only scant evidence that it has typically been an effective strategy.

So again, the question remains, "Can computer-based technology address learning needs for interpersonal communications?" Moreover, how can studies on interpersonal skill development, online strategies, and learning philosophies support this effort? An approach to answer this question must consider the attributes that asynchronous computer-based learning offer for this form of learning. In this application, the use of simulated conversations meets pragmatic levels of learning, as does the ability for consistent and safe drill and practice of these social skills. Holsbrink-Engels (1997) affirms that computer-based role-playing enhances learning of interpersonal skills (p. 164). However, to answer the above question, a look at current attempts for computer-based delivery for interpersonal skills instruction must be considered. These attempts include the numerous commercial products for interpersonal skill development developed internally by training departments with the advent of development toolkits such as HyperCard, Authorware, Flash, and Toolbook II. The list of programs also includes

those created by development companies such as Ninth House Network, NETg, Harvard Business School Publishing, DDI, SmartForce, SkillSoft, and SimuLearn, just to name a few. However, in this review four critical studies highlight the technology from the late 1970's through the late 1990's in conjunction with more contemporary research around media and animation.

Weller and Blaiwes Study

In the first study by Weller and Blaiwes (1977), computer-assisted judging and feedback is investigated on how media impacts learning. The research occurred through the Naval Training Equipment Center in Orlando, Florida in conjunction with the Human Factors Lab. The goal of the research was to reduce costs and difficulties associated with providing adequate feedback to student's interpersonal performance in simulated or actual job situations. One of the more popular approaches to provide feedback for this environment are videotaping the student's performance in interpersonal situations and to rate performance with feedback provided (Weller & Blaiwes). The results of this study concluded that a variety of computer-enhance programs can enhanced interpersonal skill training (Weller & Blaiwes).

This Naval training originates with a taping-feedback-training design model that involves videotaping the student in an actual job environment, rating the performance based on established standards for the job level, offering the student feedback, followed by training for skill enhancement (Weller & Blaiwes, 1979). The purpose of this study was to use a computer-based program to support the rating system of performance. Studies have looked at the use of videotaping sessions for interpersonal skill development. In a meta-analysis by Cronin and Cronin (1992) on the pedagogical effects

of interactive video in interpersonal skill areas, the research found that interactive video instruction (IVI) is more effective and less costly across a variety of instructional settings and objectives. Schaffer and Hannafin (1986) considered the attributes of IVI and found that with high school students IVI offered higher recall scores on content. In all of these studies, the concept is reinforced that the message is more critical than the medium to achieve superior results (Cronin & Cronin). One significant finding is that IVI used in soft skill areas has pedagogical advantages although not due to the additional learning time possible as found in asynchronous learning (Cronin & Cronin). The meta-analysis by Cronin and Cronin reports that other variables make IVI an effective learning medium, such as user's prior knowledge, ability level, learning style, attitude toward instructional delivery systems, experience with the technology, and motivation to learn (p. 68). The study by Weller and Blaiwes (1977) also reinforces these findings.

Weller and Blaiwes (1977) focused their efforts on an interpersonal skill rating method using videotaped models of expert performance. The rating system reflects three levels of variables: *global, skill, and behavioral* (Weller & Blaiwes, p. 11). The student target audience was Navy recruit company commanders (CCs) in interactions with their recruits. The experiment used a Nova 3/12 minicomputer, a Sony cassette videotape player, a Sony TV monitor, and Tektronix display terminal, and a Data General printer. The hardware was set up so that the computer could control the functions of the video player. The learners viewed the scenarios and provided decision-based responses via the computer with the print media providing data output. The role-play scenarios and ratings evaluate the medium as a rater of interpersonal skills and generate discussion in instructor-led classes. The three variables measured during the study are reliability of the tool for rating performance, ease of use, and the usefulness of the ratings. The findings

suggest this approach supported ease of use and offered usefulness of ratings; however, reliability cannot be significantly determined (Weller & Blaiwes). This first study helps define key factors for consideration in the furtherance of this research effort and possible instructional model. One key element is the value of using both video-based media along with effective rating systems to enhance the use of role-play learning. The use of independent mediums with credible content makes it easier to admit deficiencies and to achieve self-regulation of behaviors (Weller & Blaiwes, 1977). The research on video- and computer-based role-play strategies is further analyzed in the Schroeder (1986) study by the Army.

Schroeder Study

The Videodisc Interpersonal Skills Training and Assessment (VISTA) project was developed by the Army Research Institute's Fort Benning field unit (Schroeder, 1986). The project used computer-assisted leadership training to reduce high personnel costs associated with center assessments and simulation. The research effort addressed the following elements: topic analysis, hardware selection, software development, scenario writing, studio production, editing, and videodisc mastering. The final evaluation of the VISTA videodiscs included two tests, one designed to measure the acquisition of leadership skills, and the other designed to measure user acceptance (Schroeder). The evaluation of the scenarios indicated that the videodisc method resulted in significantly greater learning of leadership principles with the majority of students reporting that the use of a combination of videodisc and role-playing would be optimal for leadership training (Schroeder).

The VISTA project occurred in three stages including analysis and design, content development, and evaluation. In the first stage, a front-end analysis involved defining 57 candidate interpersonal problem situation topics rated by 58 subject matter experts (Schroeder, 1986). The second phase was the development of scenarios from Army manuals on leadership and counseling, subject matter experts, and theoretical approaches to counseling and leadership. The third phase involved evaluation of the scenarios to assess both learning of the leadership principles (Level 2) and the student's acceptance (Level 1), based on Kirkpatrick's Levels of Training Evaluation (1994). This study did not address Level 3, or skill application on the job, or Level 4 involving the impact or return on investment for this target audience.

The target audience was Army junior officers in the Infantry Officer's Basic Course at Fort Benning, Georgia. The preceding format for training leadership and counseling skills with this target audience was the use of conventional methods, highlighted mostly by role-plays. The first phase included selection of hardware and software using an Apple2+ computer, a DiscoVision videodisc player, and a Sony monitor. The software used Pascal with two navigational modes, the Experimental mode and the Pedagogical mode. The Experimental mode allowed for the learner to experience interpersonal related scenarios while watching the videodisc and responding to on-scene scenarios with the application of a light pen. The sequence of the scenario involves background information to set the stage, a video segment with the scenario subject speaking towards the learner via the video segment, and the learner receives prompts on-screen with decisions for interpersonal response to the subject. The selection of a response prompts the program into a maximum of ten branching videotaped sequences (shot from the officer's perspective) until the scenario is resolved or not (Schroeder).

The Pedagogical mode allowed for extensive video and textual feedback and re-entry into the program scenarios (Schroeder).

The study involves a statistical analysis of the results on performance and acceptance of the program delivery mode that supported learning. A Leadership Principles Test administered with criterion measures taken by independent raters, and a subjective measure of preference using a preference inventory evaluated the sample size of 312. An Analysis of Variance was used on all raw scores and the statistical analysis for the Leadership Principle Test via the Newman-Keuls multiple comparisons test showed a significantly superiority in achievement with the Videodisc over both conventional methods, instructor-led role-play and text-based learning based on the media attributes of content area ($F(5,294) = 8.147$, $P<.001$) and content area interactions ($F(10,294) = 4.633$, $P=.01$) (Schroeder, p. 38). The subjective performance ratings indicated a statistically significant preference for both Role Play and Videodisc over text [Newman-Keuls, $P<.001$] (Schroeder, p. 41). The preference test indicated the mode that most effectively kept their interest was 54 percent instructor-facilitated role-play, 46 percent Videodisc, and two percent chose text (Schroeder, p. 41). In an effort to exclude the possibility of a media comparison study, the researchers applied the identical raters for course evaluation and followed the scenario design applied in both formats. The researcher noted that the purpose was not to compare or replace instructor-led role-plays with the videodisc technology but to supplement the delivery medium as a potential refresher course (Schroeder, p. 42). Conclusions resulting from this project indicate that videodisc technology effectively teaches interpersonal skills (Schroeder). The researcher (Schroeder) defined five novel features that contributed greatly to the learning experiences: Including constructed responses, including a preview of the answer,

allowing the opportunity for studying other alternatives after making a choice, delivering precise feedback immediately following a response, and reinforcing content with textual feedback. The use of computer-based role methods to teach interpersonal skills continues in the 1993 developmental research of the Guided Social Simulation by Kass.

Guided Social Simulation Study

As noted in the development of a computer-based social skill module called Guided Social Simulation (GUSS) by Kass (1993) learners already possess interpersonal skills. This form of training defines what old skills to discard, what old skills to keep, and what new skills to apply. The interface used for GUSS involved an online coach, skill credibility statements by participants and experts, and the opportunity for reflection and elaboration (Kass, 1993). The GUSS module emphasized the opportunity for participants to practice social skills without the cultural and professional risks of face-to-face. This concept of safe rehearsal of interpersonal skills is addressed through a concept called, a "psycho-social moratorium" (Gee, 2003). The definition of a psycho-social moratorium principle is, "learning where the learner can take risks but real world consequences are lowered" (Gee, 2003, p. 62). The introduction of these learning attributes for computer-based simulations are reinforced by Holsbrink-Engels (1997).

Holsbrink-Engels Study

In the final study evaluated for this review, Holsbrink-Engels (1997) found a conversation model significantly improved college students' performance in computer-based role-play, which measured the number of messages sent by the protagonist role as shown in Figure 9 and their performance on a knowledge test as shown in Figure 10.

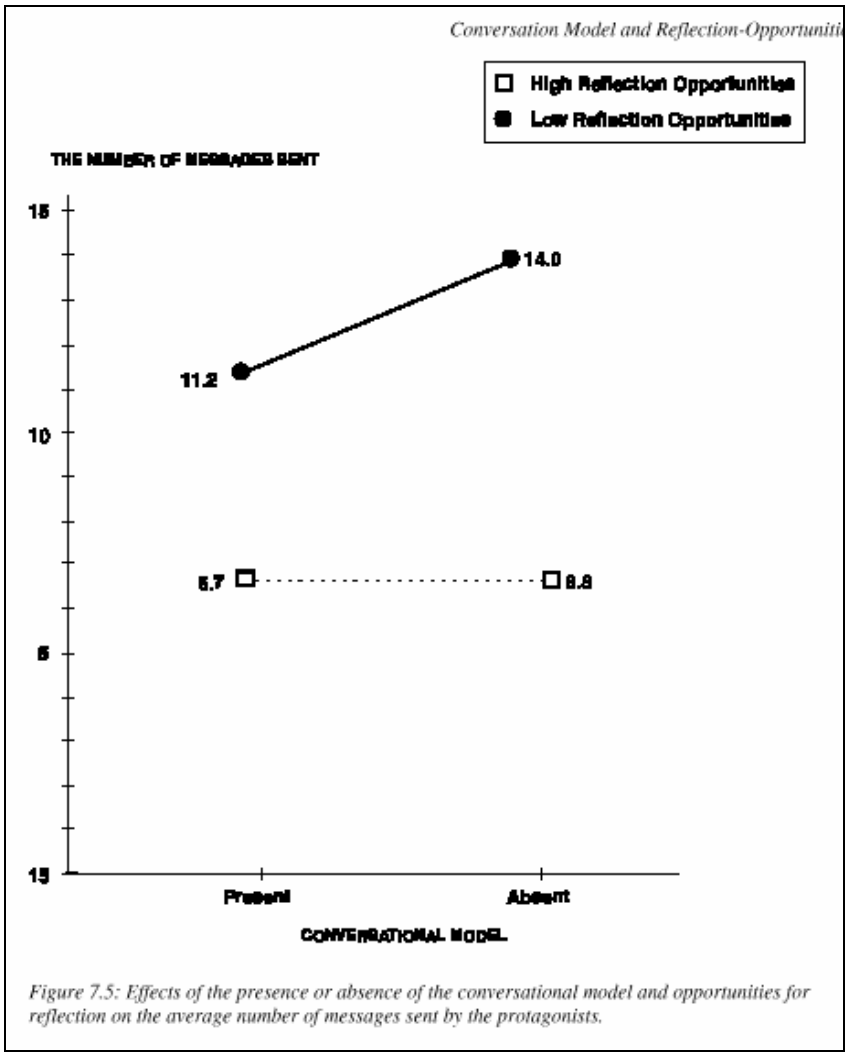

Figure 7.5: Effects of the presence or absence of the conversational model and opportunities for reflection on the average number of messages sent by the protagonists.

Figure 9. Effects of conversational model and reflection on number of messages sent by protagonists in role-plays (Holsbrink-Engels, 1997, p. 139).

When learners were provided opportunities for reflection, the students' performance in role-plays and achievement on the knowledge test improved even more, $F(4,91) = 2.69$, $p < .05$ (p. 121). The ability to reflect and make corrective actions does not exist in real-life interventions. The ability to reflect and adjust behaviors represents enhanced opportunities (Figure 10) for the learner to use computer-based role-plays for the development of interpersonal skills.

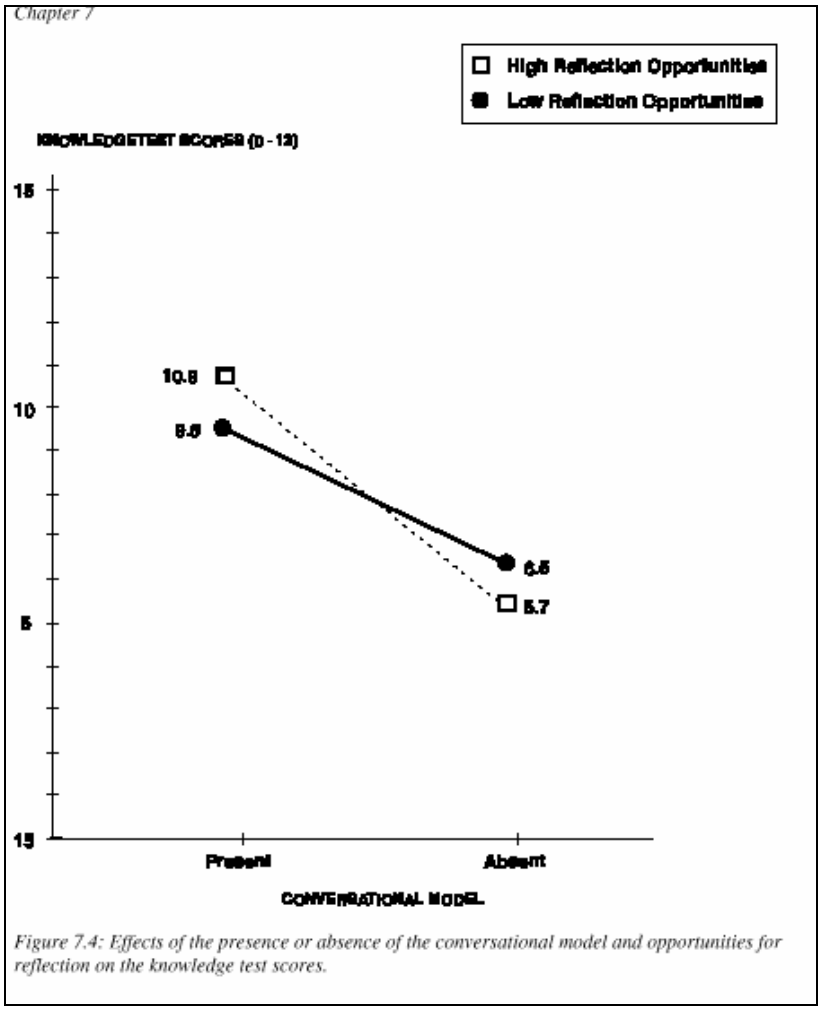

Figure 10. Effects of conversational model and reflection on knowledge test scores (Holsbrink-Engels,1997, p. 141).

The ability for students to reflect on the role-play experience is relevant to the application of an effective debriefing. Typically, the learning events involved in the use of role-plays debrief by asking the simple question 'What happened during the event?' However, an instructor's debriefing of a role-play event involves the questions 'So what does it mean?' and 'Now, what will you do differently?' Without the opportunity to reflect on the role-play experience the learning would not support the development of mental modeling or schema construction for future social-communication interactions. The two innovative design strategies, a conversational model and opportunities for

reflection, indicated that achievement was significant while allowing for the construction of mental models for skill comprehension and transfer. Holsbrink-Engels' use of the heuristic conversational model allows for social-communicative problem solving to support novice learning, to ensure consistency of the content, and to support those constraints created by cognitive overload. In addition, the use of reflection opportunities removes the constraints of time pressures and errors that occur in real-life interpersonal scenarios by reducing the complexities found in actual problems (Holsbrink-Engels).

Conclusion from Studies

Although these studies are not exclusive, they relate to interpersonal skill development and computer-based applications. The Weller and Blaiwes (1977) established the value of computer-assisted judgment of performance and feedback systems. The study achieved this with videotaped models on expert performance and effective rating systems (Weller & Blaiwes, 1977). In the VISTA project, the use of videodisc blended with role-play scenarios represented a preference by learners based on key elements such as response-active learning, previews of answers, alternative paths, feedback systems, and reinforcing content (Schroeder, 1986). Kass (1993) and Gee (2003) denote the effectiveness of providing a culturally safe place to practice social skills and to reflect on the effectiveness of their application. In addition, the final study by Holsbrink-Engels (1997) established that computer-based role-plays could enhance learning when applied with a conversational model and opportunities for reflection. The use of effective learning strategies, based on the findings in these four studies, support the design of an effective computer-based strategy. This research reports on the use of

simulations, computer-mediated communications or virtual communities, and design strategies for computer-human interface.

Designing an Asynchronous Solution

As shown by the three studies reported here, the use of computer-based learning strategies applies effectively to evaluation-based learning. The tools offer effective attributes for judging and feedback with the support of video (Weller & Blaiwes, 1977), the ability for learners to achieve mastery through active learning with decisions and cognitive reflection made through online alternative choices supported by immediate feedback (Schroeder, 1986), the applications of conversational models with opportunities for reflection for cognitive structuring (Holsbrink-Engels, 1997), and the providing a learning environment replicating a "social moratorium" (Gee, 1993). It is the goal of this literature review to further the definition of effective asynchronous design and delivery strategies to enhance interpersonal skill development.

Asynchronous learning and other methods should focus on those differences that impact a student's ability to learn (Spiceland & Hawkins, 2002). The ability to provide learning in separate places and separate times without real-time involvement by the instructor remains a key advantage of asynchronous strategies. In an educational environment, asynchronous learning seeks learning without the common elements found in conventional college courses: unity of space, time, and sequential actions (Spiceland & Hawkins, p. 69). The challenge of the designer/developer is offering instructional opportunities and motivation to engage the learner actively as opposed to passive engagement (Spiceland & Hawkins). The challenge for computer-based learning is to allow for feedback and reinforcement to fuel learner motivation (Spiceland & Hawkins).

Some of the more difficult hurdles in online courses are anxiety from the lack of time, space, and action (Edelson, 1998). The ability to manage information and engage learners at a distance through computer-mediated communication tools and hypermedia-based interactions makes the learning more individualized. This opportunity offers learners the chance to become involved without precipitating social pressure for responses, if learning styles can adapt or fit this instructional model (Spiceland & Hawkins).

Learning through interactive methods can increase motivation, promote collaboration, develop persistence in problem solving, allow for more depth of understanding, and increase the ability to explore (Harlamert, 1998 , p. 7). The design focuses on maximizing chances for referential connections for learning to occur (Mayer & Moreno). This design approach should consider the concept that multimedia learning occurs through learner processing in multiple channels (Mayer & Moreno). Goldman (1991) denotes a general instructional prescription derived from computer-based learning that, "the format in which materials are presented should do as much of the extraneous work for the learner as possible" (p. 335). Presentation formats should not require the learner to focus on the delivery and interactivity tools but focus on the content (Campbell, 1995). This statement signifies key applications for a computer-based or web-based module to offer user-friendly navigational options, accessibility, and clear objectives of a learning path. The interface and aesthetics of an interactive learning module are only part of the definition of an effective learning module, the strategy for learning is essential.

Levie and Dickie (1971) establish several key premises for learning relatable to multimedia and elearning development. One significant element that they define is that

almost anything can be taught to literate learners using printed text and illustrations, or that there is no significant difference in the results of a class instructed with varied mediums or media. Levie and Dickie make recommendations that pictorial media be used for concrete learning concepts, that print media works best for abstractions, and that film and video support learning involving motion and change. Levie and Dickie continue to say that pictures are superior to words as stimulus items in paired associate learning. The research also indicates that people have an extraordinary recognition memory for pictures due to more cues for recall and recognition (Levie & Dickie). The sensory modality of learners relates to the concept of dual-coding visual and auditory channels (Levie & Dickie). The auditory channels are sequential in nature and visual channels are spatial, which supports the use of text in multimedia to ensure comprehension. Simultaneous bimodal presentation of redundant information affords no advantage over a unimodal presentation because all information must pass through a sequential utilization system (Levie & Dickie). Some other findings by Levie and Dickie on signs and senses include the effects of time, that when learners can take as much time as they wish learning is enhanced. Finally, feedback does not help with correct answers as critically as supporting learning with incorrect answers (Levie & Dickie). The assimilation of these findings supports the effective design of an asynchronous module.

Mayer and Moreno (2002) build their research findings around the concepts of dual-coding theory and cognitive load theory. The concerns by Mayer and Moreno with dual processing of visual and auditory presentations and the potential for cognitive overload in working memory becomes the basis for the following five principles on multimedia design and user interface. These five principles in Table 1 support the design of elearning modules (Mayer & Moreno, pp. 5-8).

Table 1

Five multimedia design principles (Mayer and Moreno, 2002, pp. 5-8).

Multimedia Aids	**Contiguity Aids**	**Coherence Aids**	**Modality Aids**	**Redundancy Aids**
Multimedia presentations result in deeper understanding than single medium presentations	Two presentations of the same content spaced in time are better than one (Information Delivery Theory)	Presentations delivered in concise group format did better than embellished group	On screen text and auditory narration of same material serve same purpose	Providing narration and animation support learning in dual channels, adding text as 3rd modality offers no supplemental learning

The key findings that Mayer and Moreno (1999) defined were that "simultaneous presentations of material offered deeper learning than successive presentation as measured by superior problem solving transfer scores with a median size effect of 1.30" (p. 112). Information delivery theory defines that on-screen text and spoken text both serve the same function of delivering the same information to the learner (Mayer & Moreno). In Mayer's (1999) research showed redundancy when animation-narration in one group and narration-animation-text in a second group established that both text and animation provided visual processing. The animation and narration group did better with a median size effect of 1.17 showing a strong and consistent effect (Mayer & Moreno). The application of these findings must be aligned with current solutions such as scenario-based learning and simulations as asynchronous instructional strategies.

Scenario-based Learning

A key strategy for instructing interpersonal skill development is scenario-based learning modules, which might include computer-based role-plays and interactive simulations. Kindley (2002) notes that:

> A central tenet of this philosophy is that changed performance is a function of immediate and tangible rewards received for successful behavior. A sophisticated

> chain of psychological events occurs from the initial phases of learning about a subject to the internalization of habitual behaviors required for successful interaction of a learning scenario. These reinforcements must be woven into the fabric of the learning experience. (p. 2).

In any actual environment where learning is applied, learners gain a given level of proficiency where change in performance is a function of the ability to interact with others in social situations (Kindley). Scenario-based learning offers learners the chance to experience social and psychological events, based on the concepts of situated cognition, if the environment connects with the design process (Kindley).

The use of scenario-based learning involves more complex learning and more complex design strategies with a focus on teaching flexibility in application of the content (Bransford, Brown, & Cocking, 1999). Bransford et al. further state:

> When a subject is taught in multiple contexts and includes examples that demonstrate wide application of what is being taught; people are more likely to abstract the relevant features of concepts and to develop a flexible representation of knowledge (p. 9).

Establishing an interactive learning environment, as noted by Jaffe (1997) and weaving the need for intellectual challenges (Kindley, 2002) helps establish a need for scenario-based learning in an asynchronous module for interpersonal skills. The use of computer-based role-plays can enhance interpersonal skill development (Holsbrink-Engels, 1997). In the following section, a look at how simulation design and implementation supports learning in a computer-based environment is considered.

Current Computer-based Solutions for Interpersonal Skill Development

An overall perspective of the professional training and development industry is helpful to understand where computer-based solutions currently exist and where they are going. According to the ASTD 2003 State of the Industry Report, training expenditures are up for benchmarking service organizations from 1.9 percent in 2001 to 2.2 percent in 2002 (Sugrue, 2003, p.2). The delivery by learning technologies increased to 15 percent in 2002 with a projected increase in 2003 to 19 percent (Sugrue, p. 2). Current learning technologies continue to show higher use of CD-ROM delivery methods over online and other methods. The ASTD 2003 Annual Report indicates that in benchmarking service organizations 47 percent of technology-delivered training delivers in a stand-alone mode via CD-ROM than online-networked programs at 32 percent (Sugrue, p.19). The use of computer-based and online learning methodologies and technology continues in a dynamic state based on global issues such as economic changes, technological advancement, and changing philosophies of epistemology. The changes in learning philosophies and tools for accomplishing learning demand an understanding of common terminology used in the area of professional development and education.

The use of visual graphics, animations, and video with supporting text effectively represent the Contiguity Principle (Clark Mayer, 2003). Some of the leading programs apply the use of conversational models to support learning of interpersonal skills as shown in Figure 11.

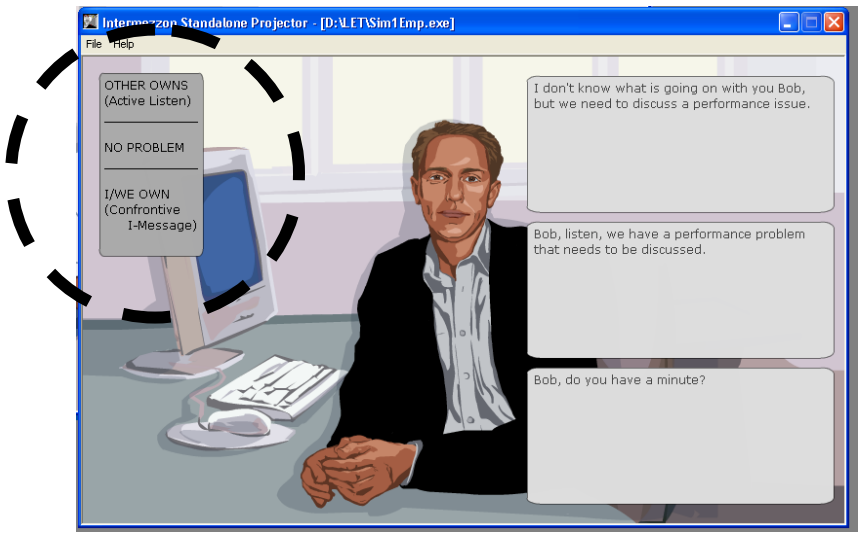

Figure 11. Example of conversational model in LET Review Module simulation . *Flash animation used with permission from Intermezzon*

The use of an onscreen conversational model allows the learner to focus on practice with opportunities to reflect upon the model prescribed in training or as part of the online content. The application of animated models used simultaneously with audio-based instruction effectively applies the Multiple Representation Principle with use of words and pictures. As in the case of one development company, Ninth House, the modules apply the use of both CD-ROM applications in conjunction with an online administrative capability. The system allows for effective testing of the media with the individual PC and avoids bandwidth issues through the "hybrid" approach of media retrieval from the CD-ROM.

The instructional design of modules uses many effective learning strategies such as periodic comprehension testing with short online quizzes. The tests for comprehension should include feedback provided through either visual and audible media or textual and auditory media, but not all three as defined by the Redundancy Principle (Clark & Lyons, 1999). The use of animated figures as coaches during quizzes, online discussions, or reflection opportunities reflect high-level programming and engage many

of the senses. The use of multiple mediums to offer this feedback can conflict with the Redundancy Principle from a cognitive processing perspective if either dual processing or extraneous elaboration occurs (Clark & Lyons). The use of a conversational tone and pedagogical agents, or coaches, can increase learning according to the personalization principle (Clark, 2002, p. 6). In addition, the use of effective instructional design practices allows for reflection opportunities with printable discussion tools and interactive practice simulations. Learning is influenced by situational factors such as social climate, physical features and attributes, and mediating agents present during the initial learning (Chiou, 1992, p. 57). The interactivity and authenticity of the experience support learning with the use of simulated practice sessions.

Simulations

Simulations incorporate experience from many levels including informational, structural, systems, and emotions (Parks, 2002). In simulations, learning is dependent on character reaction and the user's interface with the learning environment (Aldrich, 2004). Aldrich states that, "simulations are tools that allow users to learn by practicing in a repeatable, focused environment" (p. 243). Powell (2001) notes that, "the best simulations promise to provide something lifelike, new, and a chance to practice, practice, practice" (p. 36). Online or computer-based simulations allow learners to immerse themselves into the experience allowing the chance to practice, reflect, and implement new approaches based on feedback and learned content. One purpose of the use of any simulated or computer-based role-play is the conversion of tacit knowledge into explicit knowledge (Rudestam & Schoenholtz-Read, 2002). Rudestam & Schoenholtz-Read continue to define tacit knowledge as personal knowledge born from

personal experience that is hard to communicate. Rudestam & Schoenholtz-Read note that, "explicit knowledge is codified in some way so that it can be transmitted in formal systematic language (p. 304). The authors suggest that, "once an individual has made his or her tacit knowledge explicit; the individual can analyze it, refine it, and adapt it to other uses" (p. 305). The ability for simulated scenarios, or role-plays, to bridge tacit knowledge with explicit knowledge depends on an effective design.

The design of simulations, or scenario-based events, follows a consistent learning model called Full Cycle Learning (Aldrich, 2004). The Full Cycle Learning begins with a 1) goal, 2) plan, 3) experiment, 4) feedback, 5) update, and 6) understanding (Aldrich, p. 85). This model parallels the learning model applied with computer-based role-plays (Holsbrink-Engels, 2001). In her research, Holsbrink-Engels highlights that computer-based role-playing should follow six stages: 1) introductory computer screen with pictures showing the environment of the scene; 2) a text-screen with a description of the social situation; 3) a text-screen with a description of the role; 4) a dialogue-screen for role-playing; 5) a print-screen to make a printout of the dialogue; and 6) use of the printout for debrief the dialogue. Within this model approach, Holsbrink-Engels achieves a similar level of learning through experimenting and receiving feedback via the printed dialogue. The debriefing supports updating the skilled behaviors toward mastery and comprehension. This cyclical content develops muscle memory at the interface level (Aldrich). The interface must line up with the actual task or learned skill for optimizing the transferability of skills (Aldrich).

The use of simulations for interpersonal skill training would reflect what Aldrich (2003) refers to as experiential simulations, within which the sub-group of social-process simulations are based. These simulations allow learners to, "interact with real-world scenarios and experience the feelings, questions, and concerns associated with that particular role" (Aldrich, p. 573). Simulations allow users to learn by practicing in a repeatable and focused environment. Simulations support the development of mental models at the interface level, if the interface does not line up with the real task at this level the transferability of skills will be insignificant (Aldrich). In a recent developmental project for SimuLearn, author and designer Clark Aldrich developed an interactive simulation entitled *Virtual Leader*. The simulation applied leadership concepts, including interpersonal skills, within a three-dimensional game-like business-meeting environment. The program description applies many of the same concepts discussed in this section (Aldrich, 2003). A strategic approach to learning is applied with the use of an avatar character managing relationships and goals during a simulated executive business meeting. This approach raises questions on fidelity and social presence for online simulations and the future of this form of training.

Fidelity of Animated Simulations.

The use of videos or pictures generates a question on the levels of realism versus abstraction necessary to complement learning of interpersonal skills. Many of the current modules apply scenario-based simulations with graphic photographs to represent contextually based situations faced in the workplace. The use of iconic presentations, relevant to the knowledge, or digital presentations, not relevant to the knowledge, have become a selective design strategy that can impact learning (Levie & Dickie, 1973). The

choice of iconic signs, concerning levels of realism, must consider that pictures interfere with learning due to distracting stimuli and can contribute to cognitive interference (Levie & Dickie). One critical decision element supporting the use of realism versus abstraction is the pace of the presentation.

The use of animated characters or agents involve the consideration of four elements for this level of fidelity: overload, transfer, effect, and costs (Reigeluth, 1989, p.2). Reigeluth continues to say that a good design begins with low fidelity and advances with higher learning (1989). The application of this software approach addresses the four elements significantly. Hannafin and Rieber (1989) state "evidence from familiar and realistic images may reduce perceptions of the effort needed to process information, thereby, reducing the depth with which instruction is processed" (p. 107). Lee and Nash (2003) denote "low-overhead agents can be easily produced and can generate a wide range of social responses; the use of full video may be overrated" (p. 228). Reeves and Nass (1996) continue this evaluation of animated characters and computer-based personalities through denoting that most of our visual fields are peripheral vision, which has limitations. Reeves and Nass continue to note that few visual experiences depend on perfect visual fidelity. This finding was determined through research involving the measurement of three responses (attention, memory, and evaluation) while participants observed media-based images. Based on these findings, Reeves and Nass denote, "motion does not have to be dramatic to indicate life in animated characters" (p. 226). The use of animated characters provides a cost effective learning strategy that does not limit social presence and could positively impact cognitive overload. In an online simulation web-conference Sivasailam (2004) stated "interactivity is in your mind not in

your mouse". In regards to fidelity, the use of high-end video branching models can engage and offer high levels of acceptance through social presence.

Social Presence.

Lee and Nash (1999) suggest, "Two types of variables exist that impact social presence, media variables and individual differences" (p. 290). This level of technological presence occurs from the following media variables: number of sensory dimensions and channels presented; image quality; image size; narrative quality; production techniques; sound fidelity; and presence of other people or agents in medium (Lee and Nash). Lee and Nash posit, "The primary characteristics of media that seem to cue these social responses are the use of language, interactivity, and voice" (p. 290). Reeves and Nass (1996) denote "human-computer interaction is fundamentally social and perceptual in exactly the same ways all other interactions with people and the physical world are social and perceptual"(p. 67). The use of media attributes indicates that low-overhead agents can be easily produced and can generate a wide range of social responses; the use of full video may be over-rated (Reeves & Nass). Finally, the use of technological strategies can afford many imaginative and innovative methods for rehearsal and practice (Rieber, 1990). Rieber continues by stating, "research has found that learners were able to learn inductively from structured computer-based instructional simulations" (p. 369).

Summary on Computer-based Learning for Interpersonal Skills

The overall factors guiding computer-based and online learning initiatives are instructional methods and instructional media. The instruction, within an asynchronous module, should follow three critical paths to achieve post-instructional reinforcement and

evaluation goals. These paths consist of pedagogical, technological, and environmental for an effective instructional process. The pedagogical approach applies the use of effective design, development, and delivery strategies and tools to support the learner and learning. The technological applies the asynchronous tools and multimedia interface design principles necessary to significantly impact learning in interpersonal communications. The instructional approach for teaching interpersonal skills parallels conventional methods with scenario-based learning or role-plays.

The use of asynchronous technology to support this learning approach will build from the findings of Weller and Blaiwes' (1977) use of computer-assisted judging and feedback, Schroeder's (1986) use of videodisc technology to effectively teach interpersonal skills, Kass's (1993) interface for reflection and elaboration, and Holsbrink-Engel's (1997) use of conversational models and opportunities for reflection. These components synthesize with the findings on multimedia interface design by Mayer and Moreno (2002), Clark and Lyons (1999), and Mayer and Clark (2003) to support the design of an asynchronous model for interpersonal communication development. Some of the elements that affect this form of learning are computer-mediated communication tools and the development of virtual communities for learning. These social communities are deeply ingrained conventions of social interaction that tend to exert themselves unconsciously in human-computer interactions (Clark, 2002). The development of the learner through motivation and self-regulated learning are instrumental for the success of offering interpersonal development learning through computer-based or elearning opportunities. Reeves and Nass (1996) identify that the use of lower level visual agents or characters is supported by the premise that less encoding, as in a video, effectively manages cognitive limitations.

Philosophical Foundations for Learning

This section evaluates relevant concepts, principles, and theories from the behaviorist, cognitive, and constructivist learning philosophies. The application of these findings apply to the design and development of post-instructional learning modules for interpersonal communication.

Overview of Learning Philosophies

The history of learning philosophies traces back to the philosophical roots of Aristotle and Socrates concepts on memory and the teachings of free will by St. Thomas Aquinas in the 13th century (Bransford, Brown, & Cocking, 1999). John Dewey's work on *"learning by doing"* in the 1900's serves as a key contribution to the Behaviorist perspective, as well as predictable behavioral research by Thorndyke (1932) and Skinner (1968). In 1913, the Behaviorist Movement is defined by John B. Watson's statement that, "…consciousness is neither a definable nor a useable concept; that it is merely another word for the "soul" of more ancient times" (Bransford, Brown, & Cocking). This representation indicates the value placed on conditioned responses to environmental stimulus in the use of knowledge. The Cognitive Revolution began in 1956 from the research of George Miller, and papers presented at M.I.T. by Newell and Chomsky. Led by Jerome Bruner, the implications of cultural participation came to life in the 1990's and continue with some debate. The phases of development for these discourses on cognition can be viewed in Figure 12.

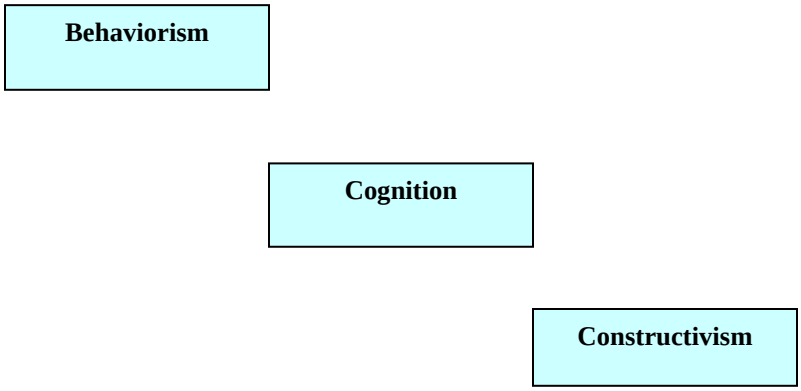

Figure 12. Evolving perspectives on learning (Magliaro and Wildman, 2002).

The field of instructional technology applies theoretical foundation from three discourses on learning: behaviorist, cognitive, and constructivist. An overview of each philosophy and its implications for computer-based learning initiatives is the focus of this section with cognitive discourse addressed at the end due to relevance to this project.

Behaviorist Perspectives

Behaviorism's foundation is comprised of positivism, animal psychology, and functionalism (Link, 2002). A behaviorist perspective views knowledge transfer from the outside to the inside as illuminated by Skinner's research. Skinner's sees the brain processes as that of a switchboard managing knowledge through the senses via stimulus-response and strengthened by a reinforcer (Skinner, 1968). The focus by Skinner expanded beyond classical conditioning with determinations of his stimulus-response-reinforcement paradigm, reinforcement schedules, and behavior modification (Sinatra, Reynolds, & Jetton, 1996). Skinner's work became an extension of Thorndike's Law of Effect, where individuals do what is pleasant and avoid situations that are unpleasant (Thorndike, 1932). The contributions by Thorndike led to four primary contributions: 1)curriculum design based on social utility; 2)objectives and measures; 3)use of

educational settings for research; and 4)breaking complex acts into simpler ones (Lashbrook, p. 9). A key finding by Thorndike (1932) led to behaviorist applications for today's learning challenges based on the concept of learning simpler behaviors as prerequisites for more complex skills. These skills frame much of the conceptual framework of instructional design applied today through the shaping of knowledge. Gagne (1978) identifies the use of sets of hierarchical prerequisites consistent with the behaviorist beliefs on social modeling.

According to social learning theorists psychological modeling provides the following benefits for learning as seen in Figure 13.

1. Modeling informs learners.
2. Enables learners to discriminate facts.
3. Offers learners incentives to learn.
4. Extinguishes or elicits emotional responses.

Figure 13. Key benefits for behavior modeling (Lashbrook, 1976, p.14).

Lashbrook states, "The modeling process is almost unavoidable in instruction" (p. 15). The elements of psychological modeling are one of the key attributes of behaviorist research supporting the theme of this study. These foundations of behaviorist research support the types of learning defined by Gagne, Briggs, and Wager (1988). It is this concept of mastery of prerequisite learning that emphasizes individual differences and the need for remedial work and individualized instruction (Lashbrook, 1976). The advocation of incremental learning, with the goal of predictable outcomes, represents a key contribution toward complex learning issues by the behaviorists relevant to this study. Gagne's (1978) concept of connecting chains of prerequisite learning connects

with problem solution. Similarity of stimulus, or chained behavioral connections, supports transfer from one setting to another (Burton, Moore, & Magliaro, 2003). Burton et al. denotes transfer requires strength of stimuli associations, mental cues, and drill and practice with supportive feedback. These elements prescribe the design process adherent toward the complex problem-solving skills of interpersonal skill development.

Constructivist Perspectives

Jerome Bruner (1990) was a leader in the Constructivist Movement, which highlights the span of "cultural participation" perspectives. The concept is not new, going back as early as the early 18th century with studies on constructed knowledge and the works by Vygotsky (1971). The application of real world and cultural effects on learning are the primary principles of this paradigm in thinking. Current practices in design and development with online media reflect this concept of real world and cultural influence. One example would be the use of simulations in online learning. Simulations can entail visual representations of real-world scenes or people to make the learning more contextual. Even online learning for software applications provides screen emulations parallel to how the end-user will apply the knowledge in a real-world environment. Jonassen (1997) contends a social constructivist approach to these types of activities. The results are deeper thinking and ownership assumed by the participant (Jonassen). In Bruner's Acts of Meaning (1990), he establishes that humans make meaning from the world through cultural reference and experience. Bruner further states, "people organize their experience and knowledge about and with transactions with the world" (p. 34). Bruner highlights this new movement by stating, "a focus that human action can not be fully accounted for from the inside out" (p. 105). In this statement, Bruner is reflecting

how our cultural experiences and environmental events shape our learning as well as our self. Bruner's work opens doors for a new revolution that focuses on the outside world and its effects on learning.

Embedding context from the real world into learning makes it more effective in human performance and action, but it also takes cognitive abilities to a higher level. The use of situated learning allows the learner to retrieve scripts, mental models, and templates for behavioral actions with more efficiency. Achieving higher levels of human performance becomes an issue of more developed cognitive templates to activate when environmental stimuli call upon action or problem solving. The use of these higher-level concepts is helpful in many facets of life but in performing interpersonal skills, these skills are critical. One example of this is when learners must adapt to changing situations. These variables will support a person's decision to make change and apply memory representations from networks of schemata according to Sinatra et al. (1998).

Hannafin, Hannafin, Land, and Oliver (1997) see learning complex skills, such as problem solving, being dependent on prerequisite lower order skills as Gagne viewed in 1968. These changes, according to the constructivists, are not based on absolute meaning for objects and events but the cultural interpretation that occurs around the events (Hannafin et al., 1997). One clear example of this is the use of the video Jasper by the Vanderbilt Cognitive Studies Group where the vignettes offer learner's contexts to interpret, reason, generate alternative approaches, and to develop and test new ideas (Bransford et al., 1999).

Cognitive Perspectives

One transition in thought that occurred during this period of the late 1950's was the contrast from John von Neumann's thinking of cognitive processing as a computer processor to resistance of the computer model, as defined by Ulric Neisser (1967). The development of cognitive science through researchers from Gestalt psychology, and those influenced by Gestalt like Tolman, Piaget, and Gagne's later philosophies. In the next section, *Concept of Knowledge* looks at how people acquire knowledge that provides key opportunities for linking cognition with real-world application. This section considers the concepts of knowledge, how it is constructed and how it is retrieved.

Concept of knowledge.

Acquiring knowledge, according to Norman (1978), involves three methods for acquiring learning as seen in Figure 14.

- *Accretion*-add new knowledge
- *Restructuring*-organize new knowledge
- *Tuning*-sharpen new learning

Figure 14. Norman's acquisition of learning (Norman, 1978).

In Norman's model, once knowledge is acquired through accretion, it must be processed in some manner to ensure storage and retrieval. Scaffolding involves support mechanisms for learning provided by the teacher to support the earlier stages of learning and restructuring. Examples of these might be cognitive strategies or models that support learning. In fading, the teacher would gradually remove these scaffolds in order for the student to begin conceptualizing the process or the problem. The teacher uses these

techniques to gradually offer critical confusion for the learner. This motivates the student to push for higher levels of problem solving and cognition. Some models provide more of the computer-processor concept such as Atkinson and Shiffrin (1968) dual-processing model. The concepts of low or high complexity further define that cognition is reliant on architectural stages of storage and activity. As Atkinson and Shiffrin stated, "a low level similarity cues transfer of a strategy from one situation to another, which he called low road transfer" (p.68). Atkinson and Shriffrin (1968) further stated that, "high road transfer is based on recognition structural similarity" (p.68). The view that knowledge processes at various levels of complexity requires some definition of how knowledge transfers and how constructs are necessary.

A sample of a learning activity applying these concepts of knowledge construction would be the use of online role-play practice sessions on interpersonal communications. Although simplistic, these practice sessions allow the participant to try different approaches and receive coaching on their performance. In cognitive construction, the skills develop for more effective and efficient response to other's behaviors. This skill is of higher-level construction implementing units of nodes, frames, schema, scripts, and mental models. Communication theory looks even further at these mental models through what Katherine Miller calls M.O.P.S., memory organization packets, as founded by Kellerman, Broetzmann, Lim, and Kitao in 1989 (Miller, 2002). These memory organization packets parallel studies of acquisition of knowledge through mental modeling, schemata development, and frames. As the online module learner selects choices and receives feedback, the program allows opportunities for both restructuring and tuning. Restructuring the knowledge is the process of making meaning out of the information and relating it to prior mental models. Tuning involves practicing

the responses until performance is efficient and effective. The series of skills required to perform interpersonal skills develop into scripts and mental models that provide automaticity and effective transfer of the models from LTM to action.

Memory and retrieval.

The ability to construct and reconstruct schemata, scripts, frames, and mental models is the focus of this section on memory and retrieval. The key to retrieval seems to be the connectedness of units of knowledge and information, whether through propositions or neural networking. Much of the research on memory and recall involves text-based propositions. Research has shown certain efficiencies in reconstruction allowing more effective retrieval, such as the MOPS in communication theory (Miller, 2002). Processing occurs with both parallel and sequential methods and varied levels of storage are necessary. "A sequential program can be defined as one that makes only those tests which are appropriate in the light of previous test outcomes. Viewed as a constructive process, it constructs only one thing at a time" (Neisser, 1967, p. 297). A parallel program by Neisser, "carries out many activities simultaneously, or at least independently" (p. 297) For the learner, this means that if constructed effectively, knowledge and performance can be enhanced. Hannafin and Oliver (2000) state, "personally relevant problem understanding emerges within an individually constructed mental framework" (p.5). Ausubel, Novak, and Hanesian (1968) define two basic distinctions for learning: 1) Learning occurs when materials are related to learners existing cognitive structure or prior experiences and 2) Learning material is anchored to meaningful learning and is nonarbitrary and relatable (p. 21). This perspective reflects the need for a flexible mental model, adaptable to many problems as is required for

interpersonal communications development. This mental model responds to the cognitive capacities available to the learner. It remains the role of the designer and instructor to ensure that a balanced design supports cognitive loads.

Cognitive load theory is concerned with the manner in which cognitive resources apply during learning and problem solving (Sweller & Chandler, 1991). Many learning and problem-solving procedures encouraged by instructional formats result in students engaging in cognitive activities far removed from the capacity of the task. The cognitive load generated by these irrelevant activities can impede skill acquisition (Sweller & Chandler). Sweller and Chandler found that worked examples support learning because they do not have cognitive overload. Clark and Mayer (2003) define that the effort by learners to make sense of presented materials through cognitive processing should not only present the message but prime the learner to call upon previous experience and social mental models. For this learning result, practice should be interspersed throughout the module. The practice becomes encoding that integrates new knowledge and skills with existing knowledge in LTM (Clark & Mayer). Through this practice, learners develop metacognition of how to learn complex processes and to solve problems (Hannafin et al., 2000). Miller (2002) suggests that the process of building models on a computer may provide direct support to the cognitive processes of constructing strong and accurate mental models. Dealing with complex social issues requires cognitive efficiency, mental structures, and an adaptive skill set based on varied types of problems.

Problem solving as a cognitive process

Jonassen (1997) categorizes problem solving into well-structured and ill-structured problems. He notes that well-structured problems are: constrained problems

with convergent solutions that engage the application of a limited number of rules and principle within well-defined parameters. Ill-structured problems are defined as, "possessing multiple solutions, solution paths, fewer parameters which are less manipulable, and contain uncertainty about which concepts, rules, and principles are necessary for the solution or how they are organized and which solution is best. (p. 65). Gagne (1985) regarded problem solving as the synthesis of rules and concepts into higher-order rules. The skills of interpersonal communication require the ability to handle ill-structured problems. This categorization is based on characteristics of ill-structured problems including emergent dilemmas, unknown problem elements, vaguely defined or unclear goals, unstated constraints, and multiple solutions (Jonassen). The challenge for novices to achieve effective ill-structured problem solving is that they do not have schema and must rely on general problem-solving strategies. This approach impedes schema development and efficiency of retrieval and application.

Summary on Philosophical Foundations of Learning

The characteristics of the learner include the learner's previous knowledge, contextual application, motivation, and attitudes. How the learning occurs is critical to its success, and how the learning provides chances to build on itself incrementally. Ritchie and Baylor (1997) state that, "Behaviorism provides the pedagogical basis for direct instruction, assistance with a step-by-step job aid, and immediate feedback" *(*p. 30). Constructivists emphasize that the context in which the learning occurs as well as the social contexts that the learners bring to their learning environment are critical to the learning (Bruner, 1990). The view that knowledge processes at various levels of complexity requires some definition of how knowledge transfers and how constructs are

necessary. One model that clearly defines this stage would be the cognitivist's perspective of Atkinson and Shriffen's (1968) dual processing model of sensory register, short-term memory (STM), and long-term memory (LTM). The cognitive capabilities exist that allow for "*expert performance*" with the development of mental models and effective conceptual bridging. Ill-structured problems involve more cognitive operations and working memory requirements that increase at least proportionally (Jonassen, 2000). These learning philosophies can support the development of a learning module that provides accretion, assimilation, or tuning of interpersonal skills (Norman, 1978). Mental models are realmed in behaviorist and constructivist influences, although predominantly a cognitive discourse. As this review begins its' look at transfer of skills and impact of learning, the efficiency of mental model development will play a key role in developing interpersonal communications.

Instructional Impact from Learning

The need for best practices in achieving and measuring learning outcomes remains a significant challenge. Empirical findings remain somewhat unavailable for learning outcomes in interpersonal skill development. A benchmark survey of U.S. organizations indicates that in 2002, only 17 percent of those organizations measured performance and skill transfer at Level 3. (Thompson et al., 2003) This study seeks to define a process of learning reinforcement that enhances comprehension and skill transfer for interpersonal skill development.

Measuring the Effects of Training

The use of class survey instruments for levels of learner acceptance and instruments measuring comprehension are the most common tools applied in training environments. Kirkpatrick's (1979) four levels of evaluation for training represent the most common system for evaluation levels as shown in Table 2.

Table 2

Kirkpatrick's four levels of evaluation (Kirkpatrick, 1979).

Level	Description	Typical Instrument
Level 1	Satisfaction	Self-reporting Survey
Level 2	Knowledge	Self-reporting Survey, Achievement Test, Simulations
Level 3	Application	Self-reporting Survey, Interview, Observation, Focus Group, 360 Degree Performance Analysis, Qualitative Data
Level 4	Impact	Evaluation of organizational documents, measures, Qualitative Data, Quantitative Data

Evaluation applies in formative or summative formats for training environments. Formative evaluation represents," the process of collecting data and information in order to improve the effectiveness of instruction" (Dick & King, 1994, p. 3). Summative evaluation is defined as, "the collection of data and information which can be used to make a decision about the acquisition or continuation of the use of instruction" (Dick & King, p. 3). Generally, formative evaluation is used in conjunction with ongoing instruction evaluation where summative is applied following the completion of instruction. In skill transfer, or *Level 3* evaluation (Kirkpatrick), formative strategies are necessary and the focus is on behavior (Dick & King). The consideration of *Level 3* connects the designer to the actual workplace in regards to instructional formation and

measure. However, many organizations choose not to measure training at *Levels 3 and 4* for various reasons.

The reasons for not measuring the impact of learning are based on issues of time, costs, or tradition. In many organizations, management is reluctant to waste time testing something accepted as an adequate or good program (Bell & Kerr, 1985). In some cases, the lack of skills or adequate tools for evaluation deters this important evaluative stage (Phillips, 1997). Cohen and Rustad (1998) define some of the reasons the higher levels of training evaluation are not applied are that: a) belief that training worked; c) high costs of evaluation; d) belief that better evaluations are not possible; e) concerns with risking failure through training; f) lacking methodological expertise; and g) clients do not demand it (p.10). The measurement of learning outcomes becomes even more complex and faces certain barriers in assessing interpersonal skills (Campbell, 1995).

Comprehension and Transfer

In studies conducted in 1932 , Sir E. Bartlett established noted, "That remembering depends upon active bias or special reaction tendencies awakened in the observer by the new material" (p. 85). Bartlett also established the learner's use of *"sympathetic weather"* which drives our memory through emotions, bias, and experience. Several key findings from Bartlett's work using his story *War of the Ghosts* are defined in Figure 15.

a) Words or phrases popular at the time of experience stand out.
b) Any words that appear comic will reappear during recall.
c) Material which is a direct or indirect stimulus to pre-formed interests reappears

Figure 15. Findings from Sir Bartlett's War of the Ghosts (Bartlett, 1932, pp. 89-90).

A few key issues surrounding these findings are that recall of information and comprehension of facts become linked to matter outside of the story (Bartlett). A second finding is that rationalization of the information integrates with individual interests. Bartlett's findings reflect that the influence of affective attitude may intensify with lapse of time and pose a strong bearing on recall and comprehension. Berge (2001) states, "Training has to do with the learners' acquiring knowledge, skills, and attitudes that are useful to them immediately to improve performance on the job" (p. 4). The effects of comprehension and time relate to the transfer of skills.

The transfer of learning and transfer of skill application often appear synonymous with each other despite their differences. Real knowledge involving learning in new ways (what is often called transfer) is distinguishable from knowledge that is based on recall and scripted use (Bransford et al., 1999). Bransford et al. reference Thorndike as the first to use transfer tests in 1901 to examine assumptions in the instruction of Latin. Thorndike's (1913) research hypothesized that the degree of transfer between initial and later learning depended upon the match between elements across the two events. Four key elements are found necessary to support transfer of learning as shown in Figure 16.

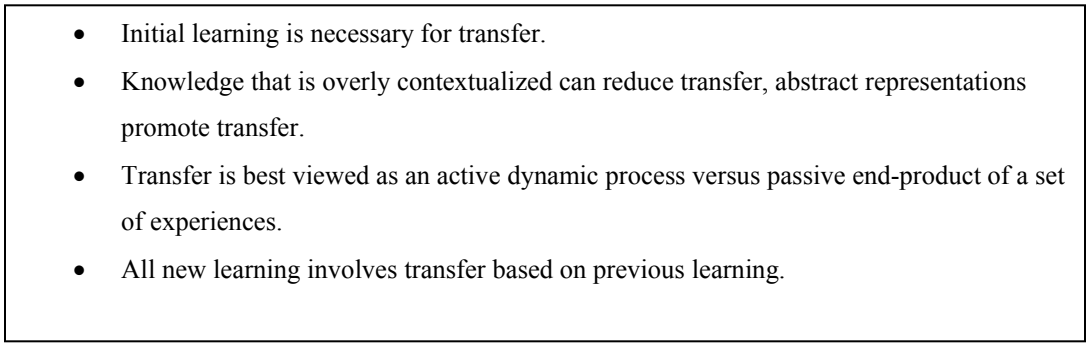

Figure 16. Four key elements for transfer of learning (Bransford et al., 1999, p. 2).

A number of critical variables impact transfer of learning such as mastery of the subject, comprehension of content, time to learn, feedback, motivation, contextuality, and reinforcement (Bransford et al., 1999). Bransford et al. note that transfer of learning is a function of the relationships between what is learned and what is tested. Transfer from learning to skill application is a function of the degree to which the tasks share cognitive elements (Bransford et al., 1999). Bransford et al. continues to note that with prompting, transfer can improve quite dramatically. The overlap of the definition of transfer of learning and transfer of skill application is fundamental in understanding how learning can translate into mental models that support complex problem solving. Transfer of learning occurs from previous experiences, abstract problem representations, and building from these representations to enable learners to adapt to complex domains (Bransford et al., 1999). It is also critical for the designer to understand the non-class environment for transfer of learning, termed as adaptive expertise (Bransford et al., 1999). The application of skills requires two types of learning, first students must practice the new ideas in a practice form and then move to a more complex and fluid environment (Bransford et al., 1999). Several key methods for checking for comprehension for transfer of learning are informal checks, observations and dialogue, quizzes, tests, academic prompts, and performance tasks or projects.

Attaining effective transfer of skill applications represents one of the longest recognized, most complex problems in learning (Cornford, 2002). Several key issues are defined in a metastudy by Cornford regarding transfer that are similar to earlier findings (Bransford et al., 1997): a) conceptualizing transfer will only occur successfully after previous, in-depth learning (Mckeough, 1995); b) if transfer is desired then training needs to be geared towards effective transfer (Stokes & Baer, 1977); c) conscious awareness is

a prerequisite for transfer through initial problem recognition and definition (Perkinson and Saloman, 1989); d) distinguishing between types of transfer is important (Cos, 1997) (Detterman, 1993) (Singley & Anderson, 1989); and e) recognizing that strategies and principles involved with teaching get a particular transfer (Cornford). The success of transfer is dependent on a successful learning event. To achieve transfer, the basic knowledge, skills, and attitudes require comprehension (Cornford). The individual is responsible for applying skills supported by a scaffolding instructional approach (Cornford). This approach involves, "disembedding and embedding knowledge during the training process that supports transfer" (Cornford, p.100). Various forms of transfer influence how the learning affects skill application.

An effective strategy to establish this structural approach would be to apply an instructional model that focuses on transfer. The Transfer Design Model (Garavaglia, 1996), provides a strong emphasis on organizational follow-up and support to ensure transfer as seen in Figure 17.

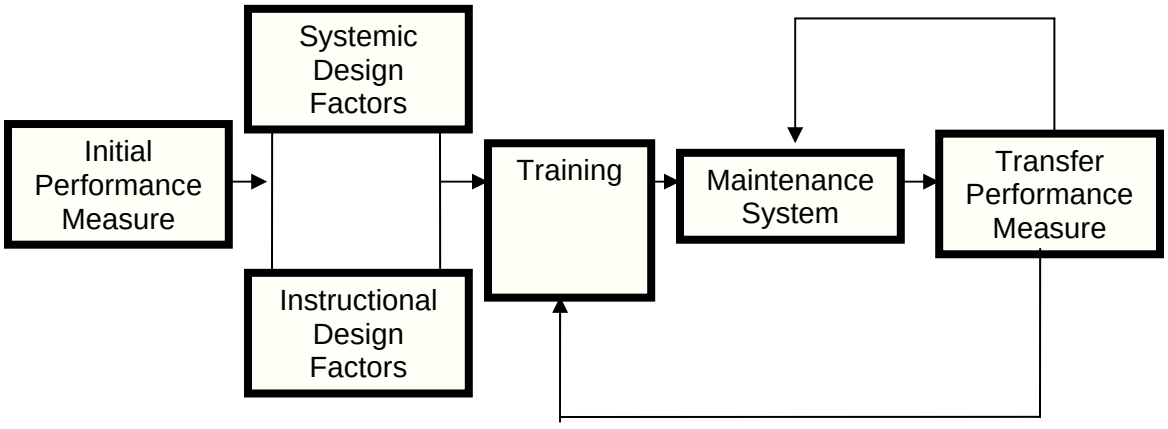

Figure 17. Garavagli's transfer design model (Garavaglia, 1996, p. 7).

The emphasis of taking a baseline measure (Initial Performance Measure) and providing the support (Maintenance System) and an outcome measure (Transfer Performance Measure) are significant for transfer. In a related study, the Nassau County Police Department, New York, evaluated supervisor's and line officer's completion of a Dale Carnegie course on interpersonal relations (McCarty, 2003). The evaluation of the training had three key objectives, to determine impact, application, and barriers for applying the skills. During this evaluation, the researcher(s) collected data following the training and sought to isolate the effects of training from their measurements (McCarty, 2003). The data converts to an equivalency of dollar value in time, efficiency, and service coverage. In this study, the researcher used action plans and questionnaires to determine the success of the course, the relevance of the material, and the degree of application. In their findings, a couple of key findings were noted that could have been prevented if an appropriate transfer model, like the Transfer Design Model (Garavaglia, 1996), had been applied. The goal to isolate the effects of training indicated that time makes this more difficult to accomplish and to measure. In addition, extraneous variables occurred during and following the training including a promotional exam for this target audience. The findings were that for acceptance, an overall 96 percent was received by participants but that the measure of ROI for the training (ROI=net benefit/costs) was less successful, with a 2.63 on a 5.0 Likert Scale (McCarty).

Although this evaluation was not highly scientific in design, it illustrates the challenge for organizations to follow up training with effective measures, support, and maintenance. Participants often leave a classroom very excited about the skills and find maintenance and generalization not available to support the use of the skills. Several key

concepts result from the Transfer Design Model (Garavaglia, 1996) is to isolate the skills, knowledge, and attitudes for measurement purposes and to conduct an initial performance measure. A significant maintenance system and transfer measure represents an equally important step in the process as the initial design. These measures should drive the training for future participants. A key finding from this study is that time transcends measurable elements into the full complexities of the job for recent trainees. As in the case of most any skill development, the evaluation of interpersonal skill development exists at all four of Kirkpatrick's (1979) levels of measurement. The impact of interpersonal skill development interventions is the primary focus of this research project but most interpersonal communication produces internal, not readily observable changes (Stevens & Hellweg, 1990). Measures of interpersonal skill development categorize as learning processes and learning outcomes (Holsbrink-Engels, 1997). As noted by Fleming and Levie (1978), "if the interface does not line up with a real task, the transferability of skills will be insignificant" (p. 15). Aldrich (2003) continues this thought on technological capabilities, "if the simulation does not provide a relevant, dynamic system that can be engaged from multiple angles, the learning will be trivial" (p. 14). Fleming and Levie (1978) reinforce this point by stating, "transfer is facilitated where the learning situation resembles the testing or application situation or where the learning is practiced in various realistic contexts" (p. 151). As in the case of the research study involving the *Jasper* video, "the vignettes provide contexts where learners interpret, reason , generate alternative approaches and test their ideas" (Hannafin, Hannafin, Land, & Oliver, 1997, p. 110).

Rehearsal.

One key pedagogical strategy is the use of rehearsal as a key attribute made available through simulations and online role-plays. Ericson (1993) denotes that deliberate practice is necessary; the coach cannot be there all the time so practice between lessons is critical. Erricson states "individuals are expected to perform in work so they revert back to more entrenched methods" (p.368). Although rehearsal only effectively sustains for limited amounts of time, it provides the opportunity to restructure knowledge and to tune skills. Fleming and Levie (1978) state, "transfer is facilitated where the learning situation resembles the testing or application situation or where the learning is practiced in various realistic contexts" (p. 151).

Summary on Impact of Learning

One key finding from various studies and authors is that transfer of learning and transfer of skills are dependent on the initial learning event. An additional finding is that the components for effective transfer embed into the instruction from start to finish as opposed to strictly a summative approach. As defined by Kirkpatrick (1979), four key levels of training evaluation range from acceptance, comprehension, application, and return on investment/impact of learning on job. A *Level 3* measure, or skill transfer, was the primary focus of this report. It is critical to understand that an important dimension of change occurs whether cognition is impacted or not, the affectual and emotional responses to the experience can affect results (Wolf, 1990). Wolf demonstrated this in a 1990 study with physicians in medical school taking an interpersonal communications course to assist with patient care and counseling. The results did not show any significance in cognition, but the impact on attitudes was significant. Wolf's findings

began with the use of interpersonal skills instructed by video for evaluation purposes but they became very instructional for the learners.

Garavaglia (1996) denotes the Transfer Design Model (Garavaglia) promotes isolating the skills, knowledge, and attitudes for measurement purposes and conducting an initial performance measure. An additional emphasis should be placed on aligning the design factors with both the systemic environment and instructional need. Three top enablers for transfer of learning were defined as an opportunity to use the knowledge or skills, maintenance for applying the knowledge or skills through coaching or feedback, and content that reflects what actually happens on the job.

Summary of Literature Review

This literature review evaluates the capabilities to sustain learner knowledge and to enhance skill transfer through asynchronous technologies. The specific course objectives focus on programming for interpersonal skill development for adult professionals. This review addresses the elements of interpersonal communication skill development impacting leadership development, social modeling for learning disabilities, and counseling instruction. The process of learning interpersonal skills encounters changes in pedagogical practices based on evolving technology. Using online technologies as an instructional strategy for interpersonal skill development offers specific advantages such as reduction of learning time, reduction of expenses, consistency of message, and the ability to replicate realistic and safe practice experiences (Bainbridge, 1995). In a 1997 study, G. Holsbrink-Engels determined "computer-based role playing enhances the learning of interpersonal skills" (1997). She uncovered significant differences in performance, classification, and application of interpersonal

skills. This study indicated the use of simulated role-plays, conversational models, and reflective feedback support asynchronous learning environments. Defining effective strategies and media to enhance long-term knowledge and the skill transfer of these skills is the thread of this research with hopes of generalizing these findings back to varied disciplines.

In teaching interpersonal skills through any specified methodology or technology, the designer must consider first the required skills, how they are best applied, how they are best learned, and how they are best evaluated. The definition of interpersonal skill development considers the perspectives of researchers in communication science, leadership development, educational, and professional counseling. Interpersonal skills represent three broad categories: developmental, remedial, and specialized (Holsbrink-Engels, 1998). The research focus of this literature review has been on the specialized category of skills. The specialized skill category is organized by Holsbrink-Engels (1997) into three levels for professional development: super ordinate, basic, and subordinate. The application of social communicative problem solving reflects the goals of most interpersonal skill development initiatives. The provision of expert level skill in knowing when, how, and what to communicate is the goal of interpersonal skill development. As one researcher defined it, the use of *nexting*, or the ability to keep the flow of communications moving within a positive environmental climate, is the key to expertise in interpersonal skills. One key skill set that supports the ability to perform "nexting" is that of listening. Bainbridge (1995) defined listening as the ability to hear, interpret, evaluate, and respond in an effective manner.

The learning of interpersonal skills involves the synchronization of both social and cognitive skills where timing is critical. As defined by Mager's (1992) six rules on

the transfer of knowledge, interpersonal skills rely on supportive initiatives beyond the content of a class and achievement on a test. The support and reinforcement following the training are critical for successful application. As described by Buber (1970), interpersonal skill development involves moving from an "I-It" to an "I-Thou" approach. Vanlehn (1989) defines specific reasons for the high cognitive load in social communications in that problems are not well defined, execution of steps occurs simultaneously, problems can change, feedback is limited, and most social communicative problems have an ill-defined goal state. In addition, Holsbrink-Engels (1997) supports the need for the learner to reflect on the experience in computer-based learning. Yates (1978) mentions that involvement in actual social situations is the most effective manner to learn interpersonal skills, with role-plays as the second best method.

An effective strategy for designing and implementing role-plays enhances the opportunity to reduce cognitive overload and to ensure sound pedagogical practices. The application of role-play for learning interpersonal skills will be the key instructional strategy employed in this research. Ensuring that learners have adequate time to reflect on their behaviors and their approach is critical for the design of interpersonal skill development. The ability to develop schemata acquisition that allows for effective interaction and problem solving in a manner that achieves goals, offers solutions, and enhances the relationship with persons in most any environment. This strategy raises significant opportunities for design approaches with the implementation of computer-based methods and technologies.

The overall factors guiding computer-based and online learning initiatives are instructional methods, instructional media, and media. Elearning offers a broad combination of processes, content, and infrastructure that uses computers and networks to

improve learning including management and delivery (Clark, 1999). The instruction, within an asynchronous module, should follow three critical paths to achieve post-instructional reinforcement and evaluation goals. These paths consist of pedagogical, technological, and environmental for an effective instructional process. The pedagogical approach applies the use of effective design, development, and delivery strategies and tools to support the learner and learning. The technological applies the asynchronous tools and multimedia interface design principles necessary to significantly impact learning in interpersonal communications. Some of the elements that affect this form of learning are computer-mediated communication tools and the development of virtual communities for learning. These social communities are deeply ingrained conventions of social interaction that tend to exert themselves unconsciously in human-computer interactions (Clark, 1999). The learning environment as well as the cultural acceptance of these skills must coincide.

The instructional approach for teaching interpersonal skills parallels conventional methods with scenario-based learning or role-play strategies. The use of asynchronous technology to support this learning approach develops from the findings of Weller and Blaiwes' (1977) use of computer-assisted judging and feedback, Schroeder's (1986) use of videodisc technology to effectively teach interpersonal skills, and Holsbrink-Engel's (1997) use of conversational models and opportunities for reflection. These components synthesize with the findings on multimedia interface design by Mayer and Moreno (2002), Clark and Lyons (1999), and Mayer and Clark (2003) to support the design of an asynchronous model for interpersonal communication development. Four key design guidelines are necessary to ensure effective learning strategies and focused learners according to Mayer and Clark (2003): a) Interactions should mirror the thinking

processes and job environment; b) Better learning results from more practice interspersed throughout the learning; c) Practice questions should be consistent with the *Media Elements Principles;* and *d)* Learners should be trained to provide their own questions for self-regulation (p. 152). The development of learning through motivation and self-regulation is paramount in ensuring the success of offering interpersonal development learning through computer-based or elearning opportunities. In 1990, Johnson and Johnson reported this thought on online learning, "Simply placing students in groups and telling them to work together does not in itself promote higher achievement" (p. 34). The characteristics of the learner include their previous knowledge, contextual application, motivation, and attitudes. How the learning occurs is critical to its success, such as how the learning provides chances to build on itself incrementally. The designer or instructor can impact learning with consideration of how learners process, organize, and retrieve units of information and memory. There are supporting templates for these elements, such as Gagne's Nine Events of Instruction (1978) supporting issues of scaffolding, fading, and anchored instruction. In our example, learning interpersonal skills requires a high-road transfer of cognitive skills. One model that clearly defines this stage would be the cognitivist's perspective of Atkinson and Shriffen's (1968) dual processing model of sensory register, short-term memory (STM), and long-term memory (LTM). The cognitive capabilities exist that allow for "*expert performance*" with the development of mental models and effective conceptual bridging. Applying communication skills also relates to the studies of complex problem solving.

The problem-solving process for ill-structured problems requires specific learner instructional strategies to achieve mastery and develop mental models. The context of the problem and its' constraints can provide an effective scenario to practice and solve. It

is these learning philosophies that support the development of a learning module that provides accretion, assimilation, or tuning (Norman, 1978) of knowledge. Mental models are realmed in behaviorist and constructivist influences, although predominantly a cognitive discourse. As this review begins a look at transfer of skills and impact of learning, the efficiency of mental model development will play a key role in developing interpersonal communications.

One key finding from these studies is that transfer of learning and transfer of skills are dependent on the initial learning event. An additional finding is that the components for effective transfer occur from start to finish in instruction as opposed to strictly a summative approach. The evaluation of interpersonal skill development exists at four levels of measurement: satisfaction, comprehension, application, and impact (Kirkpatrick, 1979). It is critical to understand that an important dimension of change occurs whether cognition is impacted or not, the affectual and emotional responses to the experience can impact results (Wolf, 1990). This finding supports earlier findings by Sir E. Bartlett (1932) in his determination of the learner's use of "*sympathetic weather*" or individual bias, attitudes, and influences.

Four key elements were found to support transfer by Bransford (1999): a) Initial learning is necessary for transfer; b) Knowledge that is overly contextualized can reduce transfer, abstract representations promote transfer; c)Transfer is best viewed as an active dynamic process versus passive end-product of a set of experiences; and d) All new learning involves transfer based on previous learning. A number of critical variables impact transfer of learning and skill transfer. Garavaglia (1996) synthesizes the key elements from four models to define his Transfer Design Model. Several key concepts result from the Transfer Design Model (Garavaglia) that promote isolating the skills,

knowledge, and attitudes for measurement purposes and conducting an initial performance measure. The design factors should represent both the systemic environment and instructional need. The measurement and enhancement of skill transfer requires a structured and systemic approach in design and instructional strategies.

The use of computer-based simulations to enhance learning and skill transfer relates directly to the ability to provide the learner repetitive presentations (Walberg, 1988); elaboration and opportunities for reflection (Holsbrink-Engels, 1987); (Rieber & Tzeng, 1993); and rehearsal (Walberg, 1988); (Ericcson, 1993). Ensuring that learners have adequate time to reflect and elaborate on their approach is critical for the design of interpersonal skill development. As articulated by B. F. Skinner (1968) "we learn by doing, we learn from experience, and we learn by trial and error" (p. 8). It is through simulated rehearsal that enhanced transfer for participants in the LET online learning modules occurs.

CHAPTER 3: METHODOLOGY

Need for Study

Interpersonal communications encompasses a number of skills relative to personal, academic, and professional success in today's world. One premise is that interpersonal skills are composed of higher order knowledge used daily (Gagne, 1988). The need to develop social skills through explicit training reaches beyond just leadership development, embracing counseling, education, and many other fields of study. Despite this need, interpersonal communications remains a skill set that lacks in discourse due to the lack of substantial research, instructional measurement, and defined methodologies (Hallahan, 2002, p. 258).

The learning of interpersonal skills involves a complex learning environment. As stated by Holsbrink-Engels (1997), "cognitive load is high during social-communicative problem solving because the execution of all steps has to be taken immediately in a goal-directed dialogue" (p.53). Teaching social skills involves two major difficulties; one is the infinite number of social situations requiring goal-based interactions (Yates, 1978). The second difficulty is that social skills cannot be taught in packages, the learning requires smaller units such as listening, being polite, being cooperative (Yates). Interpersonal skill development requires applying human interactive elements with consideration of the frailty of professional and personal relationships. In other words, the cost of mistakes can be high and replication of real life becomes more complex and difficult to accomplish within a certain sequence of behaviors. This instruction, within an asynchronous module, parallels conventional methods with scenario-based learning or role-plays. The use of asynchronous technology to support this learning approach will

build from the findings of Weller and Blaiwe's (1977) use of computer-assisted judging and feedback; Schroeder's (1986) use of videodisc technology to effectively teach interpersonal skills; Kass, Burke, Blevis, & E. Williamson's (1993) interface for reflection and elaboration, and Holsbrink-Engel's (1997) use of conversational models and opportunities for reflection. The teaching of interpersonal communications in a computer-based, individualized method could offset some of the risks and anxieties associated with leadership program role-plays in face-to-face environments.

The need to define best practices in learning outcomes also remains a significant challenge. The evaluation of skill application and transfer (Level 3) was reported at 21% in 2003 (Sugrue, 2003) and indications of industry-wide reduction in Level-3 measures in 2004 at 14% (Sugrue & Kim, 2004). The availability of more effective instructional strategies to learn and measure interpersonal communication skills, could support the measurement of skill applications. It is also the goal of this developmental study to move towards future research on how post-learning events can enhance comprehension, recall, and application of interpersonal skills following an initial learning experience. The availability of more effective strategies and methodologies for tuning interpersonal skills could greatly support investments in interpersonal communication development. In order to move closer to some of these goals, a Type One developmental research is applied toward the development of a post-module instructional module on interpersonal communications for a commercial leadership development program.

Research Question

This study applies a Type One developmental research approach which implies gradual growth, evaluation, and revision. The research question for this developmental research states:

> What are the theoretical and practical considerations for effective design, development, and evaluation of an asynchronous post-instructional learning review module for interpersonal skills?

The findings from the actual design and development of this computer-based strategy were analyzed to justify program interface and operability. The methodologies and instruments defined in this chapter investigate this question through effective data collection, analysis, and formative development of a computer-based learning module.

Methodology

The study approaches the development of this asynchronous module in three phases. In Phase 1: *Assessment,* the design effort was based on program content previously developed by Gordon Training International, Inc. (Gordon Training International [GTI], 1977). A set of key learning objectives for the review module derive from current key learning objectives implemented by the class-based Leader Effectiveness Training (LET) program (See Appendix A). The collection of design data began in Phase 2: *Design* with reviews by an expert panel of LET facilitators on the module performance objectives, storyboards, and simulation solution feedback. The transition from Phase 2: *Design* to Phase 3: *Development* occurred during the pilot test conducted with one-on-one reviews supported by observations and interviews. The

formative data for Phase 3: *Development* was collected in two field trials of the module with one target group.

The comprehensive process of instructional development follows five major activities: (1) assessing the learner needs, (2) designing a set of specifications that seek predictable learning outcomes, (3) development of the learner materials, (4) implementation of the instruction, and (5) formative and summative evaluations (Gustafson & Branch, 2002). Comparisons are drawn between the elements of mastery learning and instructional development (Gagne, 1988). The instructional development process for this research is shown in Figure 18.

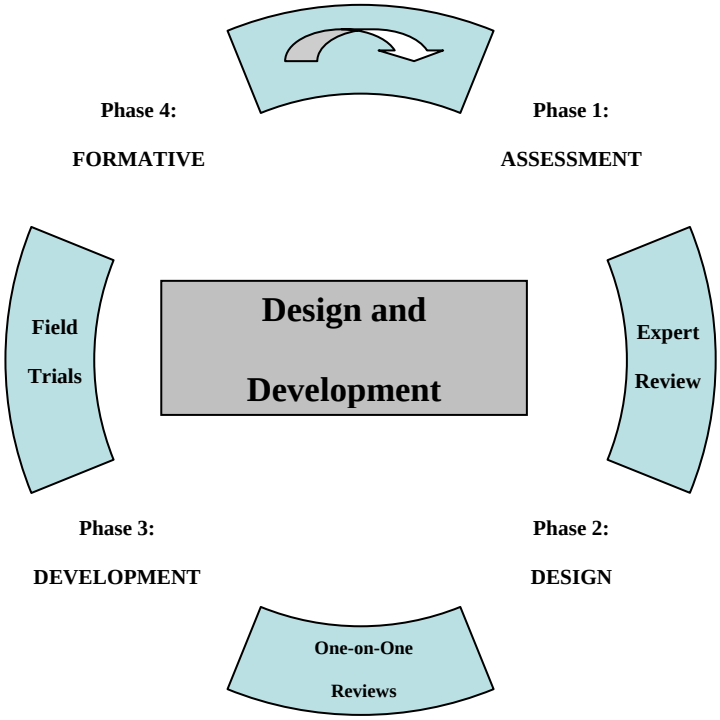

Figure 18. Design stages with tools and instruments.

In this developmental research, a modified ADDIE model supported a structured path for learning and conceptual reinforcement. The use of ADDIE offered to inform readiness for the next step and to ensure continuous revision (Gustafson & Branch).

Participants

The target audience consisted of adult participants from professional settings that completed the three-day, class-based LET workshop. Attendees of this leadership program work at various levels of management and professional levels within organizations of corporate, government, education, and nonprofit sectors. The participants completed the LET class-based program, within a time period of no less than 30 days nor more than 90 days. An expert review panel was selected on a volunteer basis from the GTI certified facilitators with the communication assistance of Gordon Training International's Director of Client Relations. The evaluation sessions were defined as: (1) one-on-one reviews session ($n \approx 6$) and two (2) field trial evaluations ($n \approx 12$ for each session).

The one-on-one review sessions consisted of recent managerial LET attendees selected from the New River Volvo Truck Plant, a local manufacturing organization . The field trial sample participant groups consisted of a convenience sampling of participants selected from a team of managers with the Saint Joseph Hospital System, London, Ontario, Canada. The criterion for participant selection consisted of (1) LET class completion within the specified time periods noted above and (2) volunteer participation denoted by the completion of the IRB Informed Consent Online Waiver. One-on-One Review participants completed hard copies of the IRB Informed Consent Online form and hard copies of the evaluation instruments. Field trial participants received CDROMS via the contact facilitator for Saint Joseph's Hospital with an internet link to the IRB Informed Consent form managed online by a survey tool, WebSurveyor. This research was approved through the Virginia Tech Institutional Review Board as an IRB Expedited Approval by a letter dated December 15, 2004 and found in Appendix F.

The feedback from these participants provided the formative data necessary for a useable module that reinforces intellectual, psychomotor, and affective domains.

Developmental Product

The developmental product consisted of an asynchronous, interactive, computer-based learning module. The module provided learners access to three review modules on key learning concepts of the LET program as defined in the section on content. The module also provided a set of three simulated role-plays for knowledge restructuring and tuning, which are referenced as sim-modules throughout this report. The development of the LET computer-based review modules and sim-modules applied a formative feedback approach with the use of expert review panels, one-on-one reviews, and field trials. The instructional design of the modules followed a modified ADDIE model, with an emphasis on the elements of the design model developed by Garavaglia (1996). The Garavaglia Model focuses on learning maintenance factors leading to the transfer of skills and knowledge as shown in Figure 19.

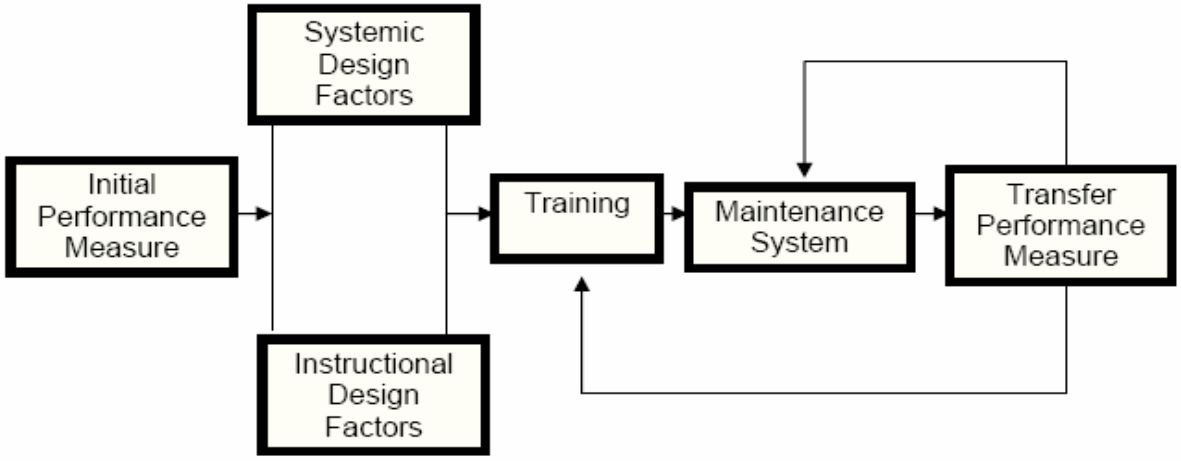

Figure 19. Garavagli's transfer design model (Garavaglia, p. 7).

Developmental Standards

The development of this product for interpersonal skill development applied the standards from the American Society for Training and Development e-Learning Courseware Certification (ASTD, 2002). The four categories of standards for the ASTD e-Learning Courseware process are interface, compatibility, production quality, and instructional design (p. 3). The ASTD courseware certification process applies a courseware self-assessment checklist provided online by ASTD (See Appendix C). A developmental model checklist (See Appendix C) referenced the standards defined by ASTD and supported the monitoring of levels of standards achievement during development.

Development Plan

The development of an asynchronous computer-based module required effective project management, planning, and communications. Successful development also depended on the use of the appropriate software and delivery platforms. The LET review modules and sim-modules required an assortment of tools for the total project. The evaluative tools applied web-based survey instruments for efficiency and just-in-time responses to program evaluations and feedback. In the following sections, the technical requirements and specifications are highlighted for program functionality and support. Finally, the program offered maintenance and support to both one-on-one review and field trial participants while engaging in the programs.

Development Tools

The learning modules were built from Toolbook II Instructor (Click2Learn) as the primary course development software. Toolbook II is a courseware authoring system that

creates and distributes online learning applications (Toolbook Development Team, 2000). Students can access programs developed in Toolbook II in web browsers as Hypertext Markup Language (HTML) or use the Toolbook II Neuron browser plug-in to view the program as a native Toolbook II program (.TBK) in a Web browser. The participants required the following technical items to operate the modules on their computers as shown in Table 3.

Table 3

Participant technical requirements for playing Toolbook II modules.

	AUDIO	**VIDEO**	**DELIVERY**	**PLUG-INS**
Toolbook II Instructor	Sound card to play digital audio files. Speakers or headphones to play audio	Video playback drivers and video codecs to play digital video	CD-ROM	Windows Media Format Or Real Media

The delivery plan involved placing all media files on a CD-ROM for delivery to participants as a hybrid developmental approach. The computer-based Toolbook II Instructor modules included graphics, audio capabilities, video player capabilities, online interactions, self-test questions with feedback, and hypertext-based navigation and information accessibility. Audio (MP3 files) development and video file shooting, editing, and digitizing allowed the media to be used within the Toolbook II Instructor modules and the sim-modules. All media files were packaged within a resource folder for both the HTML versions of Toolbook II and the sim-modules and accompanied these executable files for effective delivery.

The sim-modules comprised the primary learning rehearsal for the asynchronous program through interactive branching-based events. The developmental program for the sim-modules used Intermezzon Designer II (Intermezzon, 2004). The Intermezzon

Designer II tool applies Flash files with the use of a simulation engine providing branched decision-making by the participant. The development of Intermezzon programs offered an HTML-based format for web delivery with the application of two plug-ins and the standard audio technical requirements as shown in Table 4.

Table 4

Participant technical requirements for playing Intermezzon Designer II simulations.

	AUDIO	**VIDEO**	**WEB**	**PLUG-INS**
Intermezzon DesignerII	Sound card to play MP3 digital audio files. Speakers or headphones to play audio	No Video Requirements	Internet Explorer or Netscape Navigator browsers	Flash Player Intermezzon Player

Programs developed in Intermezzon Designer II are animated simulations that synchronize Flash-based animated characters with MP3 audio files. This development tool offered high flexibility and revision capabilities when compared to video clips. This approach offered a more cost effective approach to simulation development with many of the advantages of human-computer interface. The use of animated simulation characters provided learners the opportunity for a computer-based social presence as seen in Figure 20.

Figure 20. Sample of sim-module simulation screen.

Module Interface.

The initial instructional strategies should encompass a display of mastery performance and first-person video narratives of experienced practitioners of the skills (Kass, Burke, Blevis, & Williamson, 1993). The learning strategy should entail scaffolded learning elements such as opportunities for reflection and a conversational model (Holsbrink-Engels, 1988). The use of reflection and elaboration offers the learner deeper learning through knowledge structuring (Rieber & Tzeng, 1996); (Holsbrink-Engels, 1988). The use of direct feedback and online coaching for the role-play performance supports meta-cognitive skills and learning motivation (Ericcson, 1993; Rieber, 1990; Hannafin & Rieber, 1989; Kass, Burke, Blevis, & Williamson, 1993). These module interface attributes are highlighted in Figure 21.

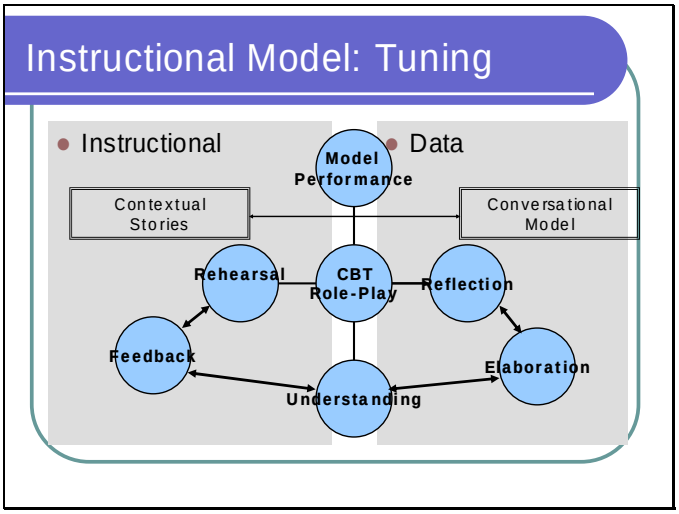

Figure 21. Interface design template for instructional modules.

Evaluation Instruments

All data collection instruments were developed in an online survey development tool called WebSurveyor. The online surveys and evaluations were published to an HTML format and links were housed on the evaluation website. Results were collected

online via the local host personal computer bearing the WebSurveyor license and program. The requirements for WebSurvyor online instruments are shown in Table 5.

Table 5

Participant technical requirements for evaluative and implied consent instruments.

	SURVEY FORMAT	**WEB**	**PLUG-INS**
Websurveyor	Surveys developed in HTML formats, accessible on Windows browsers	Internet Explorer or Netscape Navigator browsers	None Required

The instruments, *Participant Barriers to Elearning Scale* (Berge & Muilenburg, 2003) and the *User Interface Rating Form* (Reeves & Harmon, 2003), involve both pre- and post-test data collection from participants and were administered via Websurveyor.

Pre-Instructional: Participant Barriers to Elearning Scale

The pre-instructional instrument, *Participant Barriers to Elearning Scale*, adapted from Berge & Muilenburg's Student Obstacles to Online Learning Scale (2003), offered the opportunity to categorize formative feedback by participant self-perceptions on barriers to elearning. Contact with Berge and Muilenburg resulted in written permission to use and adapt their scale to this research. The Berge-Muilenburg instrument was reported to have no findings on validity and significant reliability findings, which will be reported in the instrument reliability section for both one-on-one reviews and field trials. The expert review panel received a copy of the survey via WebSurveyor with the goal to strike items in the instrument that do not apply to this formative module evaluation. The Websurveyor instrument allowed for open-ended comments on items which may affect their acceptance or rejection as instrument items. The final version of the *Participants Barriers to Elearning Scale* measured participant self-perceptions on elearning as a pre-

evaluative measure. These results were compared to the post-measurements taken for a bivariate correlational analysis of how barriers impact usability. This analysis will offer indications of association but are not statistically significant due to small sample sizes.

Post-Instructional: User Interface Rating Form

The post-instructional instrument, *User Interface Rating Form* (Reeves & Harmon, 2003), is available to the eLearning Guild community as a community resource tool. No validity or reliability analysis data is available on this instrument. The purpose of the *User Interface Rating Form* is to obtain formative data from participants that have completed the asynchronous review modules and sim-modules.

Descriptive statistics are applied to the formative developmental process based on the ten specific user interface categories in the instrument (See Appendix G). Again, the expert review panel received a copy of the survey via WebSurveyor with the chance to strike items in the instrument that do not apply to this module evaluation. Formative data collected via the instruments was documented in the Evaluation Matrix (Appendix E).

Analysis of Both Instrument Data Sets

The data collected in the pre-module survey (Participant's Barriers to Elearning) and the post-module survey (User Interface Rating Form) was applied toward formative development and program goals. The evaluation of how a respondent sees interface, navigation, content knowledge, quality, and aesthetics was defined by descriptive statistics covering the interface categorical areas. A participant's view and ratings of the values of a module could be influenced by their perceptions of elearning in general.

Development Administrative Tools

The application of all of these media, computer-based, and online courseware tools required effective project management procedures and plans. The formative and developmental tracking data was managed via the following tools (Appendix C and D) and shown in Figure 22.

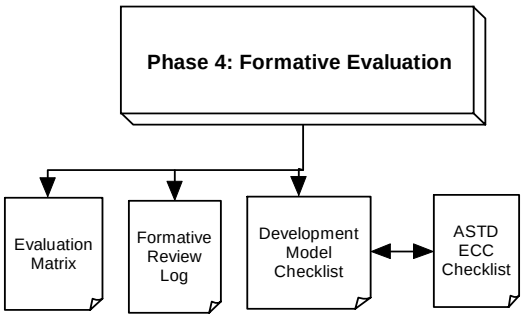

Figure 22. Administrative tools for monitoring development and formative feedback.

Content

Phase 1: Assessment

The content was based on an instructor-led training program for managers and professionals entitled Leader Effectiveness Training (LET). The LET program is the licensed product of Gordon Training International (GTI). Gordon Training International provides training through LET certified trainers throughout the world. The program serves 164 companies and organizations throughout the United States and is facilitated in 19 international countries (Adams, 2004). The founder of LET, the late Thomas Gordon, worked as a student of Carl Rogers, the noted researcher and author in communications (Adams). Gordon developed his model, *The Behavior Window*, followed by his 1962 book, Parenting Effectiveness Training (Gordon). This work led to the development of Teacher Effectiveness Training and Leader Effectiveness Training in the 1970's

(Gordon). The instructor-led LET program is three-days in length and focuses on 24 key competencies and performance objectives (See Appendix A).

This developmental research specifically focused on the development of four review sub-modules from the workshop, supported by simulations synthesizing the content from all four sub-modules. The program covered ten of the twenty-four key learning competencies. These competencies covered the use of the Behavior Window Model, the definition of problem ownership, active listening, effective confrontations, and a skill entitled shifting gears which incorporates the Behavior Window, active listening, and effective confrontations (Gordon, 1977). The competency skills in Table 6 have been shared with a large number of managers and professionals in the workplace with the purpose of enhancing their interpersonal skills.

Table 6

Leader Effectiveness Training key learning competencies (Gordon, 2004).

Review Modules	**Competency**	**Competency Description**
Behavior Window	1	Determine who "owns the problem" in a given situation.
"	9	Distinguish between Acceptable and Unacceptable Behavior.
Active Listening	3	Distinguish between Roadblocks and Active Listening.
"	4	Avoid the Roadblocks that cause most helping attempts to fail.
"	5	Recognize when team members need your help as a skilled listener.
"	7	Active Listen to hear another's feelings.
"	8	Active Listen to clarify information.
Confrontive I Message	11	Develop a three-part Confrontive I-Message.
"	12	Confront another's unacceptable behavior with an I-Message.
Shifting Gears	13	Shift gears between I-Messages and Active Listening when appropriate.
Sim-Modules	**Competency**	**Competency Description**
Shifting Gears	Synthesis of all competencies	Shift gears between I-Messages and Active Listening when appropriate.

The asynchronous review modules (Behavior Window, Active Listening, Confrontive I-Messages, and Shifting Gears) are represented in Figure 23 indicating the computer-based module interface developed in Toolbook II.

Figure 23. Review modules and program interface in version one.

As can be seen in the interface for the review module above, the module provided navigational buttons for the review modules and the simulations. The navigation allowed for an opportunity to reflect on learnings through journaling and video-based stories [REFLECTION]. The program also offered navigational capabilities throughout the program establishing a constructivist design approach where the participants can flow to any module at any time for review.

The learning goal worksheets for these concepts defined the performance, conditions for learning, learning outcomes, and criterion for learning (See Appendix B). The computer-based modules in this research focused on the review of skills and terminology previously learned in the three-day Leader Effectiveness Workshop. Participants have the ability to access online skill coaching that is tied directly to the module they are completing. The content applied both audio narration and video representations of LET content as shown for the Behavior Window in Figure 24.

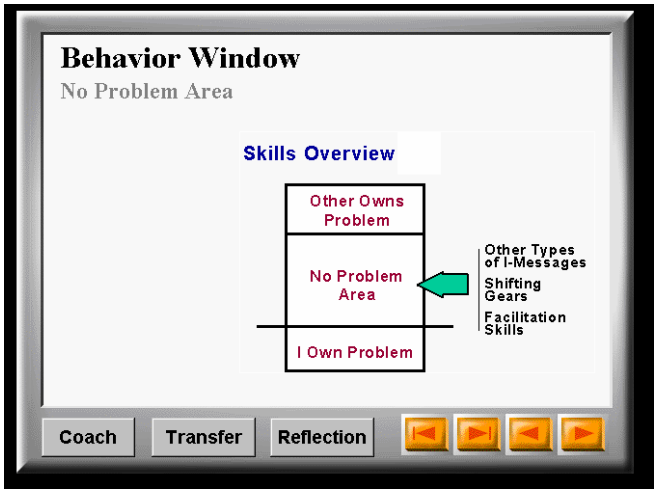

Figure 24. Content screen for review modules.

During both the review modules and the sim-modules, participants had access to a library of videotaped case histories and credibility statements by previous graduates of LET programs by clicking the TRANSFER button. The media clips provided credibility and application-based tips to support transfer for participants as demonstrated in the Guided Social Simulation modules by Kass et al. (1993). In addition to the media clips, the Reflection button provided a computer screen journal, which can be saved as a text-file or printed at the end of the program. This opportunity provided the participant the opportunity for reflection and elaboration (Holsbrink-Engels, 1997).

The simulated role-plays in the sim-modules constituted a higher level of intellectual skills and problem solving through the application of concepts and techniques covered in the review modules. In Figure 25, the simulation module provided an avatar-like interface in which the participant viewed the other person and heard their audio responses for simulated LET practice situations.

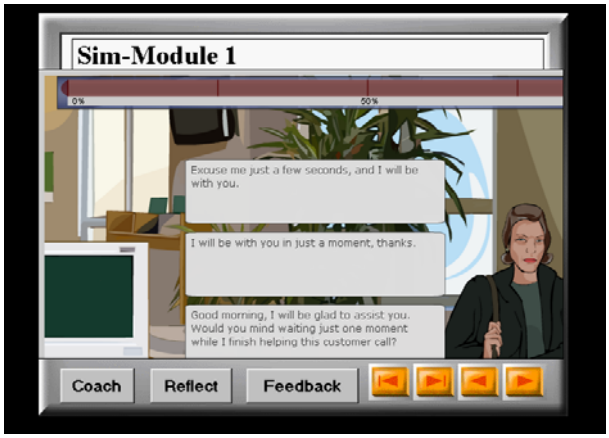

Figure 25. Sim-module human-computer interface.

During the sim-module, the participant selected the verbal responses most appropriate for the situation from text-based selections presented on-screen in text-bubbles. The selection of choices was tracked and determined the influence of how the other person responds, the feedback available to the participant, and the coaching dialogues presented. The purpose of the computer-based modules were to support the retention and transfer of interpersonal skills provided in the LET program for participants. To prepare this content required a structured design approach.

Phase 2: Design

Review Module Design

The design of the module applied an ADDIE approach with a strong focus on formative evaluation during implementation. The ADDIE model focused on: Assessment; Design; Development; Formative Evaluation (Implementation); and Summative Evaluation (Gustafson & Branch, 2002). Because the Leader Effectiveness Training was pre-designed, the literature review of this research served as the Phase 1: *Assessment* of this project. This project began with Phase 2: *Design* in which the

performance objectives, module storyboards, and paper-based simulation solutions feedback underwent evaluation and review by an expert review panel as shown in Figure 26.

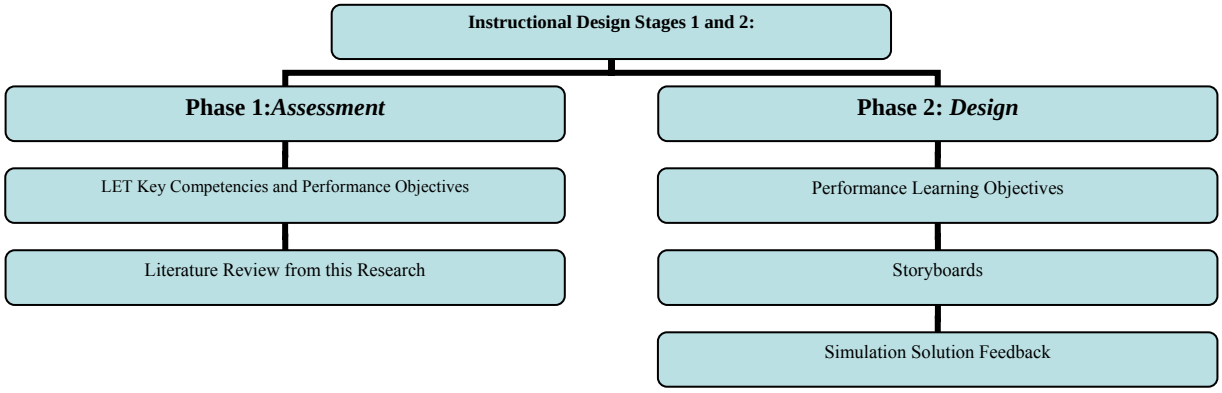

Figure 26. Instructional assessment and design stages and tools.

Expert Review Panel

The expert review panel represented five GTI Leader Effectiveness Training facilitators selected from volunteer responses to an email requesting volunteers. The expert review panel offers support for content feedback and it provides an element of efficiency to the process (Walber, 1988). The use of an expert review panel offered insight into the program's design that are not easily determined from a designer's perspective.

The Phase 2: *Design* process began with an email contact from the researcher with expert review panel volunteers (LET facilitators) nationwide. The GTI Director of Client Relations initialized this process as shown in Figure 27 with an introductory email constructed by the researcher for the Expert Review Panel.

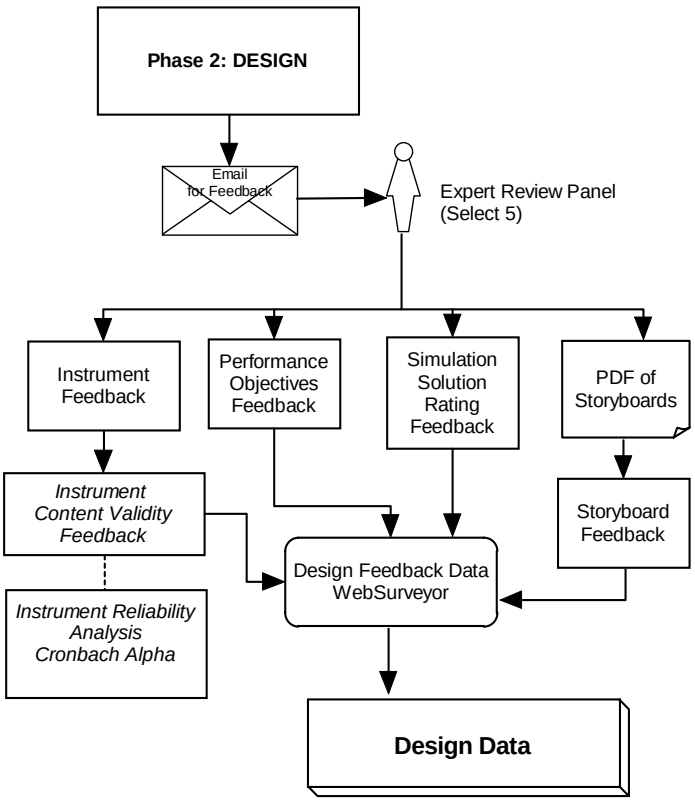

Figure 27. Phase 2: Design process.

The facilitators selected for the expert review panel offered a minimum of three years facilitation experience, professional training backgrounds, and an expressed motivation to transcend the Leader Effectiveness Training program to the next level of learning. Communications with the facilitators relied on the use of an internet site, the Developer's Resource Website, at http://filebox.vt.edu/users/rholland/DRW.htm. The expert review panel feedback responses were delivered via an online survey tool, WebSurveyor. This approach allowed for efficient and accurate data collection from the field with opportunities to support closed- and open-ended questions. The design data collected from the expert review panel supported the definition of performance learning objectives, student acceptance of the program interface and flow, and support in instrument content validation.

Instrument validation and consistency.

The question of content validity for the use of the two evaluation instruments comprised an important element for this research. In order to establish content validity on both instruments, feedback from the expert review panel was used. The intent to measure what is actually being measured is achieved through several elements: asking if the research findings match reality; taking data back to the participants to determine plausibility; using multiple resources for data; observing over extended periods; involving participants in the research; and recognizing and addressing researcher bias (Merriam, 1998). To ensure that the indicators are homogenous within these instruments, the answers to three questions were sought: *Does the instrument define the characteristic the same way that I, or others, define it?*; *Does the instrument really measure the intended characteristic?*; and *Does the instrument measure some other characteristics that it is not intended to measure?* (Aylesworth, 2002).

Expert Review Panel Summary

In Phase 2: Design, an expert review panel was selected and information collected on both design methodologies, instructional strategies, and validation of program content. The design of the module relied on feedback from the Expert Review Panel on performance learning objectives, storyboards, and the simulation flow feedback. The feedback provided by the Panel supports the transition between Phase 2: *Design* to Phase 3: *Development*. In the next section, the processes for data collection, course evaluation, and formative revision are defined.

Phase 3: Development

Review Module & Sim-Module Development

The use of evaluation and data collection methodologies occurred in both Phase 2: *Design* and Phase 3: *Development.* In this section, a description of key data collection strategies were applied including a one-on-one review and field trials of the module. The transition from Phase 2:*Design* to Phase 3:*Development* was supported by the use of the One-on-One Review observations and interviews.

One-on-One Reviews

The One-on-One Review pilot test allowed for testing of technical, interface, aesthetic, and navigational capabilities of the module. The session was held independently of a class-based LET program with a sample of six participants that had completed the LET class 30 days prior to the pilot test. The participants completed an IRB Informed Consent form prior to volunteer participation. After completing the IRB online form, the *Participant Barriers to Elearning Scale* instrument was administered online. Upon completing this survey, participants accessed the modules at independent computers within a learning PC lab setting. The participants were allowed one hour to complete the modules. During the one-hour session, the developer conducted observations of the class. The observations focused primarily on navigation, orientation, completion times, and general reactions by the participants. The collection of data applied to the formative development and instrument reliability measures as shown in Figure 28.

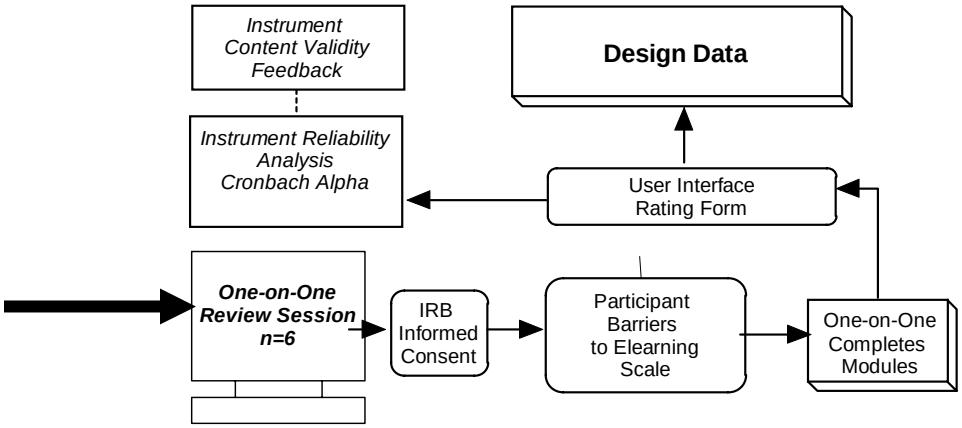

Figure 28. One-on-One Reviews pilot test process.

The participants were prompted at the end of the computer-based program to complete the online *User Interface Rating Form*. Informal one-on-one interviews were conducted following the program completion by the researcher/developer. A standard interview protocol was adhered to during the interview sessions with the group (See Appendix E).

One-on-one review observations.

The process of collecting data through observations can be broken into three stages "entry, data collection, and exit" (Merriam, 1998, p. 98). The environmental factors engaged in a learning environment must be considered to ensure consistent and relevant observational data. The use of observation serves as a research tool when serving a research purpose (Merriam, 1998). In the use of observations for this one-on-one review pilot test, it was critical to denote variables within the learning environment as well as participant activities. The application of the computer-based learning modules focused on the participant completion times, engagement, navigational ease, and ability to map their orientation throughout the program.

One-on-one review interviews.

The interview process for the One-on-one Review participants followed these steps: (a)organize the group; (b) generate the questions;.(c) determine the development goals; (d) construct a interview agenda, (e) administer the interviews using the Interview Protocol questions; (f) analyze the data; and (h) use the results for developmental purposes. The questions followed the ASTD elearning certification course (ASTD, 2002) categories to ensure the data is relevant for module development.

One-on-One Review Summary

The use of the One-on-One Review pilot test involved the selection of the participants from recent LET graduates at a regional manufacturing plant. The purpose of the One-on-One Review was for compilation of observational, compilation of interview data, and application of the feedback toward formative development. The transition from Phase 2: *Design* to Phase 3: *Development* was strongly supported by the design data received from both the Expert Review Panel and the One-on-One Reviews.

Field Trials

In Phase 3: *Development,* the participants participated by taking a fully developed version of the module in order to provide quantitative feedback via the pre- and post-instruments. The previous design data contributed to this level of module development. The Field Ttrials allowed for testing of technical, interface, aesthetic, and navigational capabilities of the module. The session was held independently of a class-based LET program with participants that had completed LET 30 days prior to the pilot. First, the participants completed an IRB Informed Consent form prior to volunteer participation.

The form requests contact information from the participants to allow mailing of a CD-ROM either to their LET facilitator or directly to themselves as shown in Figure 29.

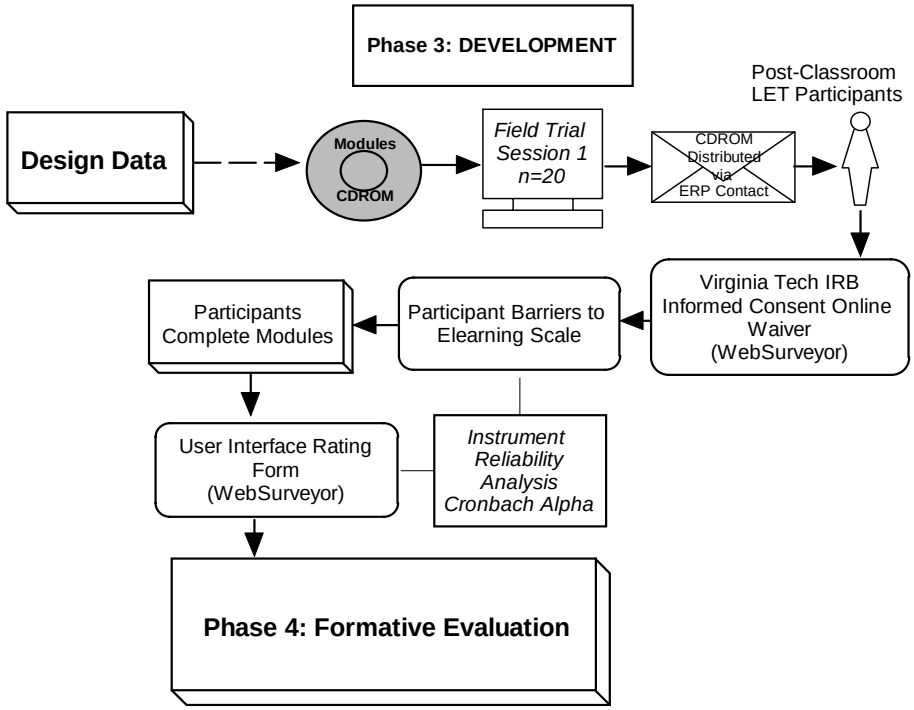

Figure 29. Phase 3: Development process model.

After completing the IRB online form, the *Participant Barriers to Elearning Scale* instrument was administered online. Before completing this survey, participants input an access code in the *Participants Barriers to Elearning Scale*. The tracking code provided an opportunity to correlate the results of the pre- and post-assessment instrument data. At the end of the module, an online link back to the *User Interface Rating Form* allowed participants to provide feedback and submit the post-instrument. This process was repeated for the second field trial with the same sample of participants and only the User Interface Rating Form was administered in Field Trial Two.

Summative Instrument Reliability Analysis

Field Trials Summary

The use of two field trials allowed for technical and pedagogical testing and revision to the developed module. The process for both field trials was geared toward program revision and enhancement. All programs were delivered via CDROMs and then distributed to the Field Trial participants. All instrument data was collected via online survey with WebSurveyor and analyzed using SPSS. The results of these measures are reported in Chapter 4: Results.

CHAPTER 4: RESULTS

Introduction

The collection of design data began in Phase 2: *Design* with reviews by an expert panel of LET facilitators on the module performance objectives, storyboards, and simulation solution feedback. The transition from Phase 2: *Design* to Phase 3: *Development* occurred during a pilot test conducted with one-on-one reviews supported by observations and interviews. The formative data for Phase 3: *Development* occurred in two (2) field trials of the module with one target group. The formative data collected from participants in these field trials supported ongoing revisions to the module and provided critical data for a summative analysis of the design and development process.

Expert Review Panel

The Expert Review Panel represented five GTI Leader Effectiveness Training facilitators selected from volunteer responses to an email requesting volunteers. The panelists that participated are shown in Table 7.

Table 7

Panelists on the Expert Review Panel.

Director/Corporate Facilitator	St. Joseph's Health Care	Ontario, Canada
LET Trainer/Consultant	Coastline Training & Development, Inc.	Maryland
President/CEO/Author	Gordon Training International, Inc.	California
Director Client Relations/ Facilitator	Gordon Training International, Inc.	California
LET Trainer/ Consultant/Author	IMI Designs	Dublin, Ireland

General Results from the Expert Review Panel

The data from the Expert Review Panel suggested results shown in Table 8.

Table 8

General results of Expert Review Panel.

1	Performance objectives should focus on intellectual skills and cognitive strategies as learning outcomes.
2	Instructional strategies such as media-based content, simulations, and video-based credibility statements were preferred by participants.
3	General navigational and content areas from program storyboards accepted by Expert Review Panel.
4	Based on storyboards, participants should have option to assess out of review modules and proceed to simulations.
5	Simulation scripting is best evaluated for feedback at more visual levels.
6	Development of simulation scenarios occurs in layers to offer continued feedback and re-scripting for best results.

Expert Review Panel Analysis of Performance Objectives

In the design stage, performance learning objectives were derived from the use of a self-designed tool called a Learning Goal Worksheet for designer documentation of the learning goal, performance, conditions, outcomes, and criterion (Gagne et al., 1988). The learning goal worksheets (Appendix B) for the LET review modules and the sim-modules supported the designer's ability to remain focused on the designated learning competencies and learning goals. The Expert Review Panel was provided an online survey along with copies of the LET Learning Goal Worksheets [Appendix A]. The panelists were requested to evaluate both learning outcomes and instructional strategies for each of the LET learning competency objectives as shown in Table 9.

Table 9

Learning outcomes selected for each objective by Expert Review Panel Performance Objective Questionnaire (Appendix A)

Questionnaire Item	LET Learning Competencies (Select All that Apply)	Intellectual Skills	Cognitive Strategies	Verbal Information	Psycho-Motor Skills	Attitudinal
		n = 5				
1. Behavior Window and Problem Ownership: *Define Learning Outcomes*	1. Determine who "owns the problem" in a given situation.	5	5	4	0	3
	9. Distinguish between Acceptable and Unacceptable Behavior.	4	3	3	2	1
3. Active Listening: *Define Learning Outcomes*	3. Distinguish between Roadblocks and Active Listening.	5	5	4	1	3
	4. Avoid the Roadblocks that cause most helping attempts to fail.	3	4	4	1	3
	5. Recognize when team members need your help as a skilled listener.	3	2	3	2	3
	7. Active Listen to hear another's feelings.	2	2	3	2	4
	8. Active Listen to clarify information.	2	2	2	1	2

Table 9 (continued)

Learning outcomes selected for each objective by Expert Review Panel Performance Objective Questionnaire (Appendix A)

Questionnaire Item	LET Learning Competencies (Select All that Apply)	Intellectual Skills	Cognitive Strategies	Verbal Information	Psycho-Motor Skills	Attitudinal
		n = 5				
5. Confrontive I-Message: *Define Learning Outcomes*	11. Review of a three-part Confrontive I-Message	3	4	4	2	1
	12. Construct a Confrontive I-Message	3	3	4	1	3
7. Shifting Gears: *Define Learning Outcomes*	13. Shift Gears between I-Messages and Active Listening when appropriate.	4	3	3	1	3
Questions 1,3, 5, & 7	M±SD	3.4±1.07	3.3±1.1	3.4±.70	1.3±.67	2.6±.97
	Max.	5.0	5.0	4.0	2.0	4.0
	Min.	2.0	2.0	2.0	.00	1.0

Table 9 (continued)

Instructional strategies selected for each objective by Expert Review Panel Performance Objective Questionnaire (Appendix A)

Questionnaire Item	LET Learning Competencies (Select All that Apply)	Info matching	Decision making (multiple choice)	Case study	Scenarios to define principles or skills	Text-based content delivery	Media-based content delivery	Interactive simulation of scenarios	Video-based experience by LET graduates	Student reflection/ journaling
			n = 5							
2. Behavior Window and Problem Ownership: *Define Learning Strategies*	1. Determine who "owns the problem" in a given situation.	4	5	4	4	3	5	4	4	4
	9. Distinguish between Acceptable and Unacceptable Behavior.	4	2	4	4	4	4	5	5	5
3. Active Listening: *Define Learning Strategies*	3. Distinguish between Roadblocks and Active Listening.	4	4	2	3	3	3	3	3	3
	4. Avoid the Roadblocks that cause most helping attempts to fail.	2	3	3	4	3	3	3	3	3

Table 9 (continued)

Instructional strategies selected for each objective by Expert Review Panel Performance Objective Questionnaire (Appendix A)

Questionnaire Item	LET Learning Competencies (Select All that Apply)	Info matching	Decision making (multiple choice)	Case study	Scenarios to define principles or skills	Text-based content delivery	Media-based content delivery	Interactive simulation of scenarios	Video-based experience by LET graduates	Student reflection/ journaling
			n = 5							
3. Active Listening: *Define Learning Strategies*	5. Recognize when team members need your help as a skilled listener.	2	2	2	3	4	4	3	3	3
	7. Active Listen to hear another's feelings.	1	2	2	3	3	3	3	4	4
	8. Active Listen to clarify information.	1	2	2	3	3	3	3	4	3
5. Confrontive I-Message: *Define Learning Strategies*	11. Review of a three-part Confrontive I-Message	2	3	2	3	3	3	4	3	2
	12. Construct a Confrontive I-Message	1	3	4	3	3	3	3	3	3

Table 9 (continued)

Instructional strategies selected for each objective by Expert Review Panel Performance Objective Questionnaire (Appendix A)

Questionnaire Item	LET Learning Competencies (Select All that Apply)	Info matching	Decision making (multiple choice)	Case study	Scenarios to define principles or skills	Text-based content delivery	Media-based content delivery	Interactive simulation of scenarios	Video-based experience by LET graduates	Student reflection/ journaling
			n = 5							
7. Shifting Gears: *Define Learning Strategies*	13. Shift Gears between I-Messages and Active Listening when appropriate.	1	2	3	3	3	4	4	3	3
Questions 1,3, 5, & 7	M±SD	2.2±1	2.8±1	2.8±.91	3.3±.48	3.2±.42	3.5±.71	3.5±.71	3.5±.71	3.3±.82
	Max.	3.1	0	4.0	4.0	4.0	5.0	5.0	5.0	5.0
	Min.	1.0	2.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

In this questionnaire, the panelist all indicated that the learning outcomes should focus on intellectual skills and cognitive strategies with less focus emphasized towards psycho-motor skills The questionnaire addressed nine (9) instructional strategies to apply towards this learning module. Of the nine instructional strategies, the Panel all indicated that media-based content, interactive simulations of scenarios, and video-based experiences provided by LET graduates were the most critical. The use of student reflection/ journaling and scenarios to define principles of the skills were the next most critical focus areas. The use of information matching as a learning outcome was the least indicated strategy by the Panel. These results are descriptive in nature of the group's feedback.

Expert Review Panel Feedback on Storyboards

The storyboards offered an artistic rendition, interface, and technological draft for the developer to apply in the computer-based modules. The ability for the program to achieve learning mastery or reinforcement is dependent on sound learning objectives and detailed storyboards during module design. The storyboards provided the designer a screen by screen view and navigational properties of the review module content. In addition, the sim-modules required extensive storyboarding to encompass the interpersonal actions and responses within a typical interpersonal interaction. The storyboard serves as a communication vehicle among the designer, developer, and key stakeholders. It allowed the processes to be validated and approved by stakeholders prior to the time and monetary investments of content development. The storyboards were created with PowerPoint providing a blueprint of information on the visual components, navigational, audio, video, graphical and simulation, data tracking, and interactive activities.

After submitting copies of the storyboards [Appendix B], feedback on the review module storyboards was received via email and telephone conversations. The overall comments were favorable on the interface instructional designs. In general, the feedback was content-intensive with minor feedback on the use of LET terminology and grammatical errors. A significant amount of the feedback focused on differentiating between the various levels of the Behavior Window, an LET tool. The only instructional feedback was that an assessment should be used to support the user's learning and the ability to bypass review modules used as a participant option. The only interface design issue was a need to highlight the four learning stages as covered in the classroom version of the program.

Results of Expert Review Panel Feedback on Simulation Flow Charts

The simulation solutions and paths were presented to the Expert Review Panel in a graphical flowchart format to support the evaluation process. To obtain feedback via purely text-based simulations would not offer a view of the multiple levels of interaction and choices. A decision was made during the design process to provide the Expert Review Panel graphical views of the possible paths, solutions, and responses as found in Appendix B. In this assessment, the formative collection of data served to continually update the modules through all of the phases of design and development. The simulation flow for the three case studies were well accepted by two of the panelists, which one reported, "that the flow works very well, the content was exciting"and "the program is excellent work". It was suggested by one panelists that the simulations "allow the learner to get pretty far into the process before finding out their choices were not the best". It was recommended that the participant receive feedback earlier on and that they go to

journaling the problem before proceeding. A critical factor for participants is not only identifying what is wrong, and why, but to recognize appropriate choices. The panelists offered feedback on the simulation verbage regarding a need for more clarity on communication roadblocks, as defined by the LET program. The development of scripting for interactions involving conflict, listening, and other LET components was measurably a complex and challenging task. The scripting of appropriate and inappropriate choices required an iterative approach. It is difficult to develop these scenarios in one attempt opposed to cycles of analysis and revision. The more visual the provided script formats were, the better and more comprehensive the feedback from the panelists. As the scripted simulations were placed into the simulation programs with animated characters, additional feedback was generated and corresponding edits were applied to the programs.

Instrument Validation and Consistency by the Expert Review Panel

The question of content validity for the use of the two evaluation instruments comprises an important element for this research. In order to establish content validity on both instruments, feedback from the expert review panel was used. The intent to measure what is actually being measured can be achieved through several elements: asking if the research findings match reality; taking data back to the participants to determine plausibility; using multiple resources for data; observing over extended periods; involving participants in the research; and recognizing and addressing researcher bias (Merriam, 1998). To ensure that the indicators are homogenous within these instruments, the answers to three questions were sought: *Does the instrument define the characteristic the same way that I, or others, define it?*; *Does the instrument really measure the*

intended characteristic?; and *Does the instrument measure some other characteristics that it is not intended to measure?* (Aylesworth, 2002). Three participants of the Expert Review Panel indicated that the Participant Barriers to Elearning Survey and the User Interface Rating Form both measured the intended data sought in this research. The panelists also indicated that adequate description was provided to elicit the data. Two participants did not respond to the email requests.

Expert Review Panel Summary

In Phase 2: Design, an expert review panel was selected and information collected on both design methodologies, instructional strategies, and validation of program content. The design of the module relied on feedback from the Expert Review Panel on performance learning objectives, storyboards, and the simulation flow feedback. Several key findings noted were that performance objectives should focus on intellectual skills and cognitive strategies through media-based content, simulations. The program storyboards were acceptable to the Panel and it was noted that participants should be able to trest-out of the review modules. Simulation scripting was best evaluated at graphical and visual levels and should be continually developed in layers. The feedback provided by the Panel supports the transition between Phase 2: *Design* to Phase 3: *Development*. In the next section, the processes for data collection, course evaluation, and formative revision are defined.

Phase 3: Development

Review Module & SimulationDevelopment

The use of evaluation and data collection methodologies impacts both Phase 2: *Design* and Phase 3: *Development.* In this section, a description of key data collection strategies are applied including one-on-one reviews and field trials of the module.

One-on-One Reviews

General Results by the One-on-One Review Pilot

The data from the One-on-One Review suggested the results as seen in Table 10.

Table 10

General results of One-on-One Review.

1	Time and interruptions on professionals in manufacturing work environments challenge any efforts for follow-up or reinforcing training.
2	Participants seek direct feedback on progress through simulations.
3	Online or computer-based role-plays offer opportunities for the learner to explore communication choices with less stress and risk.
4	Navigational and ease of use are important design attributes.
5	Participants see the Review Module as an opportunity to supplement LET learning versus replacing the instructor-led format.

Results of one-on-one review observations.

Six Volvo managers were selected for testing of the module for the One-on-One Review sessions. The managers all completed an instructor-led LET workshop within the thirty-to ninety-day period at Volvo's New River Truck Plant, Dublin, Virginia. These participants were observed and interviewed separately during various shifts. The observation process included the following process as shown in Figure 30.

- Coordinate and schedule meeting with Volvo Human Resources contact
- Set up laptop(s) on-site at conference room
- Briefly explain process and purpose of research
- Offer instructions on how to initiate program
- Define parameters of support, only technical support will be provided and no content or navigational support
- Administer pre-program IRB Informed Consent and Elearning Barriers survey
- Observe participant completing program
- Administer post-program User Interface Rating Form survey
- Conduct interview with Interview Protocol Form and close session.

Figure 30. Steps for observation of small group sessions.

As mentioned earlier, the participants showed sufficient technical and computer skills to function within the program. Completion of the modules lasted from one hour to one hour and fifteen minutes. The participants required an estimated twenty minutes for the introduction and pre-program surveys. Actual participation in the Review Module program ranged from thirty to forty-five minutes with an additional twenty-five minutes for the simulations. One observation was that many of these managers found it difficult to avoid interrupting calls on their cell phones, which indicated manufacturing issues occurring in this environment. The participants progressed through the program effectively with the exception of two requests for on navigational issues involving URL links to the online surveys. The online surveys were not utilized in this session so participants were advised to bypass this event during the introduction. All of the participants spent an adequate amount of time on the decision point to move to the simulations and/or bypass the review modules. No intervention was administered by the researcher, but this observation contributed to the second version's use of more adequate

mapping of progress and navigational options. In the simulations, four of the six participants indicated some confusion afterwards on the navigational aspects in the simulation case study screen. The screen interface and navigational instructions was changed in the later version. The participants managed the simulations very effectively with little delay and most made multiple attempts at the simulation solutions. Key navigational points such as assessment, case studies, and URL links seemed to pose the largest delays and problems for participants. These navigational points required that the participant read a case study, and either take an assessment or click on a URL link to a survey before continuing. In most instances, the participants discovered the correct navigational move to continue in these cases. In one case instructions were offered on how to navigate past the URL link.

Results of one-on-one review interviews.

In the interviews that followed program completion, the participants offered valuable feedback on the module and learning needs. The key information provided during this phase was that the simulations needed more direct feedback versus the passive feedback of online coaches. The results of the interview questions can be found in Table 11.

Table 11

One-on-One Review interview results from Volvo managers at New River Volvo Truck Plant, Dublin, Virginia.

	Participant 1	Participant 2	Participant 3	Participant 4	Participant 5	Participant 6
Date of Interview	02/09/05	02/09/05	02/10/05	03/01/05	03/01/05	03/01/05
1. What is your current position?	Maintenance Advisor	Quality Advisor	Production Team Leader	Material Advisor	Supervisor Materials	Production Advisor
2. How many years and months in present position?	15 years	1 year 6 month	10 years	2 years	18 years	4 months
3. Please describe your use of the LET skills since the class-based workshop?	Have used skills in confrontations	Have applied, helps with work and home issues	I have used them on occaision.	Yes, the behavior window has helped me	Yes, more at home than work.	Yes, active listening helps with upset people and the confrontive I msg.
4. Please describe your first reaction to this LET Review Module and simulations?	I liked it, well laid out.	Works well and new way to learn	I wandered what I was doing here, I did not understand it was research.	Intrigued at first by the technology.	I think some people would have problems focusing, it is really individual motivation	I liked quizzes, and interactive events. I like having privacy to make mistake.

Table 11 (continued)

One-on-One Review interview results from Volvo managers at New River Volvo Truck Plant, Dublin, Virginia.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Participant 5**	**Participant 6**
5. Please describe your present opinions of LET Review Modules and simulations?	Same as first reaction, challenging simulations	Like the sims, do more less review and more simulations	Much better than first, now I understand. I like the program.	I find them interesting.	70% of people would gain from it, 30% are not interested.	Role-playing, I didn't know what you would get. Challenging.
6. Do you need additional training for the LET skills?	No need for follow-up training.	I think follow up is good.	No comment, (interruption)	Yes, periodically	Yes	Wouldn't hurt to review.
7. To what degree did you accomplish the performance objectives established for the LET Review Modules and simulations?	Yes, the flow was there and thought the review and questions supported each other.	Yes, simulation is greater than review modules. The flow was smooth through program. Characters are okay.	Yes, I accomplished the objectives.	I think I did, it brings back the terminology and concepts.	I found it easy to use, I think 80% of the objectives were accomplished.	Some ok, messed up some.
8. What would you tell another person about to take the LET Review Modules and simulations?	Easy to use, I think it is great. I like the coach and transfer.	I would like opportunity to review books before taking this.	I don't have an answer to that.	You can use 90% of the skills, especially the behavior window	-	Not to get hung up on technical points

Table 11 (continued)

One-on-One Review interview results from Volvo managers at New River Volvo Truck Plant, Dublin, Virginia.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**	**Participant 5**	**Participant 6**
Date of Interview	02/09/05	02/09/05	02/10/05	03/01/05	03/01/05	03/01/05
9. What improvements would you recommend for the LET Review Modules and simulations overall?	None particularly, movement keeps you active, not monotonous.	Potentially valuable, something for everyone.	No improvements .	None	Time is the issue, it could be difficult to complete.	Lip synch on sims and some textual errors.
10. What is your opinion of the interactive multimedia system used to deliver this course?	Interactive enough. Prefer hard versus soft feeback from coaches. I think doing online role-plays has potential.	I prefer instructor-led but this has potential for follow-up. Work on more simulations. Should get follow-up sooner than 90 days.	I think people could benefit from this approach.	Once through the class, I gained from learning in seclusion. Easy to focus and helps with stress of role-plays.	I like the toolbar and navigation, but you need to go back. Helps to do role-plays with computer.	As a supplement, it is good. Not as stand-alone.

Five of the six participants noted that they did not feel this instructional strategy should replace the instructor-led version of this program for the primary learning event. However, three of the five participants did comment that they really preferred the computer-based role-plays because they created less stress on peer observations of their performance. In one interview, this area was investigated further and the participant stated he felt he could take more chances with the virtual role-plays with less risk in keeping face. Three other participants responded that they became engaged with the simulations at that level.

Results of One-on-One Review Pre- and Post- Surveys

For each participant taking the first version of the LET Review Module, the *Participant Barriers to Elearning Scale* (Berge & Muilenburg, 2003) and *User Interface Rating Form* (Reeves & Harmon, 2003) surveys were administered via hard copy. The participants indicated a moderate likelihood of taking elearning in the future (M = 2.6) and that they predominately have no barriers, disabilities, or prejudices that would impact their feelings toward traditional instructor-led sessions (M = 1.8). On a scale of one equalling no barriers and five equaling very strong barriers, the One-on-One Reviews showed the strongest levels of barriers for infrastructure and support systems (M = 2.17). Technical (M = 2.15) and time/interruption issues (M = 2.13) were noted next as the highest level of barriers. The lowest level of reported barriers were social (M = 1.86) and prerequisite skills (M = 1.43). The overall level of barriers for elearning by participants was reported at a low to moderate level (M = 2.02) on a 5-point Likert scale .

For the post-module survey, the One-on-One Review participants completed the *User Interface Rating Form* (Reeves & Harmon, 2003) instrument. The instrument categories evaluated are defined in Table 12.

Table 12

Definitions for User Interface Rating tool.

User Interface Rating	Definition	Low Scale 1	High Scale 10
Ease of Use	The perceived facility with which a user interacts with an interactive multimedia program.	Difficult	Easy
Navigation	The perceived ability to move through the contents of an interactive program in an intentional manner.	Difficult	Easy
Challenging Content	The content is interactive and challenges learners to a level that cognitive load processing is interesting but manageable.	Unmanageable	Manageable
Logical Mapping of Progress	The program's ability to track and graphically represent to the user his or her path through the program.	None	Powerful
Screen Design	A dimension ranging from substantial violations of principles of screen design to general adherence to principles of screen design.	Non-functional	Functional
Content Knowledge	The expertise applied as the basis for the structure of the knowledge or information presented in the program.	Very Unknowledgeable	Very Knowledgeable
Information Presentation	The information contained in the knowledge space of an interactive program is presented in an understandable form.	Unclear	Clear
Use of Media	The level of coordination between the various media (text, graphics, audio, video, etc.) to work together to form one cohesive program.	Uncoordinated	Coordinated
Aesthetics	The artistic aspects of the interactive programs in the sense of how the program looks to the participant.	Unpleasing	Pleasing
Overall Functionality	An aspect of the interactive multimedia program as it relates to the perceived utility of the program.	Non-functional	Functional

The results of the *User Interface Rating Form* indicated the highest measures as content knowledge ($M = 8.8$) on a ten-point scale with ten equaling the highest levels of functionality for the given categories. The lowest measures were challenging content ($M = 7.6$) and ease of use ($M = 7.6$) as shown in the survey results in Table 13.

Table 13

One-on-One Review results of User Interface Rating Tool for Interactive Multimedia

Questionnaire Item:	Scale	M ± SD	Max.	Min.
	n = 6			
1. Ease of Use	Difficult 1 2 3 4 5 6 7 8 9 10 Easy	7.6±1.5	9.0	5.0
2. Navigation	Difficult 1 2 3 4 5 6 7 8 9 10 Easy	8.0±1.67	10.0	6.0
3. Challenging Content	Unmanageable 1 2 3 4 5 6 7 8 9 10 Manageable	7.6±1.4	9.0	6.0
4. Logical Mapping of Progress	None 1 2 3 4 5 6 7 8 9 10 Powerful	8.5±.84	10.0	8.0
5. Screen Design	Non-functional 1 2 3 4 5 6 7 8 9 10 Functional	8.5±1.22	10.0	7.0
6. Content Knowledge	Very Unknowledgeable 1 2 3 4 5 6 7 8 9 10 Very Knowledgeable	8.8±.75	10.0	8.0
7. Information Presentation	Unclear 1 2 3 4 5 6 7 8 9 10 Clear	8.5±1.04	10.0	7.0
8. Use of Media	Uncoordinated 1 2 3 4 5 6 7 8 9 10 Coordinated	8.2±1.83	10.0	5.0
9. Aesthetics, or the Look of the Program	Unpleasing 1 2 3 4 5 6 7 8 9 10 Pleasing	8.0±2.28	10.0	4.0
10. Overall Functionality	Non-functional 1 2 3 4 5 6 7 8 9 10 Functional	8.3±1.36	10.0	6.0

The participant's work environment offers a lack of upgraded computer technology, which could impact infrastructure, support, and motivational issues. The work environment is high-paced and creates a large number of interruptions from manufacturing issues, which might explain some of the denoted barriers. The results of the User Interface Rating Tool and Elearning Barriers for the One-on-One Review can be seen in Appendix G.

User preferences.

The One-on-One Review participants seemed to favor the use of this module as a supplemental training strategy and not as a stand-alone replacing the instructor-led version. Comments and observations indicated that the participants liked the simulations over the review modules. As the simulations offered flexibility and opportunity to take chances with less stress or risk. The participants also noted that the simulations were challenging and they liked the interactivity of the review module activities. One participant commented on the online Coach and the Transfer capabilities and the video-based statements by LET graduates.

User challenges.

The participants mostly reported that navigational problems were encountered with the case study, the URL link, and the assessment decision point to continue on or take the review modules. The feedback on performance in the simulation was designed for an computer-based coach to intervene and share what tools were missed and which would work better. One participant noted that the feedback should be more direct and immediate.

One-on-One Reviews Summary

The use of one-on-one reviews involved the selection of the participants, compilation of observational and interview data, and application of the feedback toward formative development. Through observations and interviews, it was determined that time and interruptions in the workplace are significant and elearning creates both challenges and opportunities. Participants offered feedback that the simulations necessitate more direct feedback on performance through the interactions. Many of the participants noted that online or computer-based role-plays offer learning opportunities that produce less stress and allow more exploration. The participants reported that the Review Module offers more opportunities as a program follow-up than stand-alone. The transition from Phase 2: *Design* to Phase 3: *Development* is strongly supported by the design data received from both the expert review panel and the one-on-one review sessions.

Field Trials

The data for each field trial was collected with the online survey tool, Websurveyor. The analysis of this phase of development offers less qualitative information as the interviews and observations, however, an audience representative of cultural diversity and management perspectives is available with the management team at Saint Joseph's Hospital in London, Ontario, Canada. This diverse sample is representative of the participants engaged in Leader Effectiveness Training and makes evaluative feedback from this audience even more valuable toward the focus of this research.

Field Trial One

General Results by Field Trial One

The data from Field Trial One suggested the following results in Table 14.

Table 14

General results of Field Trial One.

1	The actual interpersonal communications content is very important for this target population, how it is presented and the level of challenge is important..
2	Program orientation is necessary for participants to navigate and function effectively.
3	The overall look of the program and the effective use of media are critical factors for program satisfaction.
4	An inverse association between elearning barriers and user ratings continues to exist for the first Field Trial participants.

Results of Field Trial One Pre- and Post- Surveys

For each Field Trial participant taking the first version of the LET Review Module the *Participant Barriers to Elearning Scale* (Berge & Muilenburg, 2003) and *User Interface Rating Form* (Reeves & Harmon, 2003) surveys were administered via Websurveyor, an online survey tool [Appendix G]. In these results, several key demographic findings show that the first Field Trial participants are moderately comfortable with elearning ($M = 2.8$) on a 5-point Likert-scale. These participants indicated little or no barriers, prejudices, or disabilities with traditional instructor-based classes ($M = 1.9$) with a scale of 2 represents no barriers. The Field Trial participants indicated the strongest barriers in social ($M = 2.64$) areas which permits open learning environments and community support from other learners. The use of asynchronous

strategies could contribute to this factor in that no computer-based communication technologies are applied. Unlike the One-on-One Review sessions, the participant completed the module in isolation. In addition to social, the Field Trial participants reported higher barriers for motivation (M = 2.0) and time/interruptions (M = 2.21). The lowest barrier to elearning was the need for prerequisite skills (M = 1.42) for learning. The overall barriers to elearning for the Field Trial group was reported at a level representative of weak barriers (M = 1.96).

The overall results of the *User Interface Rating Form* indicated the highest usability measures in content knowledge (M =8.7) on a ten-point scale with ten equaling the highest functionality. This rating was followed by challenging content, and information presentation. The lowest overall measures were in the use of media (M = 6.8) and aesthetics (M = 7.3) on the ten-point scale. The results of the *User Interface Rating Form* surveys are shown in Table 15.

Table 15

Results of Field Trial 1User Interface Rating Tool for Interactive Multimedia (Appendix G)

Questionnaire Item:	Scale	M ± SD	Max.	Min.
	n = 14			
1. Ease of Use	Difficult 1 2 3 4 5 6 7 8 9 10 Easy	7.75±2.45	10.0	3.0
2. Navigation	Difficult 1 2 3 4 5 6 7 8 9 10 Easy	7.08±2.11	10.0	3.0
3. Challenging Content	Unmanageable 1 2 3 4 5 6 7 8 9 10 Manageable	8.54±1.51	10.0	6.0
4. Logical Mapping of Progress	None 1 2 3 4 5 6 7 8 9 10 Powerful	7.36±1.75	10.0	4.0
5. Screen Design	Non-functional 1 2 3 4 5 6 7 8 9 10 Functional	8.0±1.86	10.0	4.0
6. Content Knowledge	Very Unknowledgeable 1 2 3 4 5 6 7 8 9 10 Very Knowledgeable	8.7±.1.49	10.0	6.0
7. Information Presentation	Unclear 1 2 3 4 5 6 7 8 9 10 Clear	8.18±1.40	10.0	6.0
8. Use of Media	Uncoordinated 1 2 3 4 5 6 7 8 9 10 Coordinated	6.8±2.72	10.0	1.0
9. Aesthetics, or the Look of the Program	Unpleasing 1 2 3 4 5 6 7 8 9 10 Pleasing	7.3±1.96	10.0	3.0
10. Overall Functionality	Non-functional 1 2 3 4 5 6 7 8 9 10 Functional	7.4±2.86	10.0	4.0

The first Field Trial group showed the highest usability measures for challenge of the content and content knowledge, followed by the information presentation, which differs, from the One-on-One Review's high ratings on navigation and program orientation. This indication by the descriptive statistics indicates a level of satisfaction on content-related rating categories by the participants in Field Trial One. The One-on-One Review group's focus primarily involved satisfied ratings with navigational and ease of use ratings.

User preferences..

The *User Interface Rating Tool* indicates the highest measures for content knowledge ($M = 8.7$) on a scale of ten (10) representing very knowledgeable. In addition, several other high measures are representative of challenging content, information presentation, and screen design. The overall categories of usability preferred by the participants were content-focused.

User challenges.

The lowest measure was for the use of media ($M = 6.8$), followed by navigation, aesthetics, and logical mapping of progress. In this module, navigation and program orientation appear to categorize the overall needs of the participants along with effective use of media. In LET Review Module 1, no video applications were used nor did the program format offer screen index provisions to allow easier movement. In the simulations, feedback by the online coach was provided without any quantitative or visual representation of progress. Each of these attributes could impact measures related to logical mapping, ease of use, and navigation.

Design Changes

The changes in LET Review Modules One are a direct result of the content-focused needs by both groups and for program orientation needs by Field Trial One. In LET Review Module One, audio-based media was applied along with the animated simulations. In order to support the use of media and the general aesthetics, the use of video was applied to offer credibility statements from graduates as defined by Kass, Burke, Blevis, & Williamson (1993) in their Guided Social System program. The videos were shot with a Sony Digital camera highlighting local LET graduates that were prompted to speak on LET topics. The video segments are aligned with specific topic areas within the program in order to add both credibility and tips on how to actually transfer the skills to the "real world". The video segments are administered by the use of the TRANSFER button found on the screen interface as shown in Figure 31.

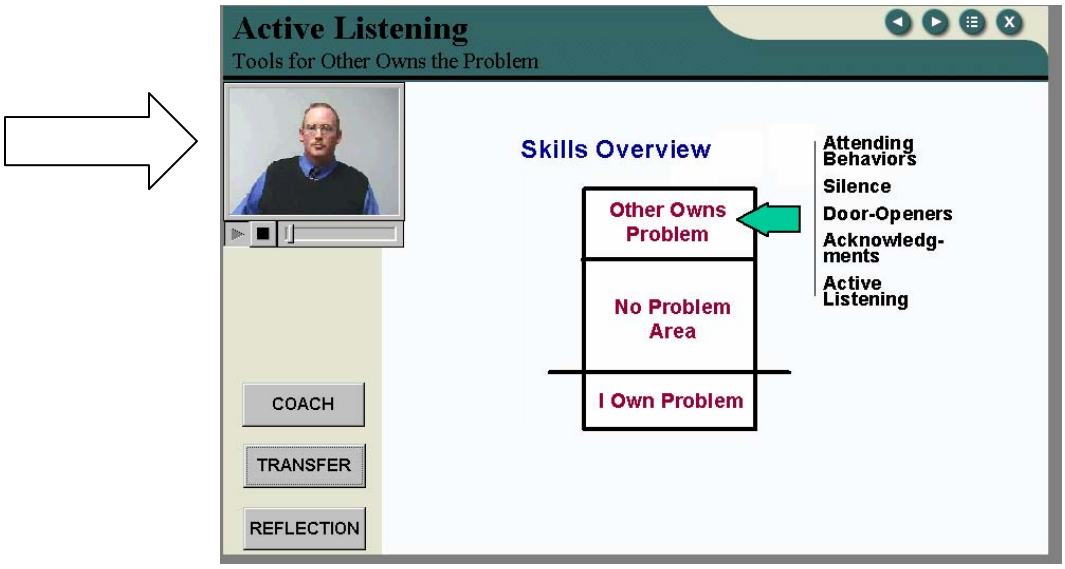

Figure 31. Use of video by clicking on the transfer button in LET Review Module 2.

Program orientation needs are defined by Allen (2003) in what he refers to as his Navigation Imperatives: "Let learners see the boundaries of their universe; let learners see how the content is organized; let learners see where they are; let learners go forward;

let learners backup; and let learners correct themselves" (p. 232). A new program orientation interface was applied to the program to support these navigational needs as shown in Figure 32.

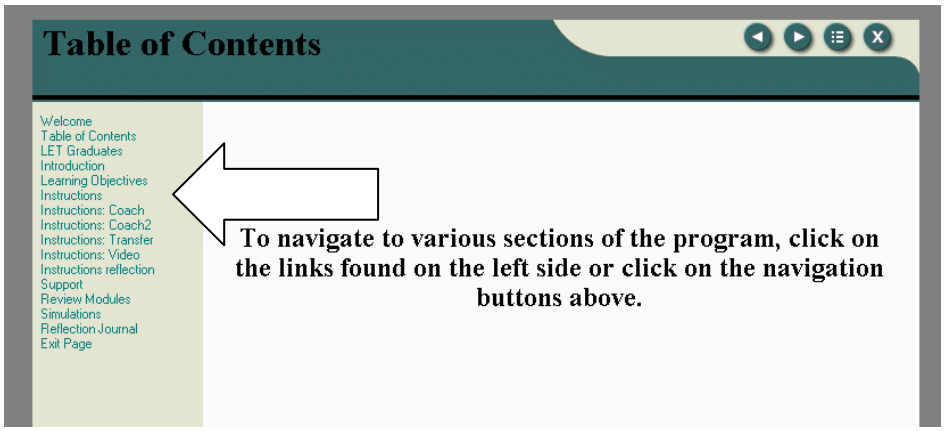

Figure 32. Use of table of contents and navigational interface for LET Review Module 2.

Also, in the One-on-One Review interviews a need was defined as more concrete feedback on simulation progress. Allen (2003) speaks to the need for intrinsic feedback and motivation for learners in elearning modules. In the second version of the LET Review Module, progress bars were added to the animated simulations to allow learners to orient themselves better and to maintain a level of challenge for higher scores as shown in Figure 33.

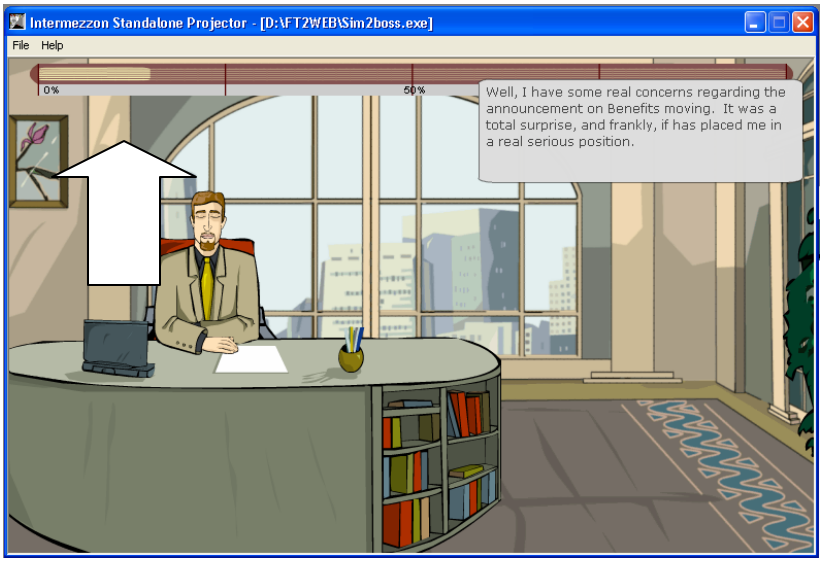

Figure 33. Progress bars added to simulations for progress tracking and intrinsic motivation.

These three changes represent the most complex and significant revisions made to the module following Field Trial One. A number of content, grammatical, navigational, and aesthetic changes were made because of One-on-One Review and Field Trial One feedback. The updated module, LET Review Module 2, was shipped back to the facilitator contact at Saint Joseph's Hospital for a final pilot test. The data from Field Trial Two is provided in the following section and is the final pilot conducted for this study.

Field Trial Two

General Results by the Second Field Trial

The data gathered in Field Trial Two indicates the results seen in Table 16.

Table 16

General results of Field Trial Two.

1	A consistent inverse relationship exists between participant's barriers to elearning and usability ratings throughout multiple groups and field trials.
2	The overall presentation of content including screen design, aesthetics, challenging content, and content knowledge were well received by participants.
3	Ease of use and navigational attributes, including use of media, did not meet needs of target audience.
4	Even within one organization, inconsistent technical capabilities remain high.
5	Navigational and ease of use attributes greatly impact overall view of program, regardless of high evaluations on challenging content and presentation value.
6	Restructuring and more direct feedback contribute to increase in participant's view of challenging content and program presentation.

Results of Field Trial Two Post-Module Survey

In Field Trial Two, eleven participants completed the modules and completed the *User Interface Rating Form.* The participants in this session were not re-administered the *Participant Barriers to Elearning Scale* survey. The results of the *User Interface Rating Form* showed the highest functional usability measures in the area of challenging content (M =9.1) on a ten-point scale with ten as the highest functionality. The next highest usability categories were logical mapping of progress, content knowledge, and screen design. Several key comments received following Field Trial Two on the *User Interface Rating Form* were: "module consistent with information taught"; "powerful mapping"; "like being able to go back"; "good review of LET training"; "good for post-class instruction"; and "easy for beginning computer person". The lowest measures on the usability scale were in ease of use (M = 5.6), navigation (M = 6.4), and use of media (M =

7.0) on the same ten-point scale. Several key comments made in the lower response categories were: “hard to navigate”; “could not type in reflection journal”; “simulation rating difficult to follow”; “more direction needed”; “a lot of pausing and double clicking”; “stilted animation design”; “interface response consistency poor”; and “still has bugs but is better than last version”. Field Trial Two evaluations showed significant improvements in the areas of program content and presentation of information. The first Field Trial group showed the most favorable measures in challenge of content and content knowledge, followed by information presentation. The One-on-One Review’s focus was on navigation and program orientation areas. The results of the *User Interface Rating Form* surveys are shown in Table 17.

Table 17

Results of Field Trial 2 User Interface Rating Tool for Interactive Multimedia (Appendix G)

Questionnaire Item:	Scale	M ± SD	Max.	Min.
	n = 11			
1. Ease of Use	Difficult 1 2 3 4 5 6 7 8 9 10 Easy	6.0±2.44	10.0	1.0
2. Navigation	Difficult 1 2 3 4 5 6 7 8 9 10 Easy	6.7±1.70	10.0	4.0
3. Challenging Content	Unmanageable 1 2 3 4 5 6 7 8 9 10 Manageable	9.3±1.25	10.0	6.0
4. Logical Mapping of Progress	None 1 2 3 4 5 6 7 8 9 10 Powerful	8.6±1.34	10.0	6.0
5. Screen Design	Non-functional 1 2 3 4 5 6 7 8 9 10 Functional	8.9±1.52	10.0	6.0
6. Content Knowledge	Very Unknowledgeable 1 2 3 4 5 6 7 8 9 10 Very Knowledgeable	8.9±1.10	10.0	7.0
7. Information Presentation	Unclear 1 2 3 4 5 6 7 8 9 10 Clear	9.5±.71	10.0	8.0
8. Use of Media	Uncoordinated 1 2 3 4 5 6 7 8 9 10 Coordinated	7.1±3.07	10.0	1.0
9. Aesthetics, or the Look of the Program	Unpleasing 1 2 3 4 5 6 7 8 9 10 Pleasing	8.7±1.34	10.0	7.0
10. Overall Functionality	Non-functional 1 2 3 4 5 6 7 8 9 10 Functional	6.3±2.87	10.0	1.0

User preferences.

The overall presentation of content including screen design, aesthetics, challenging content, and content knowledge were well received by participants. It is clear that acceptance of this form of learning for this audience is highly dependent on the technical capabilities and interface effectiveness.

User challenges.

The ease of use and navigational attributes, including use of media, did not meet the needs of the target audience. Inconsistent technical capabilities could offer some explanation to this fact, however, technical and infrastructural support systems were not indicated as high elearning barriers for this target audience. It could be said that navigational and ease of use attributes greatly impacted overall perspectives on this form of learning.

Field Trials Summary

Two field trials allowed for technical and pedagogical testing and revision to the developed modules and were geared toward program revision and enhancement. The data collected from these participants was correlated with a Pearson Correlation to establish how barriers to elearning impact formative feedback scores. The sample sizes fluctuated in all groups due to scheduling and response issues within the organizations. The field trials were administered with managers, and recent LET graduates, from St. Joseph's Health Care, London, Ontario, Canada. The human resources facilitator and contact with this organization volunteered graduates from recent programs where LET was facilitated between 30 and 90 days prior to this treatment. All programs were

delivered via CDROMs shipped to the contact and then distributed throughout Ontario to the managers in St. Josephs Health Care system. All instrument data was collected via an online survey with WebSurveyor and analyzed using SPSS.

An overview of the data collected indicates that elearning barriers were shown to be higher for the One-on-One Review (Volvo) participants than the Field Trial (St. Joseph's) participants. The usability ratings were higher for One-on-One Reviews than both Field Trials. The Field Trials showed some improvement in the ratings on the second version as shown in Table 18.

Table 18

Evaluation matrix of descriptive statistics.

	Survey of Participant Barriers to Elearning Scale (Group Means)	**User Interface Rating Form** (Group Means)
		n = 4
Expert Review Panel	-	-
		n = 6
One-on-One Reviews	2.02±.45	8.20±1.40
	n = 14	n = 12
Field Trial One	1.96±.99	7.71±2.01
	n = 11	n = 11
Field Trial Two	-	8.0±1.73
Overall Average	1.99±.72	7.97±1.71

The *User Interface Rating Form* offered the primary feedback on program effectiveness and acceptance. The One-on-One Reviews showed the highest markings in content

knowledge, progress mapping, and presentation of information similiar to Field Trial One's evaluations. In addition, the introduction of video-based credibility statements contributed towards evaluative measures and remarks on content knowledge, aesthetics, and challenge but added more technical concerns such as use of media, navigation, and making an impact on overall scores as shown in Figure 34.

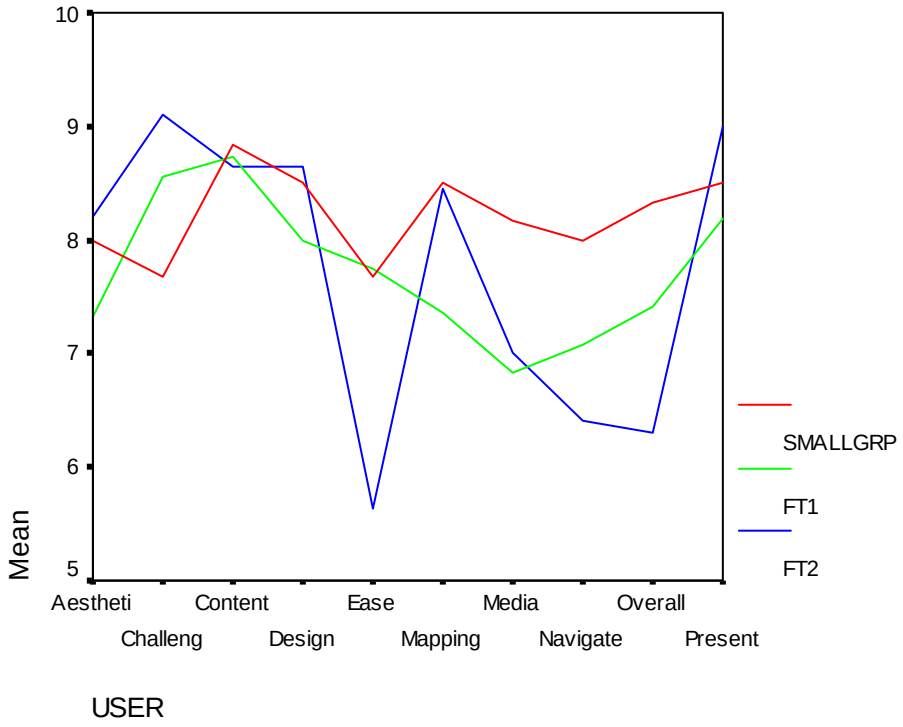

Figure 34. Overview of usability interface ratings from all study groups.

Some of these evaluative levels might be explained by technical interface issues occurring between the use of video- and audio-based files. One media format overrides the other and cannot be shown at the same time. The overall results indicated higher acceptance of usability in content-based areas and navigational and technical issues represent the lower ratings in usability. Although no significant conclusions can be drawn from the quantitative data obtained due to sample size, the inferences support interview and observational data. It is hopeful that these evaluative measures are

indicative of the potential for student learning despite measures regarding technical elements. However, it is clear that online asynchronous learning's future and success are highly dependent on the technical functionality of the program and the interface design of such instructional modules.

CHAPTER 5: DISCUSSION

A student's learning from the environment requires allowing the environment to do the teaching…..(Skinner, 1968)

Introduction

The focus of this research was the development of an asynchronous computer-based review module on interpersonal skills training for an adult, professional target audience. The content of the program was derived from interpersonal skill development currently delivered via an instructor-led format through a commercial provider, Gordon Training International, Inc. The classroom-based instruction encompassed a three-day leadership program entitled, Leader Effectiveness Training delivered throughout the United States and other countries. The development of this review module was a first step toward measuring the impact of post-class instructional strategies on learning retention and transfer in future research. In addition, this module provides an opportunity to document and analyze the processes for review module development, specifically for interpersonal communication content. This chapter includes descriptive information on the methodology, processes, content, evaluation instruments, and tools applied in the development of the module.

Type 1 Developmental Research Goals

The collection of data in three phases of this project supported the formative development of the asynchronous learning module. As previously defined, the research question for this developmental study is:

What are the theoretical and practical considerations for effective design, development, and evaluation of an asynchronous post-instructional learning review module for interpersonal skills?

The conclusions sought in this study seek to define improvements in the instructional product, define conditions that promote successful use of the product, and define conditions conducive to efficient design for future products of this contextual nature. These conclusions are dependent on the various forms of data collection used for primary feedback on program effectiveness and acceptance. The findings by the One-on-One Review group showed the highest markings in content knowledge, progress mapping, and presentation of information , which is comparable to Field Trial One's evaluations. Field Trial Two (same participants as Field Trial One) indicated a shift in ease of use with the new format introduced which had a more logical mapping approach. The introduction of video-based credibility statements and simulation progress measurements contributed towards evaluative measures and remarks on improved content knowledge, aesthetics, and challenge. However, these revisions added more technical concerns such as decreased ease of use, use of additional media, and challenges in navigation. In an effort to define some of the findings identified through this research, the limitating and de-limitating elements of this study must be considered.

Limitations of Study

In seeking to replicate interpersonal interactions between professionals, the complexity of the interaction became very obvious. Even with a branching-style of simulation, as created with Intermezzon Designer, it became obvious that limitations exist as to how many levels of responses and reactions can be represented. Equally, in

the use of animated computer-based agents to represent people in these scenarios, technology drives the limits on how life-like a character can appear and the levels of realism. In this research, certain limiting factors restraining the levels of realism were related to time, budgetary, technical capabilities, and end-user technical resources.

Despite the designer's efforts to avoid media comparison studies between instructor-based and computer-based learning strategies, the learners and training managers intuitively evaluate programs on this comparative basis. The lack of research on attributes for learning and their impact on retention and skill transfer in the workplace contributed to this limiting factor, but also presented itself as an opportunity for future research. As shown through the descriptive evaluation research, the study groups in this research reflected the overall time and commitment challenges faced in today's work environment. In observations of the initial one-on-one pilot testing, the reasoning behind lack of training follow-up became apparent based on the interruptions and work-place demands on these learners. In essence, very little "tuning" exists after initial exchanges of knowledge in many professional environments as defined by the American Society for Training and Development (Sugrue, 2003). This challenge is specifically true for leadership training in interpersonal communications. The pilot of this asynchronous review module highlighted this limitation by organizations, but also highlighted the opportunity it presents for organizations. Finally, the ability to drill below the surface on user interface rating results and comments with the Field Trial participants was limited due to distance (Ontario, Canada) and availability of their time. Like many of the limitations defined previously, these elements also are representative of an opportunity to further understand the effects of distance of time and place between learner and instructor/ designer in the instruction of interpersonal communications.

De-limitations of the Study

As mentioned above, some limitations for this research are dual-sided in that they present opportunities for future research and effectively replicate the actual learning environment. With regards to the complexity of designing interpersonal interactions for scenario-based learning, this process illustrated the need for layers of design and formative feedback. In this research, the Expert Review Panel feedback on instructional objectives, storyboards, simulation paths, and instruments offered invaluable help in achieving levels of realism and content accuracy. The design applied pilot tests to continue to remove layers unveiling realistic scenarios. This level of realism was required not just for the content and scenarios, but also for the computer social-agents.

The acceptance of realism of computer-agents or characters, as applied with Flash animations in this project, was dependant on several factors. As referenced in this study, lower fidelity visual images on the screen were evaluated no differently than higher-fidelity images (Reeves & Nass, 1996). In fact, audio fidelity is much more critical than video or graphical fidelity in media-based personalities. As stated in the limitations for the study, program evaluation on the learning and acceptance of this content was conducted at a true distance in time and place. The usability ratings reported by the One-on-One Review group varied significantly from the Field Trial groups. The One-on-One participants had available support in the room by this researcher despite instructions that no content or navigational guidance would be provided. The usability ratings were indicative of this presence as compared to the Field Trial sessions which were established individually. This environment offered the chance to evaluate distance learning with consideration of many of the barriers and challenges that participants face in asynchronous learning, therefore removing the limitation of testing under realistic

circumstances. In addition, these limitations and de-limitations offer direction for future research on the use of asynchronous modules as follow-up to training in interpersonal communications.

The Design Process

The use of layers of content design required continued involvement by evaluative groups and constant alignment with the learning performance objectives. As in any training design, learning objectives serve as the compass for knowledge acquisition and restructuring. In visually-enhanced learning environments, the link to distinct performance objectives remains even more critical to avoid going down irrelevant paths. The design of this program also followed previous research findings that indicated the effectiveness of judging and feedback with the support of video (Weller & Blaiwes, 1977), the ability for learners to achieve mastery through active learning with decisions and cognitive reflection made through online alternative choices supported by immediate feedback (Schroeder, 1986), the applications of conversational models with opportunities for reflection for cognitive structuring (Holsbrink-Engels, 1997), and providing a learning environment replicating a "social moratorium" (Gee, 1993).

As mentioned earlier in this study, the ability to provide learning in separate places and separate times without real-time involvement by the instructor remains a key advantage of asynchronous strategies. The challenge for the designer is offering instructional opportunities and motivation to engage the learner actively as opposed to passive engagement (Spiceland, Hawkins, & Charlene, 2002). The challenge for computer-based learning is to allow for feedback and reinforcement to fuel learner motivation (Spiceland & Hawkins). Learning through interactive methods can increase

motivation, promote collaboration, develop persistence in problem solving, allow for more depth of understanding, and increase the ability to explore (Harlamert, 1998 , p. 7). An additional driving force for asynchronous learning is that signs and senses include the effects of time, that when learners can take as much time as they wish learning is enhanced (Levie& Dickie,1973). Allen (2003) speaks to elearning design as requiring distinct learner-interface design elements, to: "Minimize memory burden, minimize errors, minimize effort, promote features, and contribute to the learning process" (p. 71). In this design process, these elements were reflected by the levels of feedback received from Field Trials One and Two. The general findings showed the necessity for program orientation to allow participants to navigate and function effectively. Interface design greatly impacted the Field Trial participant's overall view of the program, regardless of positive evaluations related to the content and its presentation. Navigation and ease of use factors are important design attributes that minimize what technological operations the learner must focus on so not to compete with the instructional message.

A second design factor that was reflected in formative feedback through observation and interviews was the need for more direct feedback in the simulations. The initial version applied an intermittent feedback session by a simulation coach to offer feedback on LET techniques and levels of success. Feedback from One-on-One Review participants indicated a need for more direct feedback on progress and success. The feedback on incorrect answers has a stronger impact than sharing the correct answers (Levie & Dickie, 1973). In an effort to accomplish this, the second field trial version added a progress bar for the simulations to provide intrinsic motivation and logical mapping of progress. User interface ratings indicated an improvement in this area from Field Trial One (M = 7.36) compared to Field Trial Two (M = 8.5). The challenge for the

designer was offering instructional opportunities and motivation to engage the learner actively as opposed to passive engagement. The challenge for computer-based learning is to allow for feedback and reinforcement to fuel learner motivation (Spiceland & Hawkins, & Charlene, 2002). In a video game-like interface as the progress bar imitates, the learner is allowed opportunities to build on anticipated outcomes and to put the learner at risk (Allen, 2003). The potential for multiple path and progress accomplishments supported the intrinsic motivation required by learners to re-try the simulations until reaching a score of 100%. Feedback from the formative data indicates higher usability ratings after restructuring content in the simulations and providing more direct feedback. These changes aligned with the participant's increases in ratings on the challenge of the content, presentation of the information, and overall aesthetics of the program.

The Development Process

The two versions of LET Review Module were developed in Toolbook II developmental software and linked with practice scenario-based simulations developed with Intermezzon Designer. The modules were developed for delivery on CDROMs with only a link saving to the local PC and all media/content files housed on the CDROM. The program incorporated graphics, interactive events, video, audio, and URL links for data collection instruments. Decisions to deliver via CDROM versus online distribution was due to the diversity of technical capabilities available to the field trial groups and bandwidth issues for media delivery. These parameters required that the development process focus on a multitude of technical issues to optimize program functionality and acceptance. As reported in the general findings, the overall look of the program and the

effective use of media are closely aligned with program satisfaction. Ease of use, navigational attributes, and use of media did not optimally meet the needs of the target audience. One outlier response was received in Field Trial Two which offered extremely low quantitative measures contributing to the large discrepancy in means for usability ratings. However, the comments from this participant offered some of the most constructive feedback. Developmentally, changes were made to the interface of the program with the use of the Transfer buttons, which may have affected use of media measures. The use of the video selections created some overlap with audio files that played automatically, also possibly contributing to this feedback.

In development, the design vision was transferred to an interface with visual and audio engagement and interactivity. To apply these strategies and technologies toward learning interpersonal skills required a strong emphasis on removing navigational and instructional obstructions to the learning. For participants to move to practice sessions that develop these higher order skills, the program must be developed to a level that offers little or no competition on their focus, attention, and decision-making. Goldman (1991) denotes a general instructional prescription derived from computer-based learning that, "the format in which materials are presented should do as much of the extraneous work for the learner as possible" (p. 335). Presentation formats should not require the learner to focus on the delivery and interactivity tools but focus on the content (Campbell, 1995). In other words, focusing on a double-click or being lost in navigational turns corrupts the focus and attention required to engage learners in ill-structured problem solving, which is how interpersonal communications have been defined (Jonasson, 1997). The power of this form of learning to make learning

individualized opens doors for explorative learning with fewer social risks and anxiety. The effort for smooth and flawless development is a worthwhile cause.

The Delivery Process

As reported through the instrument, *Participant Barriers for ELearning,* lack of time and interruptions ($M = 2.21$) in the workplace offered the second highest levels of barriers to elearning with social issues ($M = 2.64$) as the highest on a 5-point Likert scale. It should not be a surprise that technical, support systems, and prerequisite skills are becoming less and less of a barrier for learners in today's technical environment. These defined barriers focus more on the loss of social acceptance and engagement with co-workers and family as a result of elearning assignments. The results also point to the challenges in the workplace for leaders to focus on development versus operational needs. These are critical understandings for fully understanding and successfully implementing delivery. These results illustrated the needs for effective communications and marketing in program delivery. A key element that could remove some of these barriers might have been involvement of both learners and their supervisors/leaders in the implementation process. This program shared in an opportunity to achieve varied levels of success through appropriate content, motivating learners, and offering a meaningful learning experience (Allen, 2003). The availability of time and commitment to program delivery or follow-up points back to both the values of the organization and the individual in becoming a learning organization. Without full acceptance by the learner and their support system, the best interface and unlimited resources cannot contend for learner motivation and focus.

Learning Interpersonal Communications

Learning interpersonal communications relies on a high cognitive burden (Merrienboer, Jelsma, & Paas, 1992). The most widely accepted learning strategy in instructor-led environments is role-play practice sessions (Van Ments, 1983). From many perspectives, this approach served its purpose but group-based role-play sessions create various challenges for the learning process. These challenges include political, social, cultural, and public presentation anxieties for participants. Although seldom addressed by facilitators in training, it is much easier to progress rapidly to practice and support the learners through coaching and flexibility. Maintaining face in the session and focusing on conversational or conflict management skills and models, assumes a generous portion of cognitive load. This use of cognitive capacity attributes to significant content and learning being lost in the experience (Van Ments).

This research indicated that online or computer-based role-plays offer opportunities for the learner to explore communication choices with less stress and risk. As LET graduates, the interpersonal communications content is very important for this target population. How it is presented and the level of challenge for participants is important for their personal development and for their organizations. The purpose of this module was for learners to continue with schemata acquisition that allowed for effective interaction and problem solving. The effective use of simulated role-plays to accomplish this learning event has been the primary purpose of this research.

In simulations, learning is dependent on character reaction and the user's interface with the learning environment (Aldrich, 2004). Aldrich states that, "simulations are tools that allow users to learn by practicing in a repeatable, focused environment" (p. 243). Powell (2001) notes that, "the best simulations promise to provide something lifelike,

new, and a chance to practice, practice, practice" (p. 36). Online or computer-based simulations allow learners to immerse themselves into the experience allowing the chance to practice, reflect, and implement new approaches based on feedback and learned content. The design of simulations, or scenario-based events, requires working in layers to design the necessary levels of functionality, realism, interactivity, and feedback to motivate learners. A single straightforward simulated path from the beginning of the scene to the end allows a frame of reference for the designer to build from. The designer should obtain acceptance of defined solutions from an expert review panel or focus group of participants. Once this acceptance is defined, the designer should then build in complexity. This involvement offers motivational and subject matter expertise that should not fall on the shoulders of the designer(s). A student's learning from the environment requires allowing the environment to do the teaching (Skinner, 1968). This approach means student involvement in design because of the cultural complexities involved in communication-based interactions. As an example, how one might manage confrontations in a boardroom at IBM might differ from how a teacher in the classroom might approach an issue. Applying asynchronous learning for interpersonal skills has a strong future as developmental barriers are reduced such as costs, expertise required, complexity, and availability. Interviews and observations indicate that the use of simulations and other interactive strategies and technologies could strongly support the tuning and initial learning of these complex social skills.

Enhancing Skill Transfer and Impact

In both One-on-One Reviews and Field Trial implementations, time restrictions and interruptions on the participants challenged efforts for follow-up and training

reinforcement. To achieve this reinforcement of learning, a process should be implemented that ensures effective learning. This research has shown that design should follow a consistent learning model that: 1) establishes learning goals; 2) builds a design blueprint; 3) develops content in layers; 4) involves learners and leaders in the development process; 5) offers opportunities for tuning; 6) performs organizational maintenance for learning; and 7) evaluates performance and changing needs. Maintenance for learning constitutes involvement on the part of the learners and organizational leaders before, during, and following training. It is this commitment that is challenged in training and effective strategies and technologies may be the key to open these doors.

For user ratings to increase, resulting in enhanced motivation to learn, barriers will need to be removed for this form of learning. The observation that some participants in this research saw positive learning opportunities with a more individualized approach to scenario-based learning supported this strategy to reinforce interpersonal skills. A goal would be for organizations to view asynchronous methods, specifically leadership and social skill training, in a more individualized format as cost-effective, timely, and measurable. Then, this technical and instructional approach offers both tuning and post-instructional assessment opportunities that currently are not fulfilled.

Discussion Summary and Future Research

The application of online and computer-based learning strategies for the development of interpersonal skill training is not a new concept. The analysis of research on social skills training offers only scant evidence that it has typically been an effective strategy (Hallahan, Kaufman, & Lloyd, 1999). Defining effective strategies and media to

enhance long-term knowledge and the skill transfer of these skills reflected the overall goals of this research and investigation. The attributes of distance delivery options, engagement capabilities, and centralized tracking of results offer to fill the current gap in Level 3 assessment for skill application and transfer in professional and educational learning environments (Kirkpatrick, 1994).

The potential for future research exists, as the availability of simulated learning becomes more cost-effective, designer-friendly, and platform accessible. The attributes for this technology require definition and validation by the instructional technology field. Some of the attributes that justify further research would be the acceptance of social agents in computer-based environments, the effects of post-instructional review modules in leadership and other content areas, and applying the principles of individualized instruction to group interface and dynamics. The research in this area could align with an entire generation of computer-users familiar with the concepts of virtual reality, computer-based communications, and online group dynamics. Just as programmed instruction and correspondence courses required an academic presence, the effective application of simulated learning for interpersonal communications and other skills lies in the hands of the researchers from instructional technology. In essence, the field of instructional technology has the opportunities to let the learning environment, even if simulated, do the teaching in hopes of enhancing comprehension and skill transfer.

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APPENDIX A

Gordon Training International LET Documents

LET Key Learning Competencies

LET Class-based Performance Objectives

Research Request and Approval Email

L.E.T. Core Competencies

After participation in an L.E.T. course, it is expected that you will have the ability to:

1. Determine who "owns the problem" in a given situation.
2. Identify the 12 Roadblocks to Communication.
3. Distinguish between Roadblocks and Active Listening.
4. Avoid the Roadblocks that cause most helping attempts to fail.
5. Recognize when team members need your help as a skilled listener.
6. Use silence, acknowledgments and door-openers to help another person with a problem.
7. Active Listen to hear another's feelings.
8. Active Listen to clarify information.
9. Distinguish between Acceptable and Unacceptable Behavior.
10. Determine what to do when another's behavior is interfering with your meeting your needs.
11. Develop a three-part Confrontive I-Message.
12. Confront another's unacceptable behavior with an I-Message.
13. Shift gears between I-Messages and Active Listening when appropriate.
14. Acknowledge others' efforts with Appreciate I-Messages.
15. Prevent problems and conflicts using Preventive I-Messages.
16. Recognize conflict situations.
17. Distinguish between Conflicts-of-Needs and Values Collisions.
18. Avoid the use of Method I.
19. Avoid the use of Method II.
20. Set the stage for Method III Conflict Resolution.
21. Use Method III to resolve a conflict you have with another person.
22. Use Method III to mediate a conflict between others.
23. Handle Values Collisions.
24. Use the Principle of Participation when there's an issue or problem involving team members.

Class-based Leader Effectiveness Training Workshop Session Objectives

Session 1:

- To understand the goals of the L.E.T. Workshop.
- To get acquainted with each other.
- To deal with your hopes, fears, and expectations.
- To understand the Behavior Window.
- To identify who owns the problem in a relationship.

Session 2:

- To be able to recognize when others need your help as a skilled listener.
- To be able to avoid the 12 typical responses that cause most "helping" attempts to fail.
- To understand the underlying process of successful verbal communication.
- To become functional in the powerful skill of Active Listening.

Session 3:

- To learn to recognize and avoid the usual and counterproductive ways of confronting others' unacceptable behaviors.
- To understand how anger sometimes covers up more basic feelings.
- To learn how to confront others effectively with I-Messages.
- To learn how to make Confrontive I-Messages work even when they cause upset in the other.
- To learn the natural limits of the Confrontive I-Message.

Session 4:

- To discuss the nature of conflict.
- To understand the price we pay for resolving conflicts either by autocratic or permissive means.
- To learn and be able to use a far more effective method for resolving most conflicts.

Session 5:

- To become aware of the learning stages.
- To understand the special nature of the conflicts called "Values Collisions".
- To learn a variety of effective strategies for influencing, changing or accepting another's differing values.
- To understand and accept that people's values have such a personal and emotional meaning for them that some differences may always remain.

Session 6:

- To learn about and practice different kinds of I-Messages for use in the No Problem Area.
- To learn the use of Active Listening in the No Problem Area.
- To learn the use of the Six Steps in the No Problem Area.

June 23, 2004

Michelle Adams
Director of Client Relations
Gordon Training International
531 Stevens Avenue West
Solana Beach, CA 92075-2093 USA

Dear Michelle:

I am writing as a follow-up to our continued conversation on involving Gordon Training International (GTI), and their Leader Effectiveness Training™ program (LET), in my ongoing academic research. I am "hopefully" entering into my final year as a Ph.D. student and working on developmental research for my dissertation. My degree will be a Ph.D. in education with a focus on instructional technology. The overall scope of my research is a synthesis between the instructional and pedagogical philosophies, practices, and theories for instructional technology and my background in leadership development.

Research Purpose

My research is entitled, *"The Development of an Asynchronous Post-Instructional Module on Interpersonal Communications"*. I am attaching my doctoral committee prospectus proposal and a recent paper I did for the Eastern Educator's Research Conference in Florida describing my research. The goal of this research is to develop a post-instructional learning module template that guides the design, development, and evaluation of computer-based strategies for teaching and reinforcing interpersonal skills. This approach is a first step toward the development of an instructional model for an asynchronous approach to post-instructional reinforcement in multiple disciplines. The

development of an instructional model for maintenance of interpersonal skills training could ensure an effective transfer of learning and return for stakeholder organizations.

Research Process

The process for this research will involve my developing computer-based (online) modules that are self-facilitated to be used by leadership students following professional development in interpersonal communications at varied time frames. The program will be designed and developed using a formative design model, which includes continuous peer/expert review by trainers familiar with the content, prototype implementation for student groups, and ongoing feedback & adjustments to the modules. Because of my involvement as a LET facilitator, and my confidence in all of its trained facilitators and the GTI knowledge base, I view collaborating with GTI as a win-win opportunity. In building computer-based role-play scenarios that could simulate and reinforce concepts such as Active Listening, the Behavior Window, Confrontive I-messages, Method III, and Values Collisions, this could be a tool that GTI might use to support the long-term interest of their clients. From my perspective, I would not have to reinvent the wheel on assessments, 360 performance evaluations, and valid content and I have a strong foundation in the concepts used in LET. GTI would come away with learning tools that they have helped construct and that might support the maintenance of learning as part of your People Productivity Process™.

This summer, I will be developing a more specific schedule and development chart that would highlight how and when I might call upon the LET trainers as an expert review committee. Their role would be to look at performance objectives, storyboards, and both

paper and virtual prototypes. I will be working with text-based, static graphic/photo, video-based, and animated character-based simulation modules. I would also welcome any client programs that might be willing to serve as virtual laboratories that would have their LET attendees go through the modules and complete online feedback surveys.

Stakeholder Relationships

I would ask that GTI evaluate these modules as potential tools that might be made generic enough to be sold to clients following the design/development process, with an evaluative acknowledgement from G.T.I., and some negotiated revenue split for those module sales. I will acknowledge for you that I am making this request as a PhD student at Virginia Tech and in my independent interest, and not as an agent or employee of Radford University Business Assistance Center or as a GTI client. If the final product is not aligned with G.T.I.'s goals, then my research would have been accomplished and your team will have had an opportunity to explore this medium as an additional learning reinforcement tool along with some of your client base.

Just as GTI has legal and proprietary ownership of the concepts in LET, I would need to establish my control and proprietary ownership of publication of the research findings and the research process. All findings would be shared with GTI and opportunities for professional exposure would exist from my conference presentations and academic journal submittals. All research processes adhere to strict university level research guidelines and IRB approvals to ensure ethical and professional practices.

Response

Based on this information, I would request that you consult with Linda Adams and the G.T.I. team, and to acknowledge your level of interest by mid-July if possible to support my contingency planning. Thanks for the opportunity to forward this request, the opportunity to continue to learn from LET, and the outstanding customer service that you and your team always provide me.

Sincerely,

Randy Hollandsworth

Attachments

-----Original Message-----
From: Michelle Adams [mailto:MichelleAdams@GordonTraining.Com]
Sent: Wednesday, October 27, 2004 11:06 AM
To: Hollandsworth Randall J.
Subject: RE: Request for expert review panelist for LET online module research

Hi Randy:

Congratulations! I know you pretty much knew you would receive approval, but still, now it's official. ☺

I will send prospective volunteers the revised volunteer info and then have them contact you directly if they are interested.

Do you want me to hand pick or send a bulk email to all LET trainers?

From: Hollandsworth Randall J. [mailto:rhollands@RADFORD.EDU]
Sent: Tuesday, October 26, 2004 12:19 PM
To: Michelle Adams
Subject: Request for expert review panelist for LET online module research

Hi Michelle,

I got the formal word yesterday and passed my Prospectus Exam. This means that development on the module is ready to begin. I am attaching a revised information sheet for the potential volunteer facilitators based on one change that occurred in the exam regarding sample numbers for the field trials. I will be using the same sample of 20 participants for both field trials vs two separate groups. I have a link both on the form and below that will begin the process of obtaining assistance from these volunteers:

http://filebox.vt.edu/users/rholland/DRW1.htm

Once you have the 5-7 expert review panel members identified, let me have their email addresses and I will forward clear step by step instructions. The website above also provides them access to the opening page, a link to the IRB Implied Consent Waiver form (required by University IRB policy), and information on the research. I will be following up with specific requests on feedback on the objectives, storyboards, and simulation solutions. PLEASE ENSURE THAT THEY RECEIVE THE ATTACHED REVISION ON THE EMAIL REQUEST FOR VOLUNTEERS INFORMATION.

I look forward to working with this team on this effort and obtaining GTI's feedback. As a facilitator, I believe a review module would add a great resource for the LET program that few of the competition are attempting to do.

Thanks for your support and trust in my abilities,

Randy

Randy Hollandsworth

APPENDIX B

Instructional Design Documents

Learning Outcome Results

CBT Learning Goal Worksheets

Simulation Solution Flow Charts

DESIGN WORKSHEET: The Development of an Asynchronous Post-Instructional Module on Interpersonal Communications

Program: Gordon Training International Leader Effectiveness Training	**Date:** October 25, 2004	**Designer(s):** Randy Hollandsworth

LEARNING GOAL

To review and apply the conceptual Behavior Window model in interpersonal skill application and comprehension.

MEASUREMENT
Acceptance…….. __X_
Comprehension…… ____
Application…….. ____
Impact……..…… ____

Performance (tasks to perform goal)	**Condition** (learning environment)	**Learning Outcomes***					**Criterion** (restrictions, tools)
		Intellectual Skills	***Cognitive Strategies***	***Verbal Information***	***Psycho-motor***	***Attitudinal***	
1. Determine who "owns the problem" in a given situation.	Interactive computer-based learning module	X (Conceptual Definition)	X (Behavior Window)			X	Behavior Window Model shown. Textual scenario-based recognition exercises.
9. Distinguish between Acceptable and Unacceptable Behavior.	Interactive computer-based learning module	X (Discrimination)	X (Behavior Window)	X			Behavior Window Model shown. Texual Scenario-based recognition exercises.

- Learning outcomes and performance objectives structure derived from (Gagn*e, Briggs, & Wager, 1988).
- Numbered performance tasks reference Gordon Training International's 24 key learning concepts in LET.

DESIGN WORKSHEET: The Development of an Asynchronous Post-Instructional Module on Interpersonal Communications

Program: Gordon Training International Leader Effectiveness Training	**Date:** October 25, 2004	**Designer(s):** Randy Hollandsworth

LEARNING GOAL

To review and apply Active Listening techniques for interpersonal skill applications.

MEASUREMENT
Acceptance…….. _X__
Comprehension…… ____
Application…….. ____
Impact……..…… ____

Performance (tasks to perform goal)	**Condition** (learning environment)	**Learning Outcomes***					**Criterion** (restrictions, tools)
		Intellectual Skills	***Cognitive Strategies***	***Verbal Information***	***Psycho-motor***	***Attitudinal***	
3. Distinguish between Roadblocks and Active Listening.	Interactive computer-based learning module	X (Discrimination)		X (Roadblock List)			Review of list, matching exercise with list available.
4. Avoid the Roadblocks that cause most helping attempts to fail.	Interactive computer-based role-play	X (Rule Application)		X (Roadblock List)	X	X	Practice scenario with list available.
5. Recognize when team members need your help as a skilled listener.	Interactive computer-based role-play	X (Problem-solving)	X (Behavior Window)		X	X	Roadblock list and model terms accessible by learner.

- Learning outcomes and performance objectives structure derived from (Gagn*e et al., 1988).
- Numbered performance tasks reference Gordon Training International's 24 key learning concepts in LET.

DESIGN WORKSHEET: The Development of an Asynchronous Post-Instructional Module on Interpersonal Communications

Program: Gordon Training International Leader Effectiveness Training	**Date:** October 25, 2004	**Designer(s):** Randy Hollandsworth

LEARNING GOAL

To review and apply Active Listening techniques for interpersonal skill applications.

MEASUREMENT
Acceptance…….. __X_
Comprehension…… ____
Application…….…… ____
Impact……..…… ____

Performance (tasks to perform goal)	**Condition** (learning environment)	**Learning Outcomes***					**Criterion** (restrictions, tools)
		Intellectual Skills	***Cognitive Strategies***	***Verbal Information***	***Psycho-motor***	***Attitudinal***	
1. Determine who "owns the problem"	Interactive computer-based role-play	X (Rule Application)	X (Behavior Window)			X	Scenario with no roadblock list, visual of model with no reference.
9. Distinguish between Types of Behaviors.	Same as above	X (Discrimination)	X (Behavior Window)				Same as above.
7. Active Listen to hear another's feelings.	Same as above	X (Problem-solving)			X	X	Same as above.
8. Active Listen to clarify information.	Same as above	X			X	X	Same as above.

- Learning outcomes and performance objectives structure derived from (Gagn*e et al., 1988)
- Numbered performance tasks reference Gordon Training International's 24 key learning concepts in LET.

DESIGN WORKSHEET: The Development of an Asynchronous Post-Instructional Module on Interpersonal Communications

Program: Gordon Training International Leader Effectiveness Training	**Date:** October 25, 2004	**Designer(s):** Randy Hollandsworth

LEARNING GOAL

To review and apply Confrontive I-Message techniques for effective conflict management applications.

MEASUREMENT
Acceptance…….. __X_
Comprehension…… ____
Application…….…… ____
Impact……..…… ____

Performance (tasks to perform goal)	**Condition** (learning environment)	**Learning Outcomes***					**Criterion** (restrictions, tools)
		Intellectual Skills	***Cognitive Strategies***	***Verbal Information***	***Psycho-motor***	***Attitudinal***	
11. Review of a three-part Confrontive I-Message.	Interactive computer-based learning module	X (Conceptual Formation)		X (3 Parts Confrontive-I Message)			Review of parts of Confrontive-I, matching exercise with text shown.
12. Construct a Confrontive I-Message.	Interactive computer-based learning module	X (Rule Application)		X			Textual exercises with Confrontive I-Message accessible.

- Learning outcomes and performance objectives structure derived from (Gagn*e et al., 1988).
- Numbered performance tasks reference Gordon Training International's 24 key learning concepts in LET.

DESIGN WORKSHEET: The Development of an Asynchronous Post-Instructional Module on Interpersonal Communications

Program: Gordon Training International Leader Effectiveness Training	**Date:** October 25, 2004	**Designer(s):** Randy Hollandsworth

LEARNING GOAL

To review and apply Confrontive I-Message techniques for effective conflict management applications.

MEASUREMENT
Acceptance…….. __X_
Comprehension…… ____
Application……..…. ____
Impact……..…… ____

Learning Outcomes*

Performance (tasks to perform goal)	**Condition** (learning environment)	*Intellectual Skills*	*Cognitive Strategies*	*Verbal Information*	*Psycho-motor*	*Attitudinal*	**Criterion** (restrictions, tools)
1. Determine who "owns the problem"	Computer-based role-play	X (Rule Application)				X	Exercises with tools accessible but not shown.
9. Distinguish between Types of Behaviors.	Same as above	X (Rule Application)	X (Behavior Window)				Exercises with tools accessible.
11. Develop a three-part Confrontive I-Message.	Same as above	X (Rule Application)	X (Confrontive-I Message)	X (Confrontive-I Message)			Exercises with tools accessible.
12. Confront unacceptable behavior with an I-Message.	Same as above	X (Problem-solving)				X	Exercises with tools accessible.

- Learning outcomes and performance objectives structure derived from (Gagn*e et al., 1988).

DESIGN WORKSHEET: The Development of an Asynchronous Post-Instructional Module on Interpersonal Communications

Program: Gordon Training International Leader Effectiveness Training	**Date:** October 25, 2004	**Designer(s):** Randy Hollandsworth

LEARNING GOAL

To synthesize the L.E.T. skills and concepts [Behavior Window, Active Listening, and Confrontive-I Messages] for effective relationship maintenance, conflict management, and problem solving for use in typical professional and personal events.

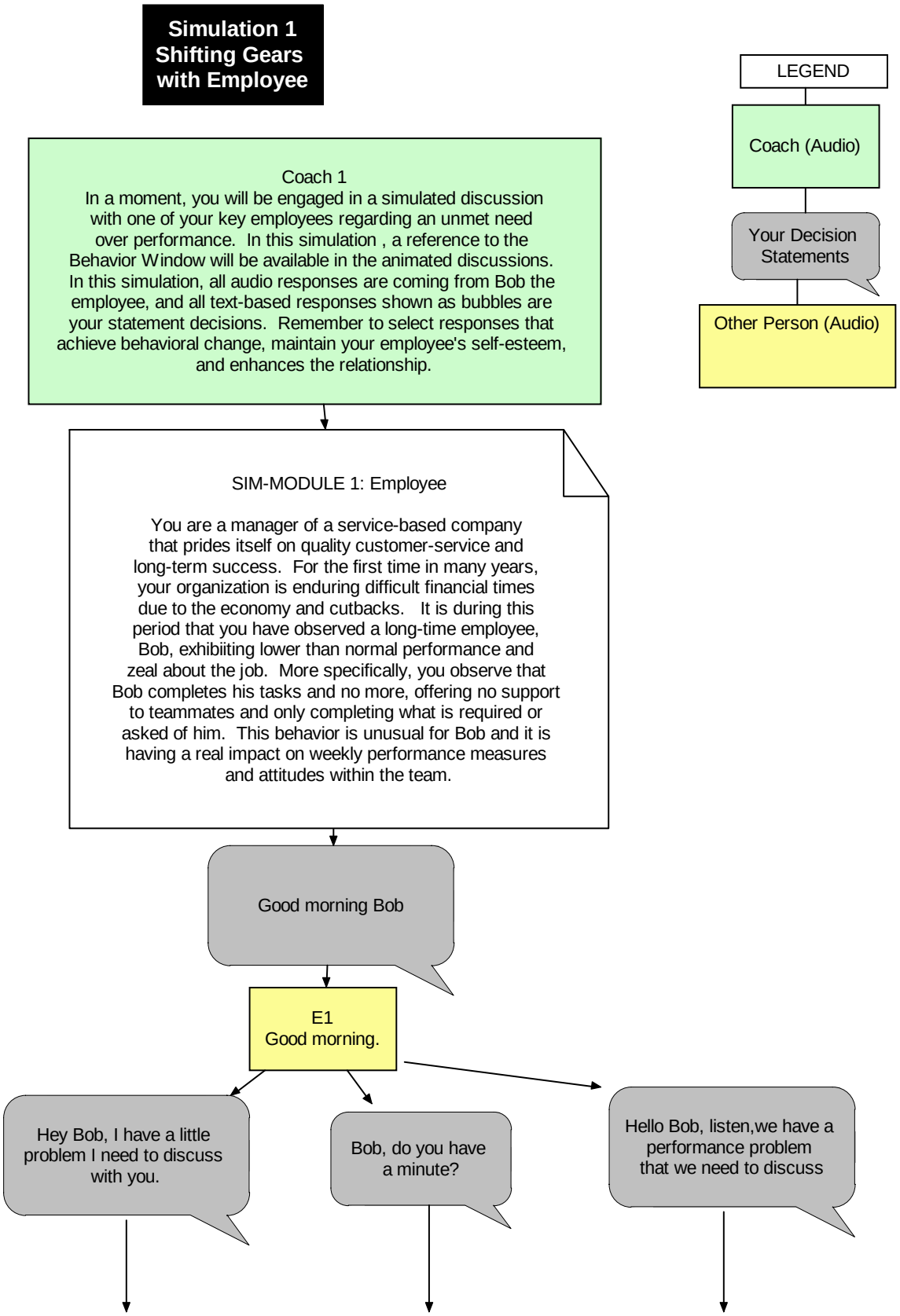
MEASUREMENT
Acceptance…….. __X_
Comprehension…… _X_
Application……..…. ____
Impact……..…… ____

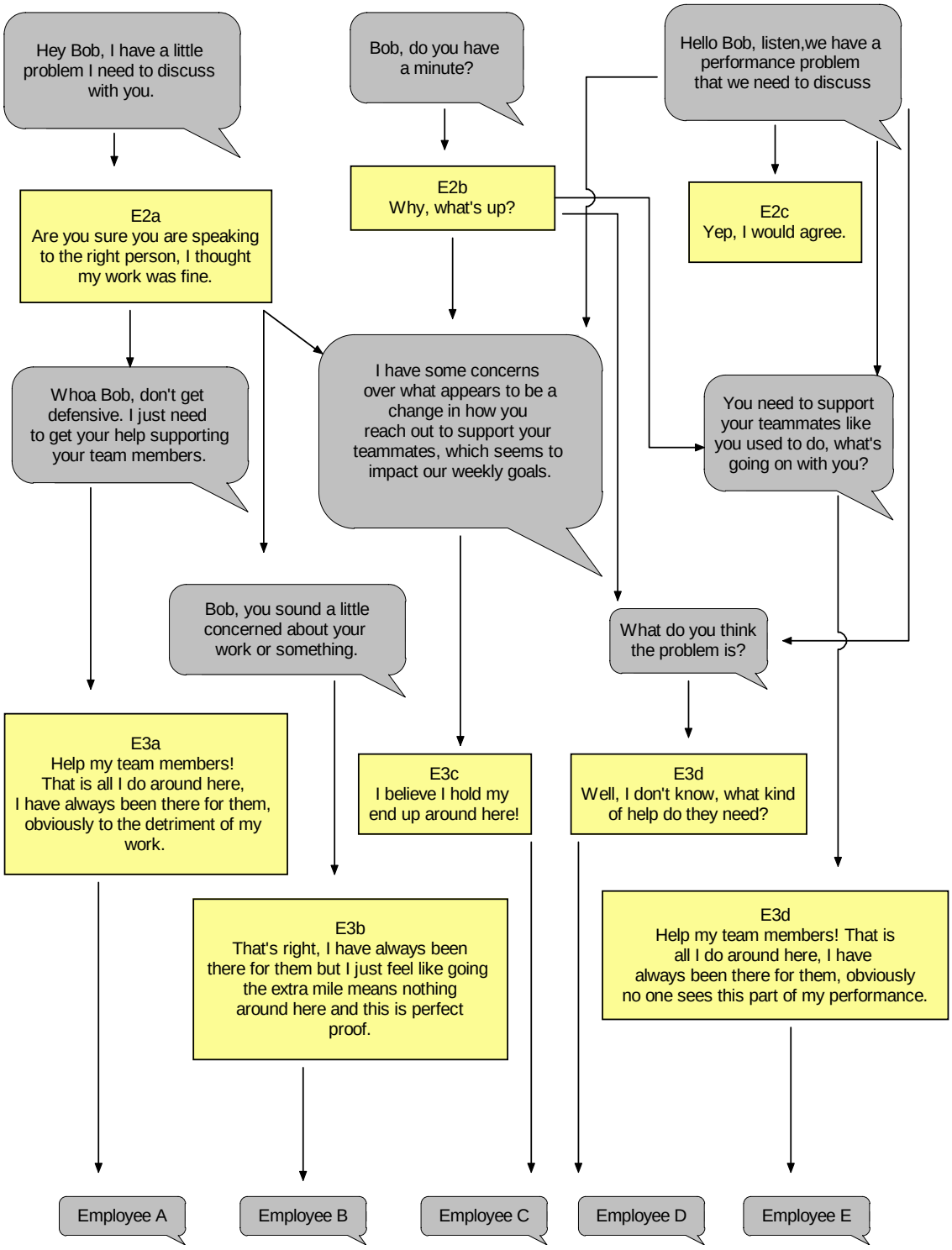
Learning Outcomes*

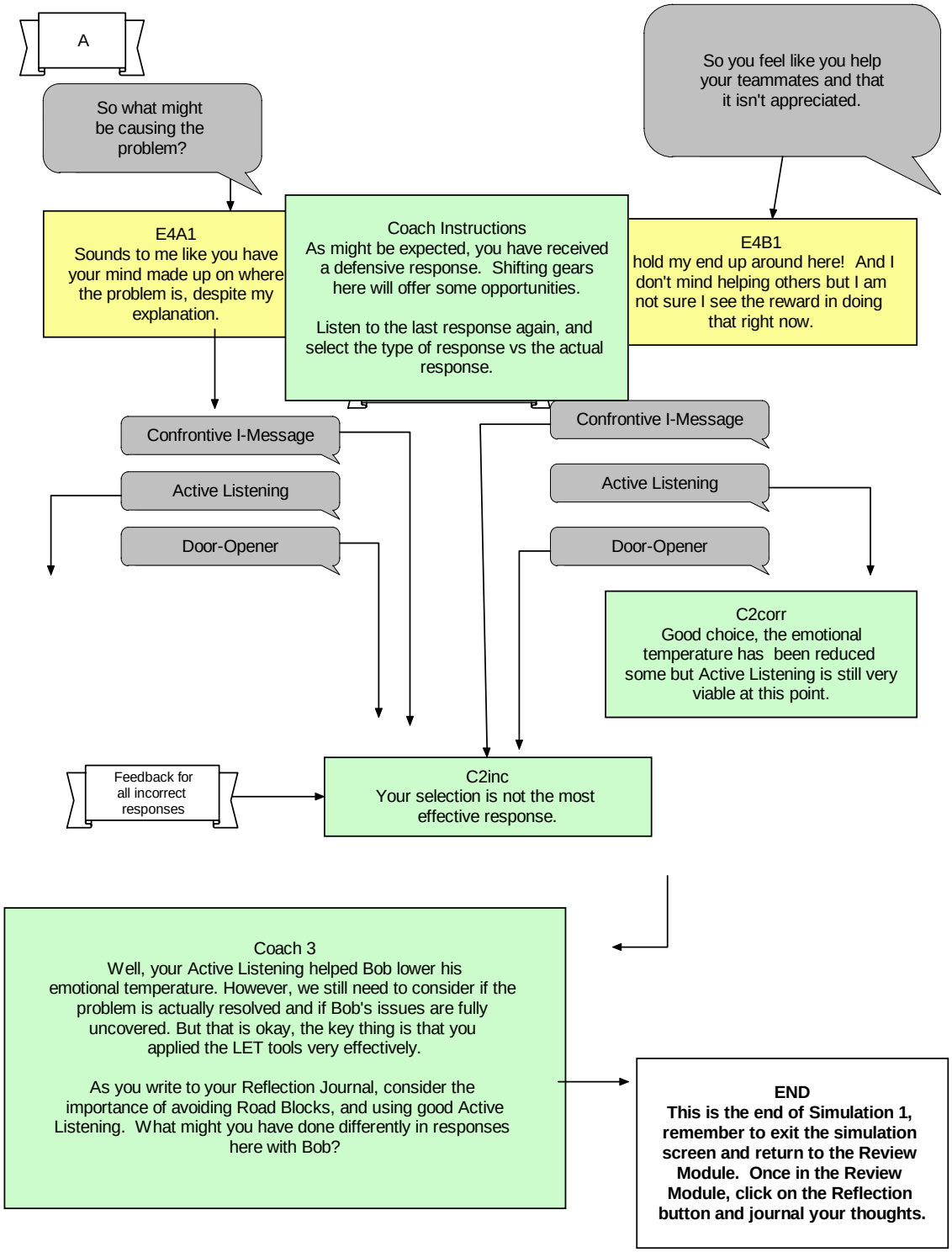
Performance (tasks to perform goal)	**Condition** (learning environment)	*Intellectual Skills*	*Cognitive Strategies*	*Verbal Information*	*Psycho-motor*	*Attitudinal*	**Criterion** (restrictions, tools)
13. Shift gears between I-Messages and Active Listening when appropriate.	Three scenario-based practice sessions	X (Problem-solving)	X (Behavior Window)	X (Confrontive-I Message) X (Roadblock List)		X	Exercises with no tools accessible, reflection, feedback, and elaboration provided with replay functionality.

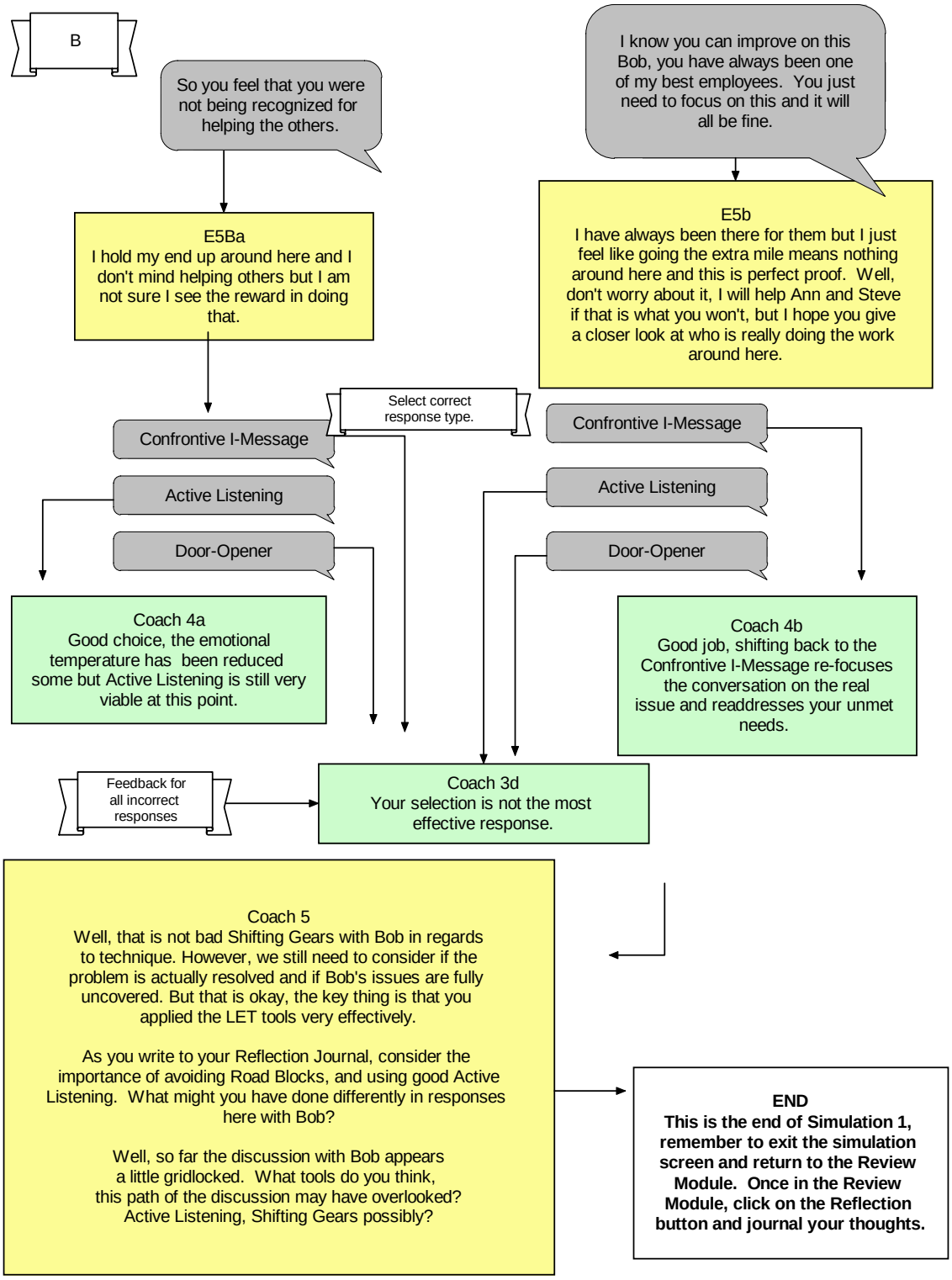
- Learning outcomes and performance objectives structure derived from (Gagn*e et al., 1988).
- Numbered performance tasks reference Gordon Training International's 24 key learning concepts in LET.

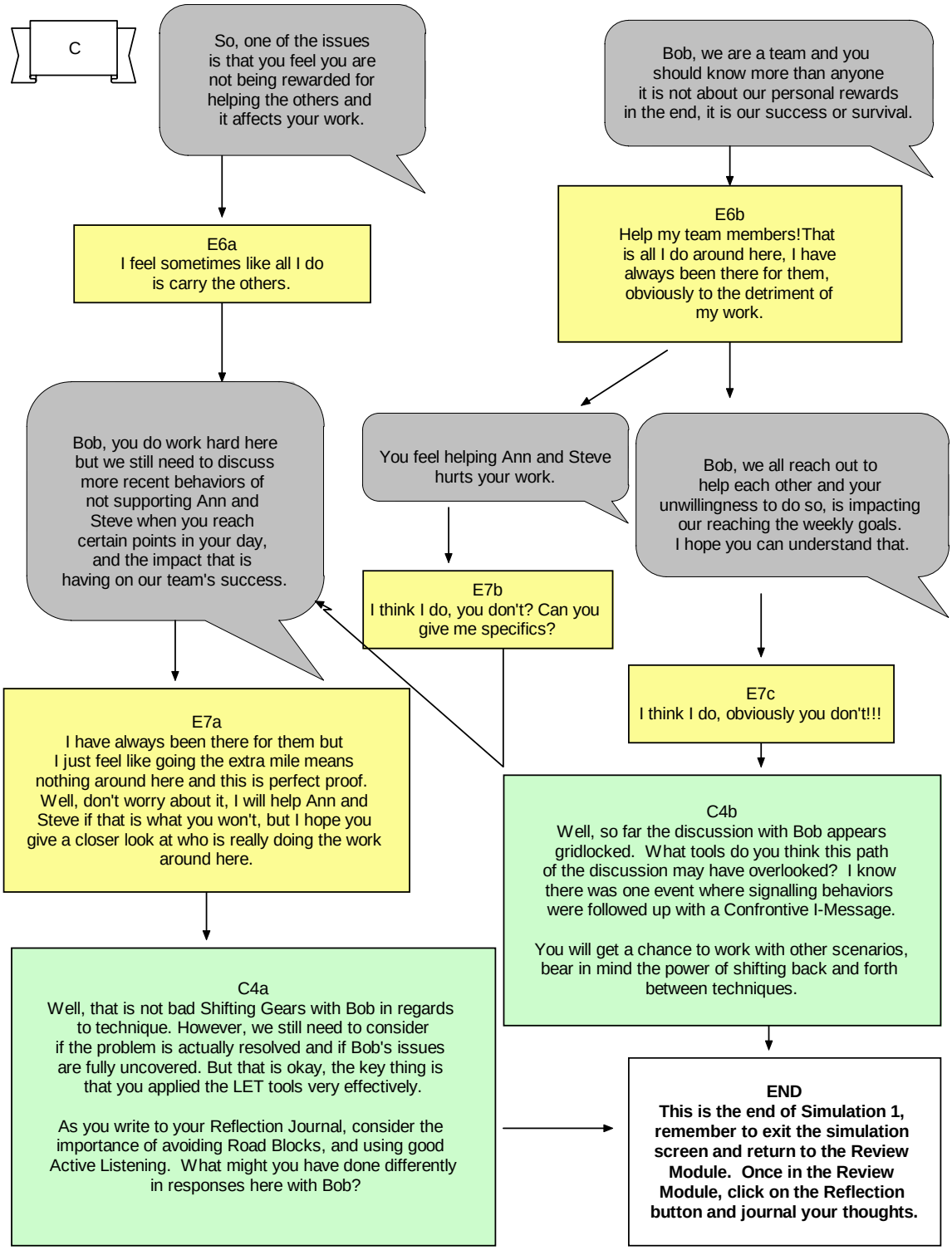
Gagn*e, R. M., Briggs, L. J., & Wager, W. W. (1988). *Principles of instructional design* (3rd ed.). New York: Holt Rinehart and Winston.

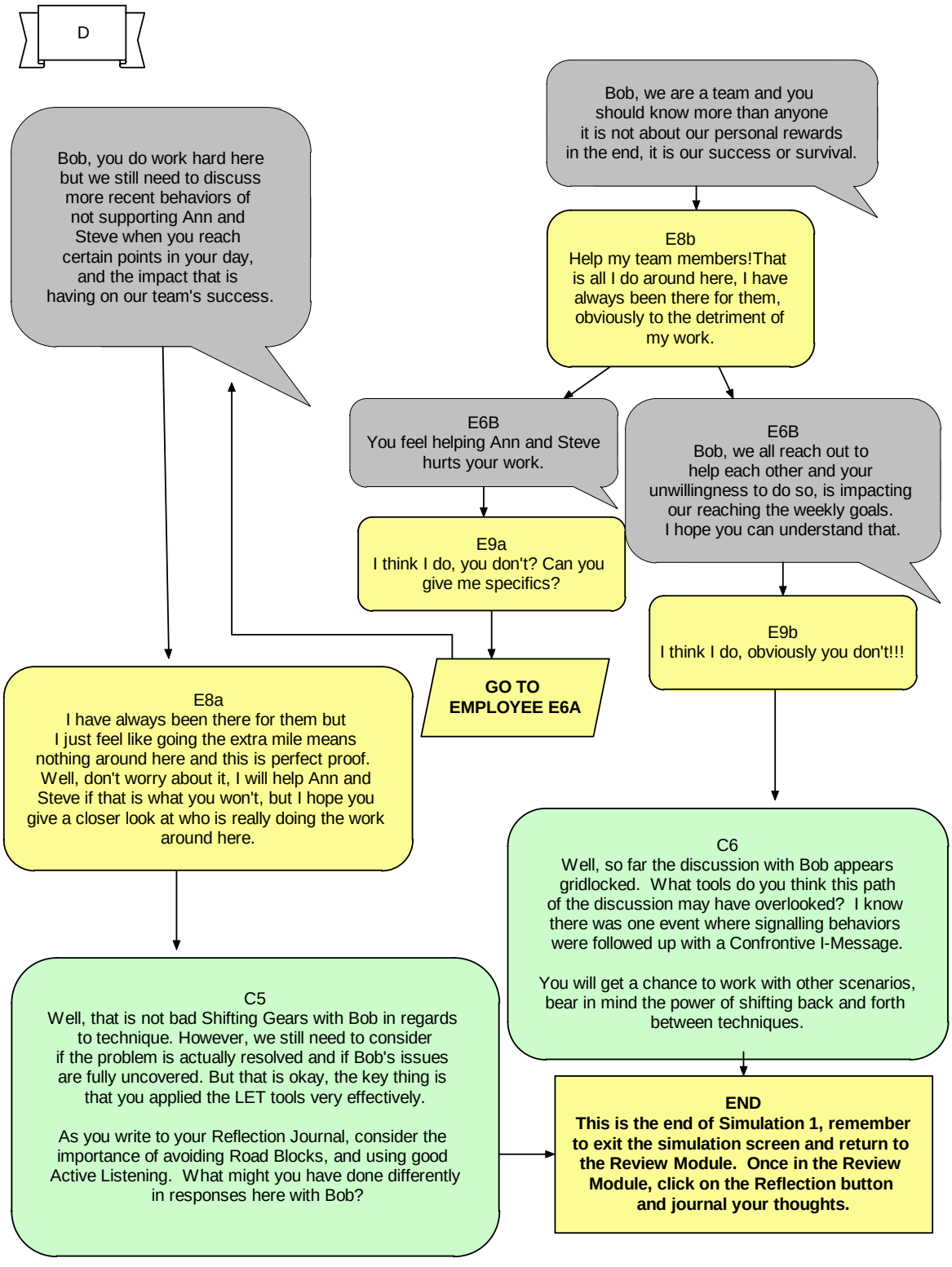

Simulation 1
Shifting Gears
with Employee
LEGEND
Coach (Audio)
Your Decision Statements
Other Person (Audio)
Coach 1
In a moment, you will be engaged in a simulated discussion with one of your key employees regarding an unmet need over performance. In this simulation , a reference to the Behavior Window will be available in the animated discussions. In this simulation, all audio responses are coming from Bob the employee, and all text-based responses shown as bubbles are your statement decisions. Remember to select responses that achieve behavioral change, maintain your employee's self-esteem, and enhances the relationship.
SIM-MODULE 1: Employee
You are a manager of a service-based company that prides itself on quality customer-service and long-term success. For the first time in many years, your organization is enduring difficult financial times due to the economy and cutbacks. It is during this period that you have observed a long-time employee, Bob, exhibiting lower than normal performance and zeal about the job. More specifically, you observe that Bob completes his tasks and no more, offering no support to teammates and only completing what is required or asked of him. This behavior is unusual for Bob and it is having a real impact on weekly performance measures and attitudes within the team.
Good morning Bob
E1
Good morning.
Hey Bob, I have a little problem I need to discuss with you.
Bob, do you have a minute?
Hello Bob, listen,we have a performance problem that we need to discuss

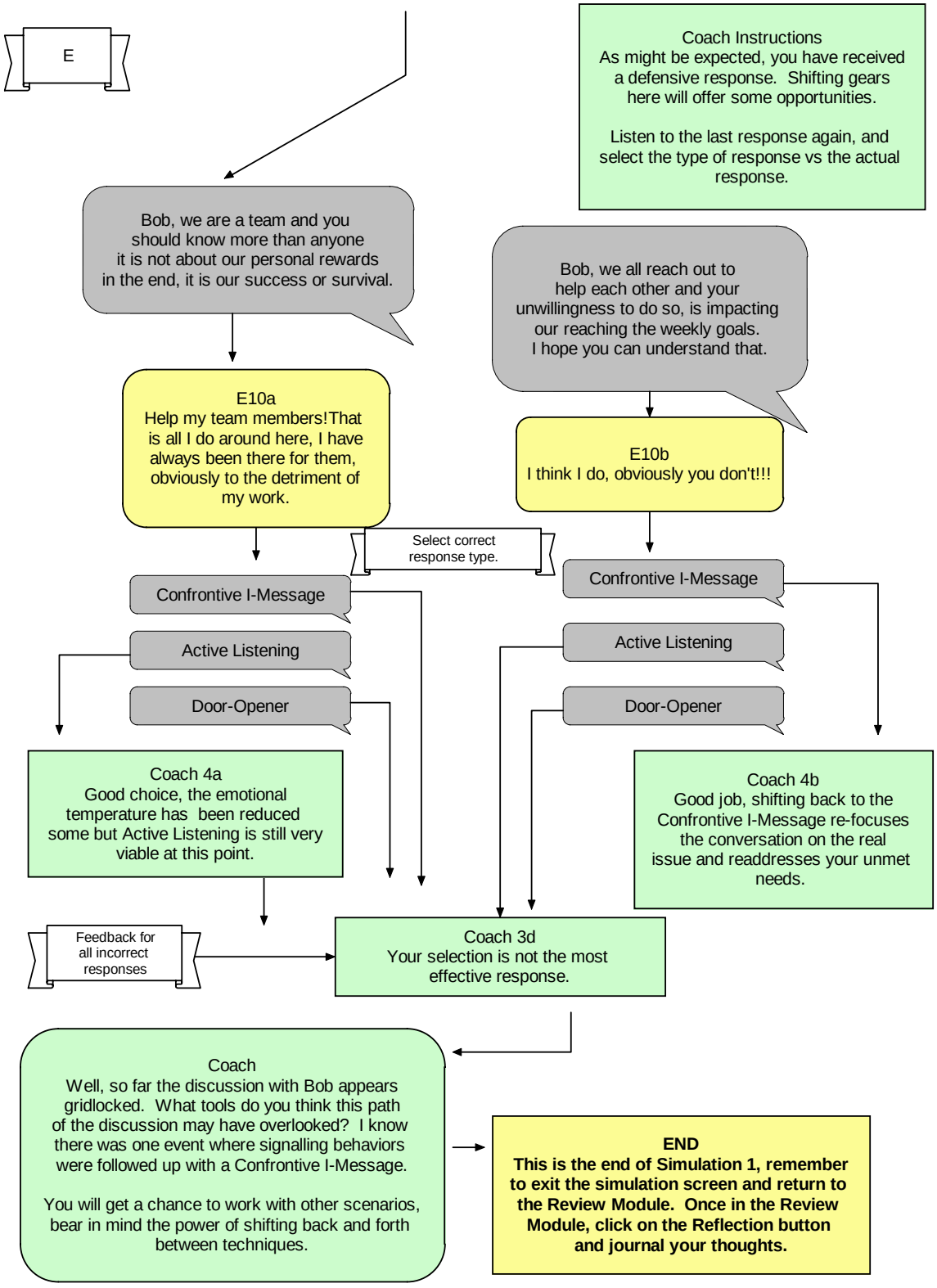

Hey Bob, I have a little problem I need to discuss with you.
Bob, do you have a minute?
Hello Bob, listen,we have a performance problem that we need to discuss
E2a
Are you sure you are speaking to the right person, I thought my work was fine.
E2b
Why, what's up?
E2c
Yep, I would agree.
Whoa Bob, don't get defensive. I just need to get your help supporting your team members.
I have some concerns over what appears to be a change in how you reach out to support your teammates, which seems to impact our weekly goals.
You need to support your teammates like you used to do, what's going on with you?
Bob, you sound a little concerned about your work or something.
What do you think the problem is?
E3a
Help my team members! That is all I do around here, I have always been there for them, obviously to the detriment of my work.
E3c
I believe I hold my end up around here!
E3d
Well, I don't know, what kind of help do they need?
E3b
That's right, I have always been there for them but I just feel like going the extra mile means nothing around here and this is perfect proof.
E3d
Help my team members! That is all I do around here, I have always been there for them, obviously no one sees this part of my performance.
Employee A
Employee B
Employee C
Employee D
Employee E


A
So what might be causing the problem?
So you feel like you help your teammates and that it isn't appreciated.
E4A1
Sounds to me like you have your mind made up on where the problem is, despite my explanation.
Coach Instructions
As might be expected, you have received a defensive response. Shifting gears here will offer some opportunities.
Listen to the last response again, and select the type of response vs the actual response.
E4B1
hold my end up around here! And I don't mind helping others but I am not sure I see the reward in doing that right now.
Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
C2corr
Good choice, the emotional temperature has been reduced some but Active Listening is still very viable at this point.
Feedback for all incorrect responses
C2inc
Your selection is not the most effective response.
Coach 3
Well, your Active Listening helped Bob lower his emotional temperature. However, we still need to consider if the problem is actually resolved and if Bob's issues are fully uncovered. But that is okay, the key thing is that you applied the LET tools very effectively.
As you write to your Reflection Journal, consider the importance of avoiding Road Blocks, and using good Active Listening. What might you have done differently in responses here with Bob?
END
This is the end of Simulation 1, remember to exit the simulation screen and return to the Review Module. Once in the Review Module, click on the Reflection button and journal your thoughts.

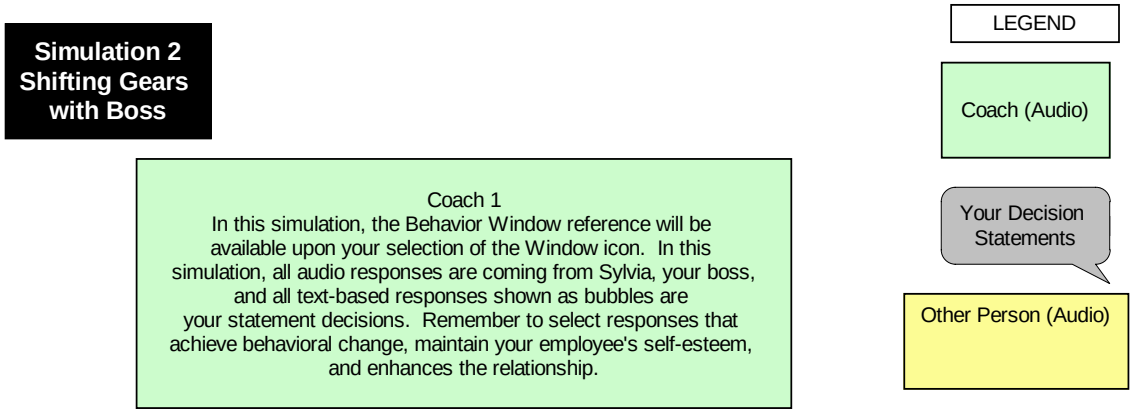

B
So you feel that you were not being recognized for helping the others.
I know you can improve on this Bob, you have always been one of my best employees. You just need to focus on this and it will all be fine.
E5Ba
I hold my end up around here and I don't mind helping others but I am not sure I see the reward in doing that.
E5b
I have always been there for them but I just feel like going the extra mile means nothing around here and this is perfect proof. Well, don't worry about it, I will help Ann and Steve if that is what you won't, but I hope you give a closer look at who is really doing the work around here.
Select correct response type.
Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
Coach 4a
Good choice, the emotional temperature has been reduced some but Active Listening is still very viable at this point.
Coach 4b
Good job, shifting back to the Confrontive I-Message re-focuses the conversation on the real issue and readdresses your unmet needs.
Feedback for all incorrect responses
Coach 3d
Your selection is not the most effective response.
Coach 5
Well, that is not bad Shifting Gears with Bob in regards to technique. However, we still need to consider if the problem is actually resolved and if Bob's issues are fully uncovered. But that is okay, the key thing is that you applied the LET tools very effectively.
As you write to your Reflection Journal, consider the importance of avoiding Road Blocks, and using good Active Listening. What might you have done differently in responses here with Bob?
Well, so far the discussion with Bob appears a little gridlocked. What tools do you think, this path of the discussion may have overlooked? Active Listening, Shifting Gears possibly?
END
This is the end of Simulation 1, remember to exit the simulation screen and return to the Review Module. Once in the Review Module, click on the Reflection button and journal your thoughts.


C
So, one of the issues is that you feel you are not being rewarded for helping the others and it affects your work.
Bob, we are a team and you should know more than anyone it is not about our personal rewards in the end, it is our success or survival.
E6a
I feel sometimes like all I do is carry the others.
E6b
Help my team members!That is all I do around here, I have always been there for them, obviously to the detriment of my work.
Bob, you do work hard here but we still need to discuss more recent behaviors of not supporting Ann and Steve when you reach certain points in your day, and the impact that is having on our team's success.
You feel helping Ann and Steve hurts your work.
Bob, we all reach out to help each other and your unwillingness to do so, is impacting our reaching the weekly goals. I hope you can understand that.
E7b
I think I do, you don't? Can you give me specifics?
E7c
I think I do, obviously you don't!!!
E7a
I have always been there for them but I just feel like going the extra mile means nothing around here and this is perfect proof. Well, don't worry about it, I will help Ann and Steve if that is what you won't, but I hope you give a closer look at who is really doing the work around here.
C4b
Well, so far the discussion with Bob appears gridlocked. What tools do you think this path of the discussion may have overlooked? I know there was one event where signalling behaviors were followed up with a Confrontive I-Message.
You will get a chance to work with other scenarios, bear in mind the power of shifting back and forth between techniques.
C4a
Well, that is not bad Shifting Gears with Bob in regards to technique. However, we still need to consider if the problem is actually resolved and if Bob's issues are fully uncovered. But that is okay, the key thing is that you applied the LET tools very effectively.
As you write to your Reflection Journal, consider the importance of avoiding Road Blocks, and using good Active Listening. What might you have done differently in responses here with Bob?
END
This is the end of Simulation 1, remember to exit the simulation screen and return to the Review Module. Once in the Review Module, click on the Reflection button and journal your thoughts.


D
Bob, we are a team and you should know more than anyone it is not about our personal rewards in the end, it is our success or survival.
Bob, you do work hard here but we still need to discuss more recent behaviors of not supporting Ann and Steve when you reach certain points in your day, and the impact that is having on our team's success.
E8b
Help my team members!That is all I do around here, I have always been there for them, obviously to the detriment of my work.
E6B
You feel helping Ann and Steve hurts your work.
E6B
Bob, we all reach out to help each other and your unwillingness to do so, is impacting our reaching the weekly goals. I hope you can understand that.
E9a
I think I do, you don't? Can you give me specifics?
E9b
I think I do, obviously you don't!!!
GO TO EMPLOYEE E6A
E8a
I have always been there for them but I just feel like going the extra mile means nothing around here and this is perfect proof. Well, don't worry about it, I will help Ann and Steve if that is what you won't, but I hope you give a closer look at who is really doing the work around here.
C6
Well, so far the discussion with Bob appears gridlocked. What tools do you think this path of the discussion may have overlooked? I know there was one event where signalling behaviors were followed up with a Confrontive I-Message.
You will get a chance to work with other scenarios, bear in mind the power of shifting back and forth between techniques.
C5
Well, that is not bad Shifting Gears with Bob in regards to technique. However, we still need to consider if the problem is actually resolved and if Bob's issues are fully uncovered. But that is okay, the key thing is that you applied the LET tools very effectively.
As you write to your Reflection Journal, consider the importance of avoiding Road Blocks, and using good Active Listening. What might you have done differently in responses here with Bob?
END
This is the end of Simulation 1, remember to exit the simulation screen and return to the Review Module. Once in the Review Module, click on the Reflection button and journal your thoughts.


E
Coach Instructions
As might be expected, you have received a defensive response. Shifting gears here will offer some opportunities.
Listen to the last response again, and select the type of response vs the actual response.
Bob, we are a team and you should know more than anyone it is not about our personal rewards in the end, it is our success or survival.
Bob, we all reach out to help each other and your unwillingness to do so, is impacting our reaching the weekly goals. I hope you can understand that.
E10a
Help my team members!That is all I do around here, I have always been there for them, obviously to the detriment of my work.
E10b
I think I do, obviously you don't!!!
Select correct response type.
Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
Coach 4a
Good choice, the emotional temperature has been reduced some but Active Listening is still very viable at this point.
Coach 4b
Good job, shifting back to the Confrontive I-Message re-focuses the conversation on the real issue and readdresses your unmet needs.
Feedback for all incorrect responses
Coach 3d
Your selection is not the most effective response.
Coach
Well, so far the discussion with Bob appears gridlocked. What tools do you think this path of the discussion may have overlooked? I know there was one event where signalling behaviors were followed up with a Confrontive I-Message.
You will get a chance to work with other scenarios, bear in mind the power of shifting back and forth between techniques.
END
This is the end of Simulation 1, remember to exit the simulation screen and return to the Review Module. Once in the Review Module, click on the Reflection button and journal your thoughts.

Simulation 2
Shifting Gears with Boss

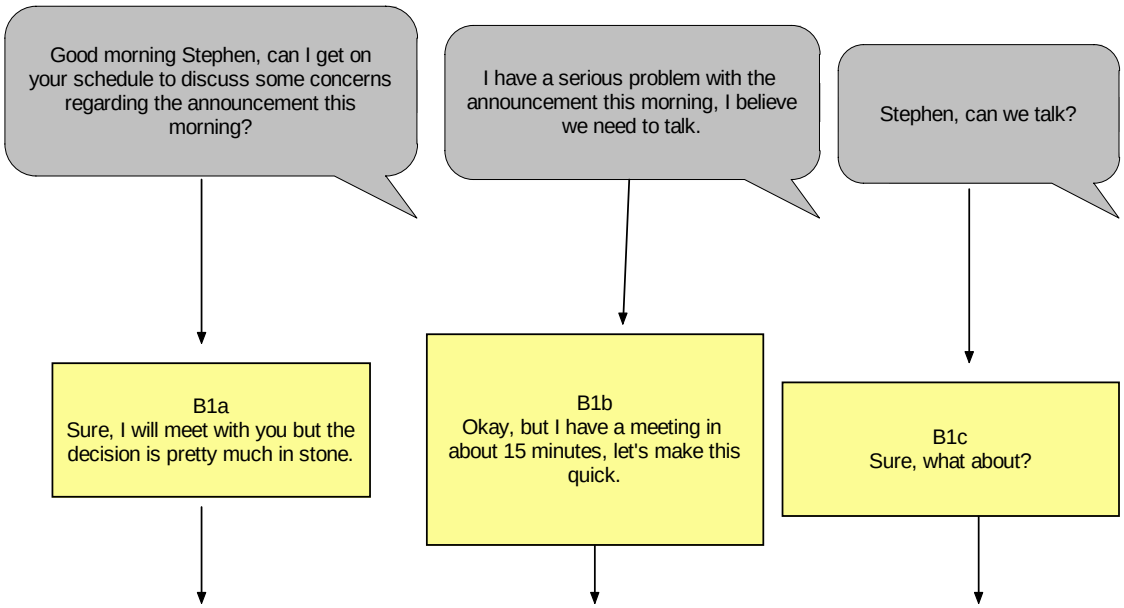


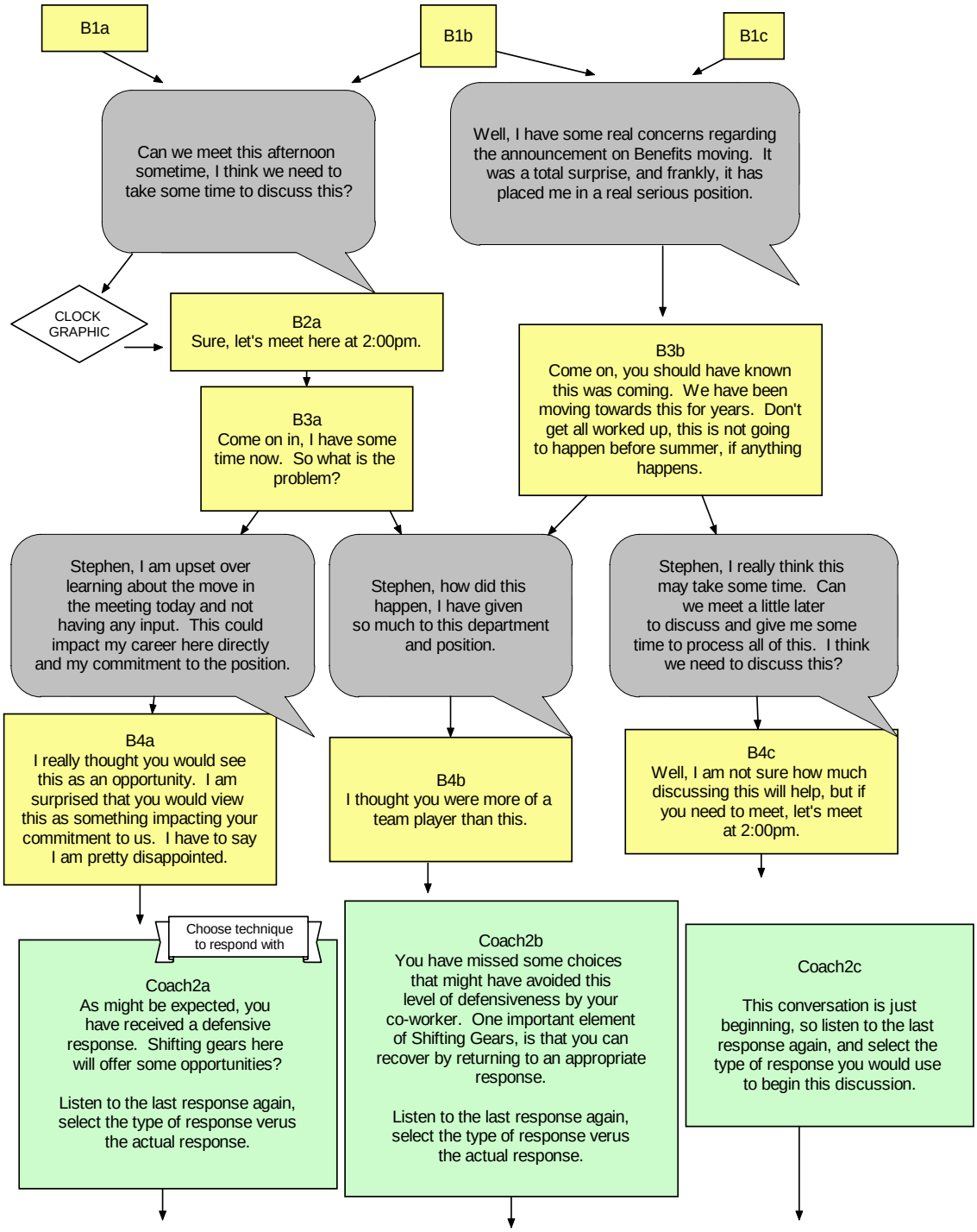
SIM-MODULE 2: Your Boss

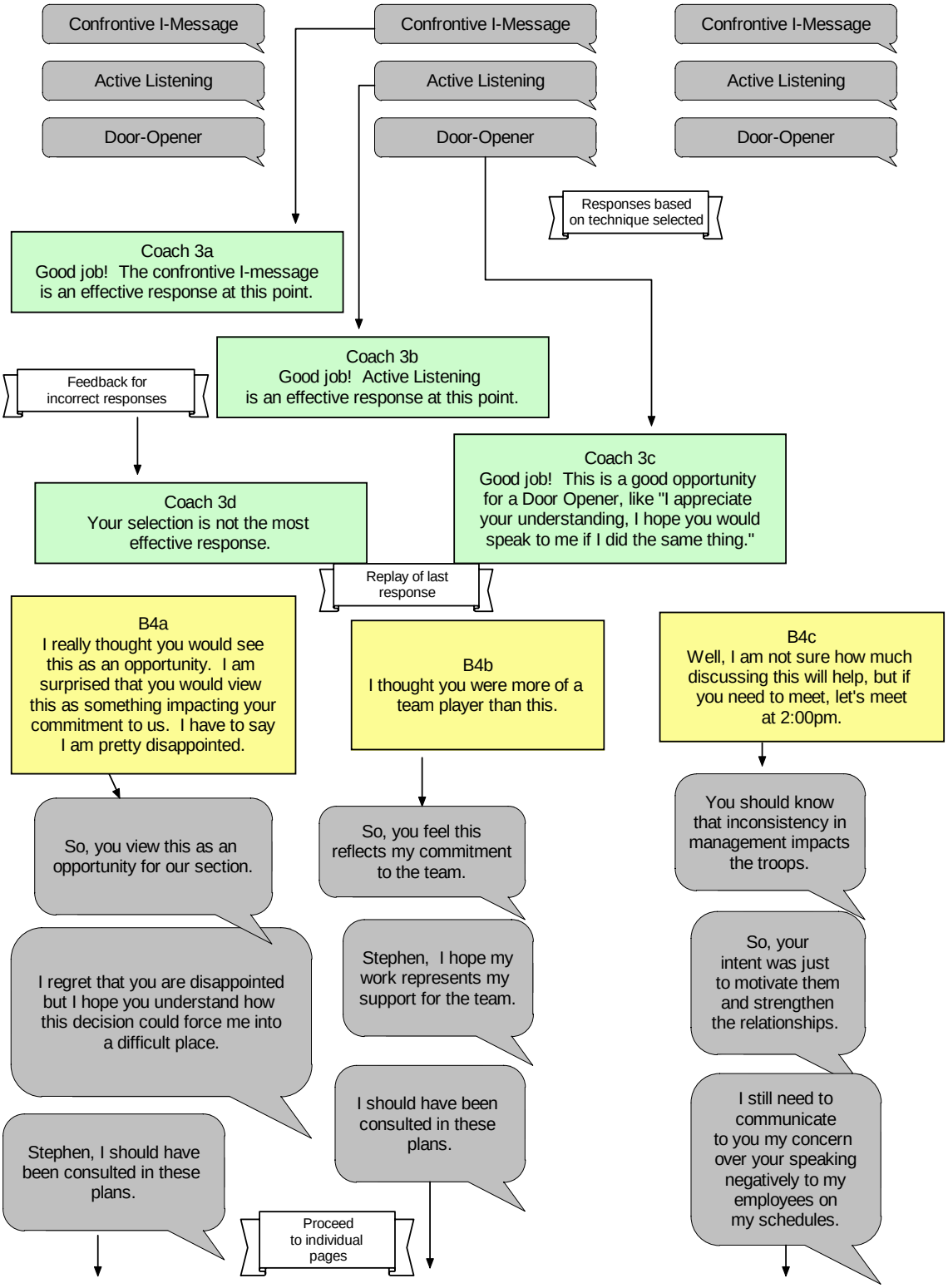
You are a Human Resources Manager within a regional insurance company serving 10 states and part of a HR team of about 15 HR professionals reporting to a single Vice President of HR. Under that VP are five directors that manage various HR functions, of which you are a manager for the benefits section. After 3 moves to different states, your career and family have now reached a point that moving is essentially not an option for you.

Your Director announces in a regional HR meeting consisting of all the management team that he is considering moving the Benefits section to another location, closer to the location employing the most people. This news is the first you have heard of this and in an effort to maintain your commitment to the organization, the issue must be addressed.

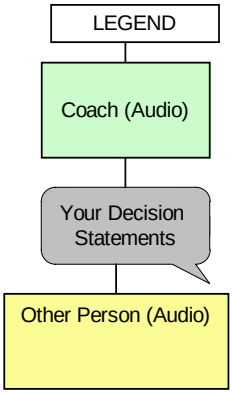
The issue is pretty clear and could result in the need for a Method III approach, but you know that you must confront your Boss on the plans and the method that it was introduced. In your past interactions, you have found your Boss a fair person, but difficult to move from a position on anything of this nature. Good luck.




B1a
B1b
B1c
Can we meet this afternoon sometime, I think we need to take some time to discuss this?
Well, I have some real concerns regarding the announcement on Benefits moving. It was a total surprise, and frankly, it has placed me in a real serious position.
CLOCK GRAPHIC
B2a
Sure, let's meet here at 2:00pm.
B3a
Come on in, I have some time now. So what is the problem?
B3b
Come on, you should have known this was coming. We have been moving towards this for years. Don't get all worked up, this is not going to happen before summer, if anything happens.
Stephen, I am upset over learning about the move in the meeting today and not having any input. This could impact my career here directly and my commitment to the position.
Stephen, how did this happen, I have given so much to this department and position.
Stephen, I really think this may take some time. Can we meet a little later to discuss and give me some time to process all of this. I think we need to discuss this?
B4a
I really thought you would see this as an opportunity. I am surprised that you would view this as something impacting your commitment to us. I have to say I am pretty disappointed.
B4b
I thought you were more of a team player than this.
B4c
Well, I am not sure how much discussing this will help, but if you need to meet, let's meet at 2:00pm.
Choose technique to respond with
Coach2a
As might be expected, you have received a defensive response. Shifting gears here will offer some opportunities?
Listen to the last response again, select the type of response verus the actual response.
Coach2b
You have missed some choices that might have avoided this level of defensiveness by your co-worker. One important element of Shifting Gears, is that you can recover by returning to an appropriate response.
Listen to the last response again, select the type of response verus the actual response.
Coach2c
This conversation is just beginning, so listen to the last response again, and select the type of response you would use to begin this discussion.


Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
Responses based on technique selected
Coach 3a
Good job! The confrontive I-message is an effective response at this point.
Coach 3b
Good job! Active Listening is an effective response at this point.
Feedback for incorrect responses
Coach 3c
Good job! This is a good opportunity for a Door Opener, like "I appreciate your understanding, I hope you would speak to me if I did the same thing."
Coach 3d
Your selection is not the most effective response.
Replay of last response
B4a
I really thought you would see this as an opportunity. I am surprised that you would view this as something impacting your commitment to us. I have to say I am pretty disappointed.
B4b
I thought you were more of a team player than this.
B4c
Well, I am not sure how much discussing this will help, but if you need to meet, let's meet at 2:00pm.
So, you view this as an opportunity for our section.
So, you feel this reflects my commitment to the team.
You should know that inconsistency in management impacts the troops.
I regret that you are disappointed but I hope you understand how this decision could force me into a difficult place.
Stephen, I hope my work represents my support for the team.
So, your intent was just to motivate them and strengthen the relationships.
I should have been consulted in these plans.
Stephen, I should have been consulted in these plans.
I still need to communicate to you my concern over your speaking negatively to my employees on my schedules.
Proceed to individual pages

Simulation 3
Shifting Gears with Coworker



Coach 1
In this simulation, the Behavior Window reference will be available upon your selection of the Window icon. In this simulation, all audio responses are coming from Betsy, your boss, and all text-based responses shown as bubbles are your statement decisions. Remember to select responses that achieve behavioral change, maintain your employee's self-esteem, and enhances the relationship.

SIM-MODULE 3: A Co-Worker

You are a team leader for a software development company with mostly government based clients. Within your company, team leaders manage different processes of the program development cycles. Your team consists of 10 team members made up of developers, programmers, and technical writers. Each cycle is dependent on the other teams weekly goals and all of the team members work in close quarters within the main development center. All team leader and business unit leader offices are on the second floor.

Sylvia, one of your co-team leaders is very outgoing, competitive, and technically skilled. She is always engaging employees and sometimes shares comments that you feel discount other team leader's instructions or processes.

After communicating a new work schedule, which is challenging for your team members because of weekend work, you overhear Sylvia discussing the schedule change and how it was not necessary for some of your team. This behavior is impacting some of your team member's statements about the new schedule and could impact production.

You see an opportunity to discuss this with Sylvia while in the elevator and initiate the discussion.

Decision Statements

I noticed you mentioned the new schedules weren't necessary to my team this morning. Did I hear that correctly?

I need to share with you that I am pretty concerned over what appeared to be discounting my new schedule with my team. They are not totally used to it yet, and this could impact their work and create some confusion over why it was done.

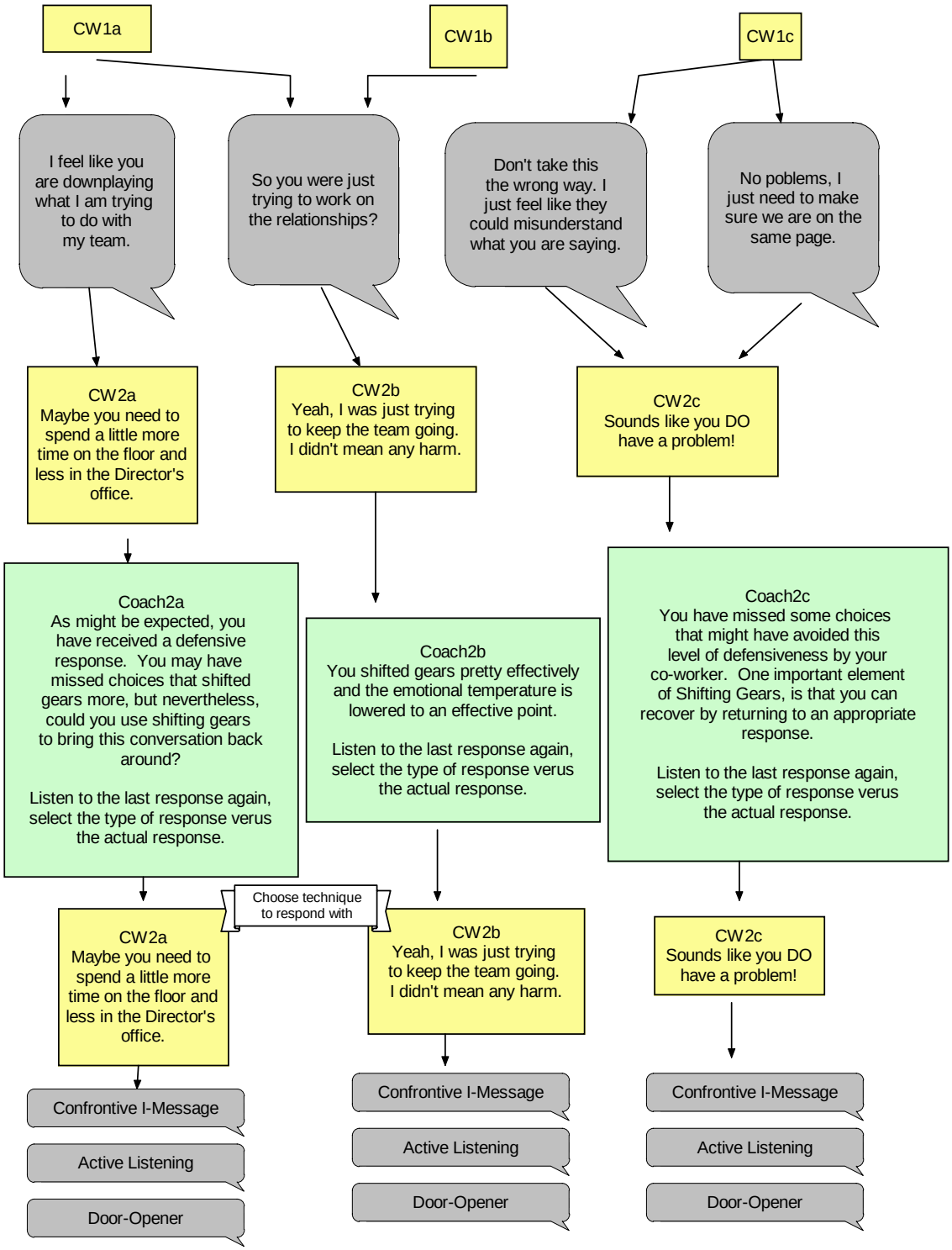
I would appreciate if you would focus more on your team and not mine.

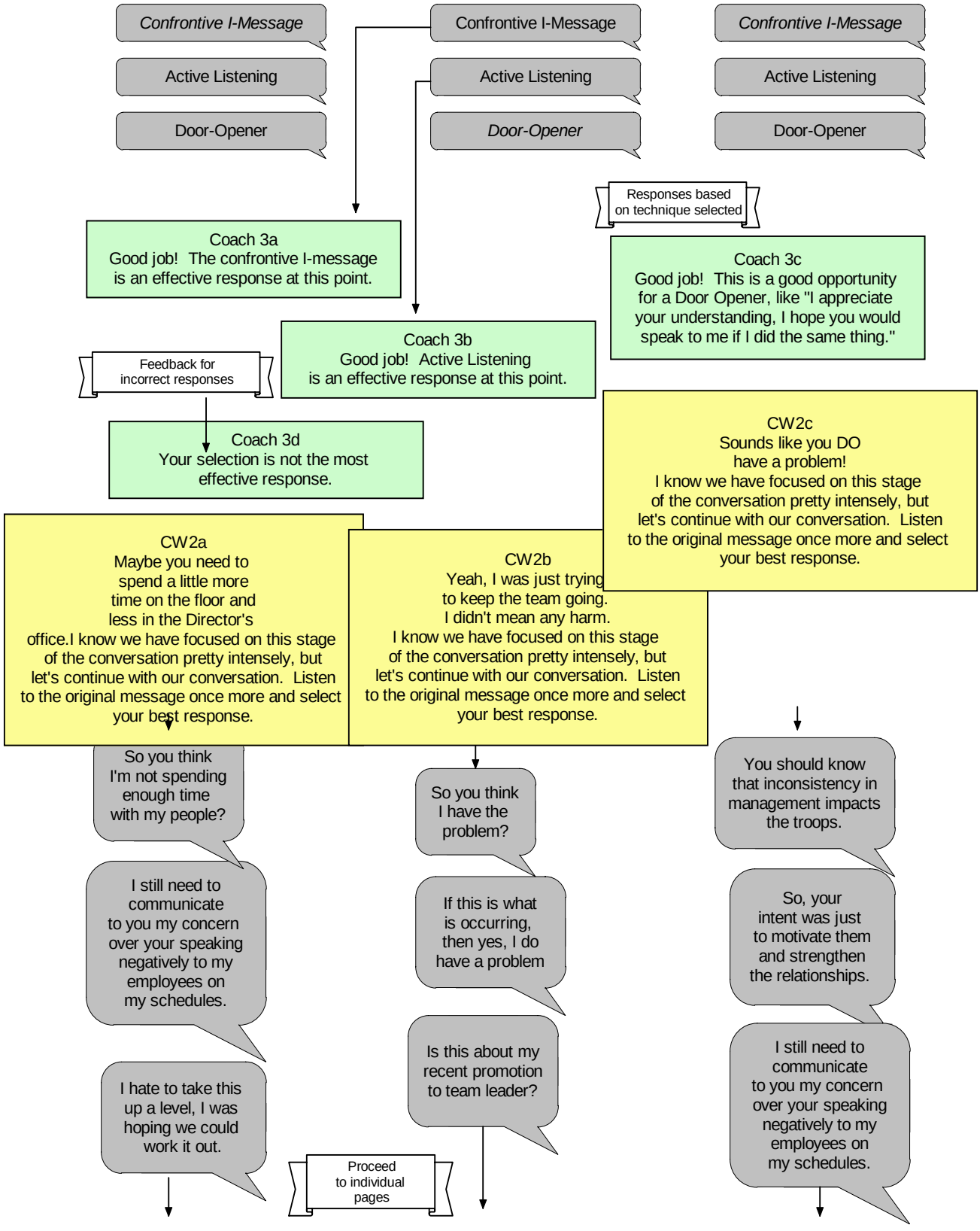
Audio Responses

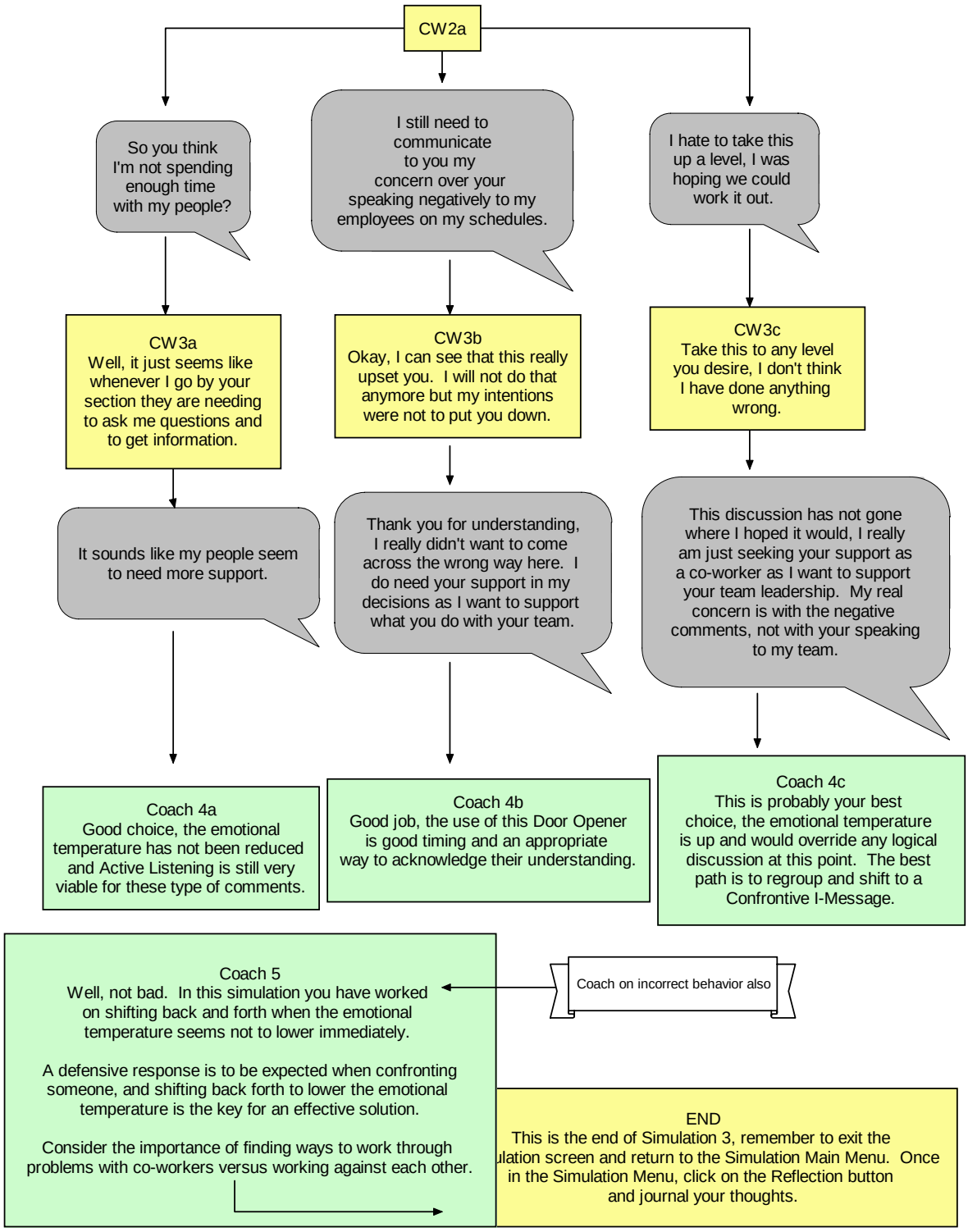
CW1a
I did speak to your employees about a couple of things. What's the problem?

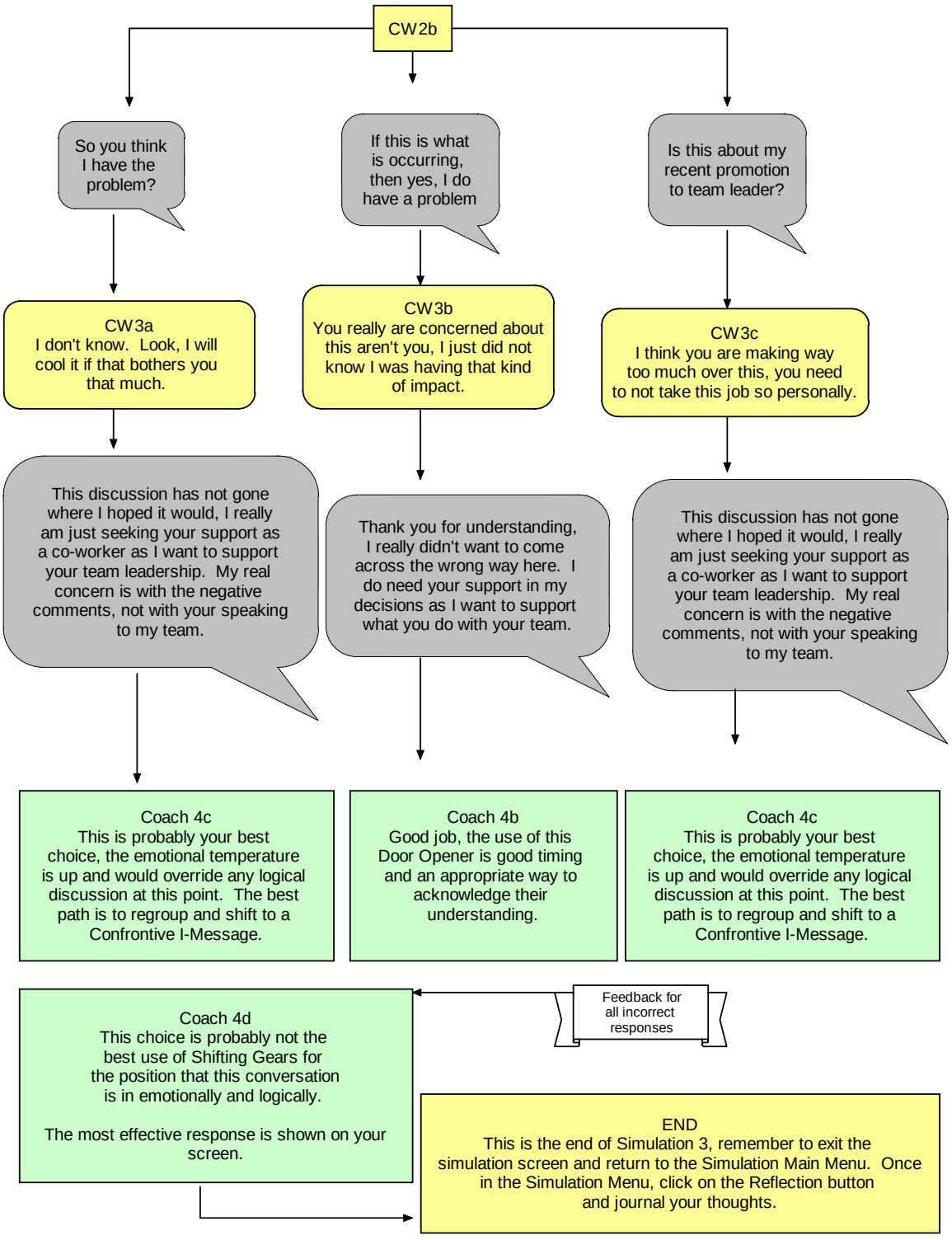
CW1b
Discounting. I am not sure I understand what you are concerned about. I did speak to them and I always try to keep the relationships strong between our teams.

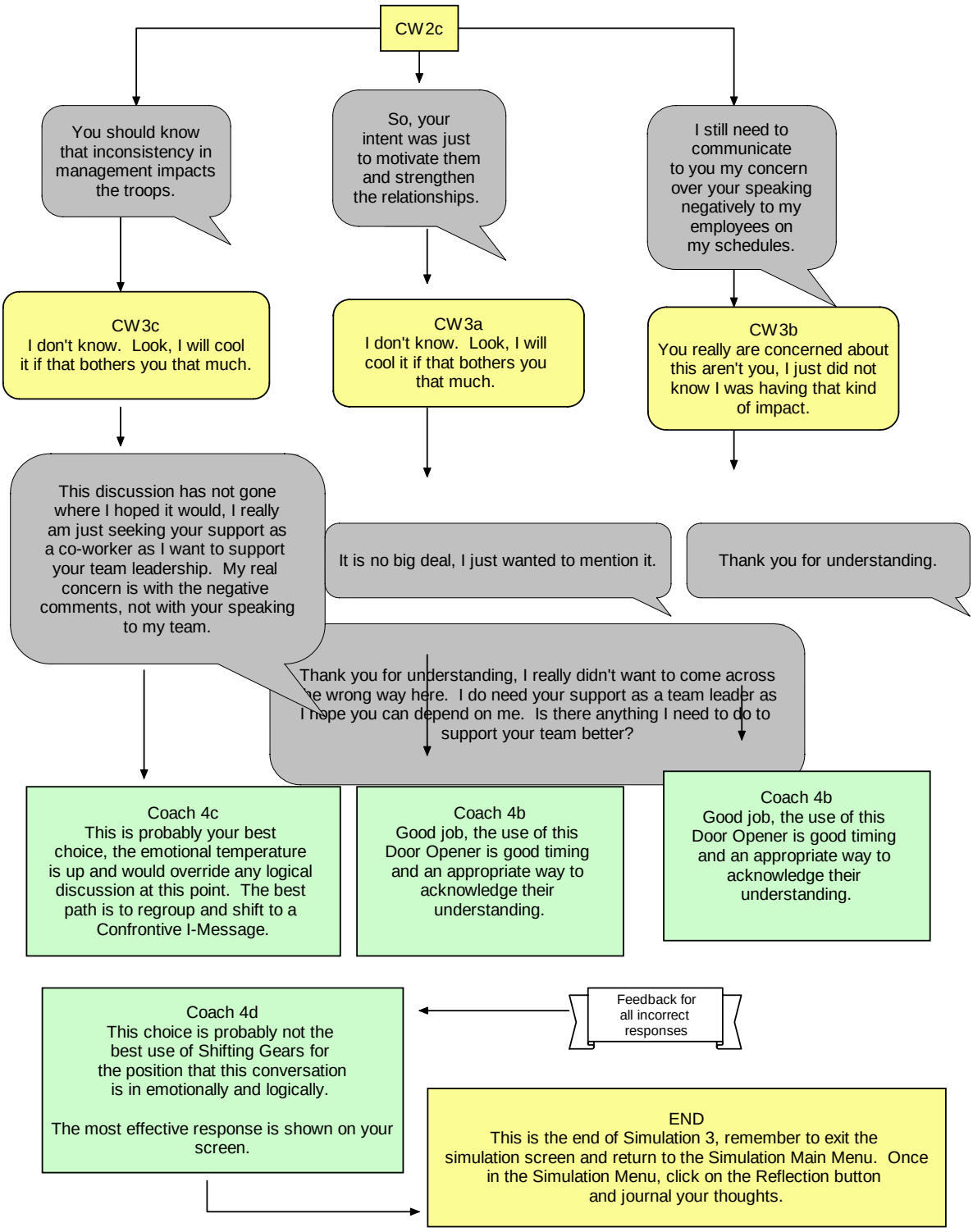
CW1c
What's your problem? They seem to like that when I touch base with them ever so often.


CW1a
CW1b
CW1c
I feel like you are downplaying what I am trying to do with my team.
So you were just trying to work on the relationships?
Don't take this the wrong way. I just feel like they could misunderstand what you are saying.
No poblems, I just need to make sure we are on the same page.
CW2a
Maybe you need to spend a little more time on the floor and less in the Director's office.
CW2b
Yeah, I was just trying to keep the team going. I didn't mean any harm.
CW2c
Sounds like you DO have a problem!
Coach2a
As might be expected, you have received a defensive response. You may have missed choices that shifted gears more, but nevertheless, could you use shifting gears to bring this conversation back around?
Listen to the last response again, select the type of response verus the actual response.
Coach2b
You shifted gears pretty effectively and the emotional temperature is lowered to an effective point.
Listen to the last response again, select the type of response verus the actual response.
Coach2c
You have missed some choices that might have avoided this level of defensiveness by your co-worker. One important element of Shifting Gears, is that you can recover by returning to an appropriate response.
Listen to the last response again, select the type of response verus the actual response.
Choose technique to respond with
CW2a
Maybe you need to spend a little more time on the floor and less in the Director's office.
CW2b
Yeah, I was just trying to keep the team going. I didn't mean any harm.
CW2c
Sounds like you DO have a problem!
Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener


Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
Confrontive I-Message
Active Listening
Door-Opener
Responses based on technique selected
Coach 3a
Good job! The confrontive I-message is an effective response at this point.
Coach 3c
Good job! This is a good opportunity for a Door Opener, like "I appreciate your understanding, I hope you would speak to me if I did the same thing."
Coach 3b
Good job! Active Listening is an effective response at this point.
Feedback for incorrect responses
Coach 3d
Your selection is not the most effective response.
CW2c
Sounds like you DO have a problem!
I know we have focused on this stage of the conversation pretty intensely, but let's continue with our conversation. Listen to the original message once more and select your best response.
CW2a
Maybe you need to spend a little more time on the floor and less in the Director's office.I know we have focused on this stage of the conversation pretty intensely, but let's continue with our conversation. Listen to the original message once more and select your best response.
CW2b
Yeah, I was just trying to keep the team going. I didn't mean any harm.
I know we have focused on this stage of the conversation pretty intensely, but let's continue with our conversation. Listen to the original message once more and select your best response.
So you think I'm not spending enough time with my people?
I still need to communicate to you my concern over your speaking negatively to my employees on my schedules.
I hate to take this up a level, I was hoping we could work it out.
So you think I have the problem?
If this is what is occurring, then yes, I do have a problem
Is this about my recent promotion to team leader?
You should know that inconsistency in management impacts the troops.
So, your intent was just to motivate them and strengthen the relationships.
I still need to communicate to you my concern over your speaking negatively to my employees on my schedules.
Proceed to individual pages


CW2a
So you think I'm not spending enough time with my people?
I still need to communicate to you my concern over your speaking negatively to my employees on my schedules.
I hate to take this up a level, I was hoping we could work it out.
CW3a
Well, it just seems like whenever I go by your section they are needing to ask me questions and to get information.
CW3b
Okay, I can see that this really upset you. I will not do that anymore but my intentions were not to put you down.
CW3c
Take this to any level you desire, I don't think I have done anything wrong.
It sounds like my people seem to need more support.
Thank you for understanding, I really didn't want to come across the wrong way here. I do need your support in my decisions as I want to support what you do with your team.
This discussion has not gone where I hoped it would, I really am just seeking your support as a co-worker as I want to support your team leadership. My real concern is with the negative comments, not with your speaking to my team.
Coach 4a
Good choice, the emotional temperature has not been reduced and Active Listening is still very viable for these type of comments.
Coach 4b
Good job, the use of this Door Opener is good timing and an appropriate way to acknowledge their understanding.
Coach 4c
This is probably your best choice, the emotional temperature is up and would override any logical discussion at this point. The best path is to regroup and shift to a Confrontive I-Message.
Coach 5
Well, not bad. In this simulation you have worked on shifting back and forth when the emotional temperature seems not to lower immediately.
A defensive response is to be expected when confronting someone, and shifting back forth to lower the emotional temperature is the key for an effective solution.
Consider the importance of finding ways to work through problems with co-workers versus working against each other.
Coach on incorrect behavior also
END
This is the end of Simulation 3, remember to exit the ulation screen and return to the Simulation Main Menu. Once in the Simulation Menu, click on the Reflection button and journal your thoughts.


CW2b
So you think I have the problem?
If this is what is occurring, then yes, I do have a problem
Is this about my recent promotion to team leader?
CW3a
I don't know. Look, I will cool it if that bothers you that much.
CW3b
You really are concerned about this aren't you, I just did not know I was having that kind of impact.
CW3c
I think you are making way too much over this, you need to not take this job so personally.
This discussion has not gone where I hoped it would, I really am just seeking your support as a co-worker as I want to support your team leadership. My real concern is with the negative comments, not with your speaking to my team.
Thank you for understanding, I really didn't want to come across the wrong way here. I do need your support in my decisions as I want to support what you do with your team.
This discussion has not gone where I hoped it would, I really am just seeking your support as a co-worker as I want to support your team leadership. My real concern is with the negative comments, not with your speaking to my team.
Coach 4c
This is probably your best choice, the emotional temperature is up and would override any logical discussion at this point. The best path is to regroup and shift to a Confrontive I-Message.
Coach 4b
Good job, the use of this Door Opener is good timing and an appropriate way to acknowledge their understanding.
Coach 4c
This is probably your best choice, the emotional temperature is up and would override any logical discussion at this point. The best path is to regroup and shift to a Confrontive I-Message.
Feedback for all incorrect responses
Coach 4d
This choice is probably not the best use of Shifting Gears for the position that this conversation is in emotionally and logically.
The most effective response is shown on your screen.
END
This is the end of Simulation 3, remember to exit the simulation screen and return to the Simulation Main Menu. Once in the Simulation Menu, click on the Reflection button and journal your thoughts.


CW2c
You should know that inconsistency in management impacts the troops.
So, your intent was just to motivate them and strengthen the relationships.
I still need to communicate to you my concern over your speaking negatively to my employees on my schedules.
CW3c
I don't know. Look, I will cool it if that bothers you that much.
CW3a
I don't know. Look, I will cool it if that bothers you that much.
CW3b
You really are concerned about this aren't you, I just did not know I was having that kind of impact.
This discussion has not gone where I hoped it would, I really am just seeking your support as a co-worker as I want to support your team leadership. My real concern is with the negative comments, not with your speaking to my team.
It is no big deal, I just wanted to mention it.
Thank you for understanding.
Thank you for understanding, I really didn't want to come across the wrong way here. I do need your support as a team leader as I hope you can depend on me. Is there anything I need to do to support your team better?
Coach 4c
This is probably your best choice, the emotional temperature is up and would override any logical discussion at this point. The best path is to regroup and shift to a Confrontive I-Message.
Coach 4b
Good job, the use of this Door Opener is good timing and an appropriate way to acknowledge their understanding.
Coach 4b
Good job, the use of this Door Opener is good timing and an appropriate way to acknowledge their understanding.
Coach 4d
This choice is probably not the best use of Shifting Gears for the position that this conversation is in emotionally and logically.
The most effective response is shown on your screen.
Feedback for all incorrect responses
END
This is the end of Simulation 3, remember to exit the simulation screen and return to the Simulation Main Menu. Once in the Simulation Menu, click on the Reflection button and journal your thoughts.

APPENDIX C

Project Overview Charts

Gant Chart

Development Resource Website

Asynchronous Review Module Research Methodology Process

Formative Review

Gant Chart

Complete	**Leader Effectiveness Training** / ***Review Module Development***	**Sept** **2004**	**Oct**	**Nov**	**Dec**	**Jan** **2005**	**Feb**	**Mar**	**Apr**	**May**
X	*Obtain GTI Permission*	1								
X	*Learning Goal Worksheets*									
X	*User Interface Rating Instrument*									
X	*Permission for Elearning Scale Instrument*									
X	*Develop IRB Online Implied Consent*									
X	*Develop Evaluation Website*									
X	*IRB Submittal*		1							
X	*Communicate to GTI-Expert Review Panel*		15							
X	*Develop Objectives-LET*									
	Prospectus Exam		25							
	Objectives - Expert Review Panel									
	Finalize Module Main Interface									
	Reserve Lab RHEC- Small Group									
	Develop Storyboards-Behavior Window									
	Develop Storyboards-Active Listening									
	Develop Storyboards-Confrontive-I Msg.									
	Develop Storyboards-Shifting Gears									
	Develop Sub-Modules (no audio/video)									
	Technical Delivery Test									

	Leader Effectiveness Training	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**
Complete	***Review Module Development***	**2004**				**2005**				
	Small Group - Focus Groups/Interviews									
	Write Sims-Paper Based									
	Sim Solution Rating- Expert Review Panel									
	Develop Storyboards- SIMmodules									
	Sub-Modules & SIM Audio Development									
	Sub-Modules Video Development									
	Refine Sub-Modules/Add Audio-Video									
	Develop SIMmodule 1									
	Field Trial 1									
	Analyze data/Revise									
	Develop SIMmodule 2 & 3									
	Field Trial 2									
	Analyze data/revise									
	Submit Module to ASTD eLearning Cert.									
	Write Conclusion *Defend Dissertation*									

Development Resource Website

Welcome to the resource page

for research entitled:

The Development of an Asynchronous Post-Instructional Review Module on Interpersonal Communications

By doctoral candidate, Randall J. Hollandsworth.

In partial fulfillment of the requirements for the degree of Doctor of Philosophy in Curriculum and Instruction (Instructional Technology) at Virginia Polytechnic Institute and State University.

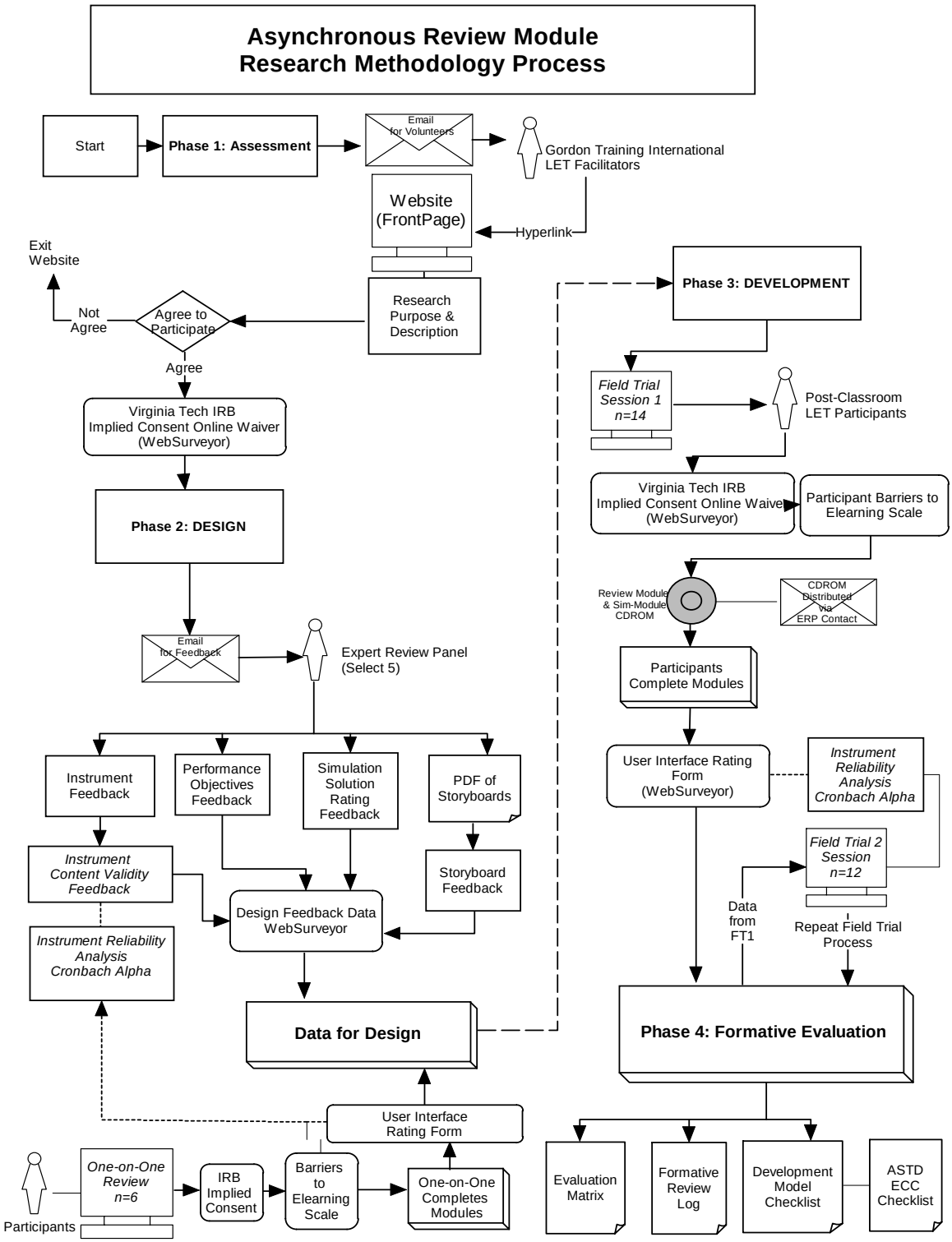
To begin working with this research project, you must first complete an online IRB

Implied Consent Waiver (click the IRB button below).

Virginia Tech IRB

Doctoral Committee: Dr. Barbara Lockee, Co-chair, Dr. John Burton, Co-chair, Dr. Terry Wildman, Dr. Kurt Eschenmann, & Dr. Tom Wilkinson

For information on research or any related resources, contact R. J. Hollandsworth at rholland@vt.edu.


Asynchronous Review Module
Research Methodology Process
Start
Phase 1: Assessment
Email for Volunteers
Gordon Training International LET Facilitators
Website (FrontPage)
Hyperlink
Exit Website
Not Agree
Agree to Participate
Agree
Research Purpose & Description
Virginia Tech IRB Implied Consent Online Waiver (WebSurveyor)
Phase 2: DESIGN
Email for Feedback
Expert Review Panel (Select 5)
Instrument Feedback
Performance Objectives Feedback
Simulation Solution Rating Feedback
PDF of Storyboards
Instrument Content Validity Feedback
Storyboard Feedback
Design Feedback Data WebSurveyor
Instrument Reliability Analysis Cronbach Alpha
Data for Design
User Interface Rating Form
Participants
One-on-One Review n=6
IRB Implied Consent
Barriers to Elearning Scale
One-on-One Completes Modules
Phase 3: DEVELOPMENT
Field Trial Session 1 n=14
Post-Classroom LET Participants
Virginia Tech IRB Implied Consent Online Waiver (WebSurveyor)
Participant Barriers to Elearning Scale
Review Module & Sim-Module CDROM
CDROM Distributed via ERP Contact
Participants Complete Modules
User Interface Rating Form (WebSurveyor)
Instrument Reliability Analysis Cronbach Alpha
Field Trial 2 Session n=12
Data from FT1
Repeat Field Trial Process
Phase 4: Formative Evaluation
Evaluation Matrix
Formative Review Log
Development Model Checklist
ASTD ECC Checklist

FORMATIVE REVIEW LOG

SCREEN	COMMENTS & SUGGESTIONS	ACTIONS TAKEN
RM 11/27/04	Tool book – RM went very well – BUGS OK	Designed Template Books 11/27/04
	Reports Scoring Page Sims worked Fine Book/Library	
ERP 12/1/04	DATA on Surveys Received	
1/10	Storyboards -	went to Qualitative Approach - flowcharts
2/1/05	Sims Complete – 1	Test Audio
		Sent Modules – Gordon Intern
1/24	Feedback Sims	– email – Lolo Kouba
	– content – complex –	– phone – GTI M+L
		media Equation - Movement Depth of Field
	Layers – cycles – interplay	
Feb	Development Continues	used NON-VIDEO in
	– Struggles with video	SG FTI until
	+ audio file testing	worked out.
Feb March	Volvo Small Groups.	
	– Key * managers like virtual Role plays	
	over ~~face-to-face~~ - *	
Feb	Worked on INSTALL procedures	LOAD to PC
	+ Instructions	only link
		All else remains
		on CD – Consistency
		Online App – Ruled out

FORMATIVE REVIEW LOG

SCREEN	COMMENTS & SUGGESTIONS	ACTIONS TAKEN
March	FTI – CDs Shipped	
	Feedback heavy on navigation & orienting	
	in course	→ Changed Interfaces
		to allow Table of Contents
		& navigational capabilities
	FTI & SG - Feedback	
	on Simulation progress	
	& Feedback	
		→ Progress bars Added
		to Sims &
March	Gordon Feedback on	worked on content
	Sims -	& flow - tried
		to clarify tools
		and decision points
March	Shipped CDROMs FTI	
	on March 11 - stuck	
	in Customs 10 days	
	[illegible]	Received 3-21-05

146

FORMATIVE REVIEW LOG

SCREEN	COMMENTS & SUGGESTIONS	ACTIONS TAKEN
March	FT2 Data – 22–24	
	(some used same COPE label)	Contacted Karen S.
	verification w/ Contact	
	(comments indicate different evals)	

APPENDIX D

Developmental Standards

ASTD e-Learning Courseware Certification Checklist

Developmental Model Checklist

ASTD **E-Learning Courseware Certification (ECC)**

Self-Assessor Tool

These standards address the relationship between the learner and the courseware itself.

Standard 1. Orientation (Substitutable; Cutoff Score = 7)

Standard 2. Tracking Features (Substitutable; Cutoff Score = 9)

Standard 3. Required Navigational Functions (Non-Substitutable; Cutoff Score = 12)

Standard 4. Optional Navigational Devices (Substitutable; Cutoff Score = 6)

Standard 5. Operational Support (Substitutable; Cutoff Score = 10)

These standards address the relationship between the courseware, the operating system, and related applications.

Standard 6. Installation and Initial Launching (Non-Substitutable; Cutoff Score = 6)

Standard 7. Set Up (Substitutable; Cutoff Score = 6)

Standard 8. Subsequent Launching (Substitutable; Cutoff Score = 6)

Standard 9. Uninstalling (Substitutable; Cutoff Score = 3)

These standards examine the quality of the courseware's text, graphics, grammar and visual presentation.

Standard 10. Legibility of Text and Graphics (Non-Substitutable; Cutoff Score = 7)

Standard 11. Formatting and Internal Consistency (Substitutable; Cutoff Score = 8)

These standards examine the relationship between the course purpose, objectives, instructional content, instructional methods, and the learner.

Standard 12. Expression of Course Purpose (Substitutable; Cutoff Score = 4)

Standard 13. Presence of Instructional Objectives (Substitutable; Cutoff Score = 5)

Standard 14. Consistency of Objectives With Course Content (Substitutable; Cutoff Score = 6)

Standard 15. Presentation and Demonstration (Non-Substitutable; Cutoff Score = 8)

Standard 16. Practice with Feedback (Non-Substitutable; Cutoff Score = 1)

Standard 17. Engagement Techniques (Substitutable; Cutoff Score = 6)

Standard 18. Assessment of Learning (Substitutable; Cutoff Score = 6)

Developmental Model Page 1 of 3

Based on the ASTD eLearning Certification Process

Relatio nship	Learner & Courseware	Small Group	Notes	Field Trial	Notes	Field Trial	Notes
1	Orientation		Introduction page and audio pages for Review Module (RM) and Sim Modules (SM)	1	No change	2	No change
2	Tracking Features		Module name used for RM, none for SM	1	No change	2	Progress tracking added to Sims
3	Required Navigational Functions		Forced navigation to IRB and Elearning Barriers	1	Same	2	Same
4	Optional Navigational Devices		Constructivist approach used to allow movement to modules and sims based on learner selection	1	Same	2	IRB and Elearning Barriers removed, forced link to assessment and user rating form.
5	Operational Support		On-site pilot testing on laptops, n/a	1	On-site coordinator supports along with web-site and hard copy instructions.	2	Same as FT1
6	Installation and Initial Launching		On-site pilot testing on laptops, n/a	1	Instructions provided via website and on CD Jewel Case	2	Instructions on web-site and cases updated based on feedback for particular computer drives and specs from St Joesph's contact person.
7	Set Up		On-site pilot testing on laptops, n/a	1	Step-by-step instructions provided in visual format, piloted locally at RU	2	Adaptations made via Cd cover instructions, and all media and files left on CD with download link only moving to PC.
8	Subsequent Launching		On-site pilot testing on laptops, n/a	1	Once loaded on PC with native Toolbook players, launch from programs menu	2	No changes made, except for one error message which was debugged and removed.
9	Uninstalling		On-site pilot testing on laptops, n/a	1	Uninstall provided as option on programs menu	2	Same

Developmental Model Checklist Page 2 of 3

Quality	Text, Graphics, Grammar, and Visual Presentation	*Small Group*	*Notes*	*Field Trial*	*Notes*	*Field Trial*	*Notes*
10	**Legibility of Text and Graphics**		Use of small group for feedback on this	1	User ratings	2	Use of new interface along with feedback from FT1
11	**Formatting and Internal Consistency**		Reviews	1	internal quality controls	2	User ratings and internal quality controls
Relationship	Course Purpose, Objectives,	*Small Group*	*Notes*	*Field Trial*	*Notes*	*Field Trial*	*Notes*
12	**Expression of Course Purpose**		Delivered in person	1	Orientation pages	2	Orientation pages and introductory videos
13	**Presence of Instructional Objectives**		No objectives displayed	1	No objectives displayed	2	Objectives added
14	**Consistency of Objectives With Course Content**		Program built from Expert review panel's feedback on objectives and learning outcome rankings	1	Program built from Expert review panel's feedback on objectives and learning outcome rankings	2	Revisited Learning Goal worksheets to ensure consistency

Relationship	Instructional Content, Instructional Methods, and the Learner:	*Small Group*	*Notes*	*Field Trial*	*Notes*	*Field Trial*	*Notes*
15	**Presentation and Demonstration**		Use of audio files and interactive activities	1	Same audio and activities applied	2	Introduced video-based credibility statements
16	**Practice with Feedback**		RM interactive events offer both audio and textual based feedback, including assessment scoring.	1	Same as SG	2	Added hard feedback to simulations with progress bar.
17	**Engagement Techniques**		Lots of interactive events, requiring activity every few seconds	1	Same as SG	2	Simulations require continuous activity and decision making.
18	**Assessment of Learning**		Only pre-review assessment provided to assess if RMs are observed	1	Same as SG	2	Progress bar offering hard feedback on simulation decisions and interactions.

APPENDIX E

Data Collection Protocol Guides and Instructions

Design

Expert Review Panel Procedural Instructions

Development

Participant Procedural Instructions

Small Group Interview Protocol

Expert Review Panel Procedural Instructions

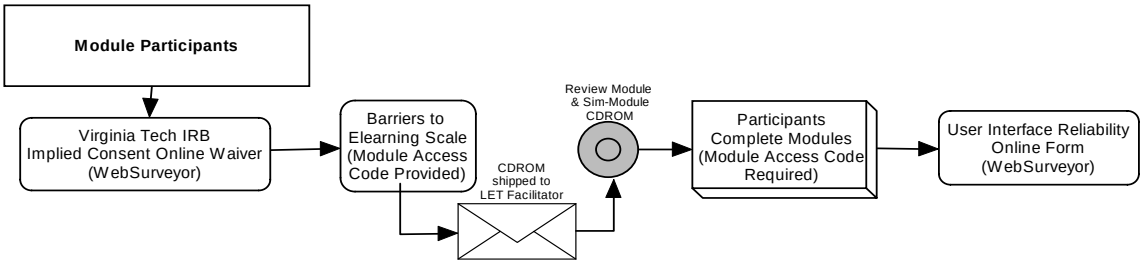
The use of Gordon Training International certified facilitators offers the expertise of both content and delivery for LET participants. A selection of five to seven facilitators will be selected to support this research and review module development. The areas that facilitators will support are:

- **Content validation of a pre- and post-survey evaluative instrument**
- **Feedback on the learning performance objectives for the modules**
- **Rating of simulation solutions**
- **Evaluation of review module and sim-module storyboards for module development**

Participation by facilitators on the Expert Review Panel will require reading and submitting a Virginia Tech IRB Implied Consent Waiver for this developmental research project. Facilitators will have access to the Development Resource Website, which will house links to Websurveyor feedback tools, PDF files containing module storyboards, and ongoing research information. The link to the Development Resource Website and links to Websurveyor feedback tools will be emailed to all participants in early November, 2005.

If you have any questions or need any support in this research process, please contact the researcher, Randy Hollandsworth, at (540)-831-6712 or by email rholland@vt.edu.

Participant Procedural Instructions



Participants that agree to participate in the developmental research of the post-LET class online review module will need to complete the following online waivers, surveys, and evaluations available through your contact email and at the Development Resource Website (http://filebox.vt.edu/users/rholland/DRW.htm):

Pre-Module

- **Virginia Tech IRB Implied Consent Online Waiver**
- **Survey of Participant Barriers to Elearning**

Post-Module

- **User Interface Rating Form**

Once the pre-module IRB Implied Consent form and the Barriers to Elearning Scale instrument are completed, the participant will be able to access the module from the CDROM provided. The module will initially request a MODULE ACCESS CODE provided upon completion of the Barriers to Elearning Scale survey, **REMEMBER TO JOT DOWN THE MODULE ACCESS CODE**. Once in the module the navigation is defined during the introduction of the module and support is available both online and via the following contact information: **If you have any questions or need any support in this research process, please contact the researcher, Randy Hollandsworth, at (540)-831-6712 or by email rholland@vt.edu.**

One-on-One Review Interview Protocol

Interviews are a powerful means of collecting data about learner or instructor reactions to a new interactive multimedia program.

Instructions: The overall steps in the interview process are:

a. Organize the group.
b. Determine the development goals.
c. Generate the questions.
d. Construct an interview agenda.
f. Administer the interviews.
h. Analyze the data.
i. Share and use the results.

EVALUATION INTERVIEW PROTOCOL

Name: _____ Interviewer: _____ Date: _____

1. What is your current position?

2. How many years and months in present position? _____years _____months

3. Please describe your use of the LET skills since the class-based workshop?

4. Please describe your first reactions to this LET Review Modules and Sim-modules.

5. Please describe your present opinions of LET Review Modules and Sim-modules.

6. Do you need additional training for the LET skills?

7. To what degree did you accomplish the performance objectives established for the LET Review Modules and Sim-modules?

8. What would you tell another person about to take the LET Review Modules and Sim-modules for the first time?

9. What improvements would you recommend for the LET Review Modules and Sim-modules overall?

10. What is your opinion of the interactive multimedia system used to deliver this course?

APPENDIX F

Informed Consent

Informed Consent Questionnaire

IRB Application

IRB Letter for Expedited Review Acceptance

Virginia Tech
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Institutional Review Board

Dr. David M. Moore
IRB (Human Subjects) Chair
Assistant Vice President for Research Compliance
CVM Phase II, Duckpond Dr., Blacksburg, VA 24061-0442
Office: 540/231-4991, FAX: 540/231-6033
email: moored@vt.edu

DATE: December 15, 2004

MEMORANDUM

TO: Barbara B. Lockee Teaching and Learning 0313
Randall Hollandsworth

FROM: David Moore

SUBJECT: **IRB Expedited Approval:** "The Development of an asynchronous Review Module on Interpersonal Communication" IRB # 04-627

This memo is regarding the above-mentioned protocol. The proposed research is eligible for expedited review according to the specifications authorized by 45 CFR 46.110 and 21 CFR 56.110. As Chair of the Virginia Tech Institutional Review Board, I have granted approval to the study for a period of 12 months, effective December 15, 2004.

Virginia Tech has an approved Federal Wide Assurance (FWA00000572, exp. 7/20/07) on file with OHRP, and its IRB Registration Number is IRB00000667.

cc: File
Department Reviewer Jan Nespor T&L 0313

Virginia Polytechnic Institute & State University Survey Informed Consent

Thank you for your participation in this research entitled: THE DEVELOPMENT OF AN ASYNCHRONOUS POST-INSTRUCTIONAL MODULE ON INTERPERSONAL COMMUNICATIONS. In order to access the online LET module, please complete the following questions regarding your informed consent and participation in this research. RESEARCH PURPOSE PROCEDURES: After completion and submittal of this Informed Consent Survey, an online post-LET(ECW) Instructional Module may be accessed. Upon completion of the module, an online survey will be administered offering feedback on either usability or acceptance. INSTRUCTIONS: Click on the responses "I Understand" to continue in the survey and study. You may cancel out of the surveys or module at any time.

---

1) There are no anticipated risks as a result of this research to participants beyond those experienced in everyday activity.

☐ I understand

2) The results of this study will be kept confidential. Neither your name nor any other personal identifier will be associated with any information you supply.

☐ I understand

3) This project will contribute to concept reinforcement and skill transfer of interpersonal skills presented in the Gordon Training International Leader Effectiveness Training or Effective Communications Workshops.

☐ I understand

4) There is no compensation for participating in this research.

☐ I understand

5) Participants are free to withdraw from this study at any time. During the course of any surveys or modules provided in this developmental research, you may exit at any time by selecting the "Exit" button.

☐ I understand

6) This research project has been approved, as required, by the Institutional Review Board at Virginia Tech for Research Involving Human Subjects.

☐ I understand

7) Please type in the initial of your first name and last name (ex. T. Smith):

8) Please type in the city and state where your initial Leader Effectiveness Training or Effective Communication Workshop occurred (ex. Portland, OR):

9) Please enter your email address:

10) Participants must voluntarily agree to participate in this study, which includes a series of online modules related to Gordon Training International's Leader Effectiveness Training and a follow-up evaluation survey concerning either acceptance and/or usability.

☐ I understand

PARTICIPANT'S PERMISSION: I have read and understood the Informed Consent questions for survey participants and the conditions of this research project. I hereby acknowledge the above questions and give my voluntary consent for participation in this project. If I participate, I may withdraw at any time without penalty. I indicate my agreement by selecting the "Submit" button below, or I may choose not to participate by selecting the "Cancel" button below. If you have any questions, contact: Randy Hollandsworth, Researcher (540)-831-6712 or email rhollands@vt.edu, Dr. Barbara Lockee, Doctoral Committee Chair (540)-231-5587 or lockeebb@vt.edu, or Dr. David Moore, Institutional Review Board Chair for Virginia Tech (540)-231-4991 or moored@vt.edu.

Submit Survey

APPENDIX G

Evaluation Instruments

Survey of Participant Barriers to Elearning

One-on-One Review: Survey of Participant Barriers to Elearning Results

Field Trial One: Survey of Participant Barriers to Elearning Results

Field Trial Two: Survey of Participant Barriers to Elearning Results

User Interface Rating Tool

Survey of Participant Barriers to eLearning Scale
Adapted from and used with permission
Zane L. Berge, Ph.D. and
Lin Muilenburg's
July, 2003 Version of Survey of Student Barriers to Online Learning

Type in the last four digits of your social security number: _____

Note: The above numerical code will not be given to anyone outside of this research study and will be kept confidential. Your numerical code will only be used to conduct a quantitative analysis between the results of this survey with the results of the post-module evaluative survey.

Instructions

For the purposes of this survey, the terms "eLearning", "online learning", and "computer-based learning" are used synonymously. These courses involve: a) a formal training or educational event/course in which the students are not face-to-face with each other, or they are not face-to-face with the instructor and (b) the delivery of the course is via the web, internet, intranet, CD, or a learning-/course-management system such as Blackboard, WebCT, (c) Courses delivered through video conferencing, distance education involving computer-mediated communications (ex. Email), audio or video tape, DVD, EPSS, radio, ITV, or print-based systems are **not** part of this research.

1. I would characterize myself regarding online learning most closely as:
   - ☐ I do not use online technology (such as email and the internet) very much.
   - ☐ I use online learning technologies such as email and the internet for my own personal productivity but not so much for education or training purposes.
   - ☐ I am learning online, but I am unsure of my skills when doing so.
   - ☐ I have learned, or I am learning online and feel comfortable and confident when I do so.

2. The statement that best describes how I view my learning effectiveness in elearning is:
   - ☐ I can not learn as well by computer as I can in the classroom with other learners and the instructor.
   - ☐ I really don't see much difference in my learning in an elearning environment compared to being in the classroom with other learners and the instructors.

- I learn better through elearning compared to being in the same room with other learners and the instructor.
- While I have never completed an elearning class, I predict I would not learn as well by computer as I would in the classroom with other learners and the instructor.
- While I have never completed an elearning class, I predict I would not see much difference in my learning in a computer-based learning environment compared to being in the classroom with other learners and the instructor.
- While I have never completed an elearning class, I predict I would learn better online, or by computer, compared to being in the classroom with other learners and the instructor.

3. The statement that best describes how I view my enjoyment of elearning compared to being in the same room as the instructor and other learners is:
   - I enjoy the elearning experience significantly less.
   - I really don't see much difference in my enjoyment between elearning and in the classroom with other learners and the instructor.
   - I enjoy the elearning experience significantly more.
   - While I have never completed an elearning class, I predict I would enjoy the learning experience significantly less by computer compared to being in the classroom with other learners and the instructor.
   - While I have never completed an elearning class, I predict I would not see much difference in my enjoyment of the computer learning environment compared to being in the classroom with other learners and the instructor.
   - While I have never completed an elearning class, I predict I would enjoy the learning experience significantly more by computer than being in the classroom with other learners and the instructor.

4. I have completed the following number of distance education courses. A distance education course is any training or education that is so designated by your school or organization to be taken online (Note: If you are taking a course now but have not completed it, do not count it in this answer):
   - 0
   - 1
   - 2
   - 3

- ☐ 4
- ☐ 5 - 7
- ☐ 8 - 10
- ☐ 11 - 13
- ☐ 14 or more

5. I have dropped the following number of distance education courses, even if I later completed one or more of these courses:
   - ☐ 0
   - ☐ 1
   - ☐ 2
   - ☐ 3
   - ☐ 4
   - ☐ 5 - 7
   - ☐ 8 - 10
   - ☐ 11 - 13
   - ☐ 14 or more
6. The likelihood that I will take an elearning course in the future if I am not required to do so is:
   - ☐ definitely not
   - ☐ probably not
   - ☐ probably yes
   - ☐ definitely yes
7. My cultural background, physical or other disability, or some prejudice of instructors or peers concerning a personal characteristic of mine significantly affects my learning in the traditional, bricks-and-mortar classroom with teacher and learners present together:
   - ☐ Yes
   - ☐ No

Instructions for Questions Regarding Barriers Below

Rate each of the barriers/obstacles below according to how strong you perceive that barrier to be to your most recent elearning student experience, or your desire to take an elearning course. Marking an item as a "very strong barrier," indicates that you feel that item is a very difficult obstacle to overcome. Marking the

intermediate responses of "weak," "moderate," or "strong," would indicate the relative weight you give that item as a barrier. Marking "no barrier" means you do not perceive that item as an obstacle to your study, or desire to study online.

We want to know YOUR PERSONAL PERCEPTIONS of elearning. Do not answer based on how you think elearning might affect others. Answer only how you personally feel about the issues below..

Note well that answering "no barrier" could mean several different things: that you believe "it does not apply to me", or that you "have the skills to deal with this barrier," or that you "have never experienced this barrier," or if you have never taken an elearning course, that "you would not experience this barrier" should you take an elearning class in the future At this point, we are not trying to determine why it is not a problem for you, only whether it is or is not an obstacle for you personally and to what degree if it is.

The survey is in six parts: technical, infrastructure/support services, social, prerequisite skills, motivation, and time/interruptions. A brief description is given at the beginning of each section. The pilot testing showed that it usually took between 11 and 13 minutes to complete.

Technical. Participants must be comfortable with a computer-based system and the software that is being using in elearning.

1. The needed technology (hardware or software) is not accessible to me.
   No Barrier Weak Barrier Moderate Barrier Strong Barrier Very Strong Barrier

2. I am afraid of losing privacy, confidentiality, or intellectual property in the elearning environment.
   No Barrier Weak Barrier Moderate Barrier Strong Barrier Very Strong Barrier

3. I am unfamiliar with the technical tools needed in elearning.
   No Barrier Weak Barrier Moderate Barrier Strong Barrier Very Strong Barrier

4. I lack a reliable internet connection, high speed connectivity, or an internet service provider.
   No Barrier Weak Barrier Moderate Barrier Strong Barrier Very Strong Barrier

5. The hardware, software, repairs, or a service provider costs too much.
   ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

6. I lack the skills necessary to navigate successfully through the delivery system in an elearning course.
   ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

7. I am afraid of computers and related technologies.
   ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

8. I am concerned about, or have found a lack of consistency in platforms, hardware, browsers, and software for elearning courses.
   ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

9. I lack the necessary skills in using the software for elearning courses.
   ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

10. I am concerned about, or have found a lack of technical assistance.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

11. I am uncomfortable with, or fear, learning how to use new tools to access elearning courses.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

12. I am uncomfortable with, or fear, learning with different methods used in elearning courses.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

13. I am concerned, or have found that a lack of compatibility of hardware and software creates technical problems.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong**

Barrier ☐ **Very Strong Barrier**

Infrastructure/Support Services From the students' perspective, these are issues that the instructor or organization control.

14. I am concerned about, or have found a lack of access to the instructor, or knowledgeable experts.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

15. I am concerned about, or have found a lack of timely feedback or response from the instructor.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

16. I have found or am concerned that the quality of the learning materials and instruction is lower in elearning courses.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

17. I have found or am concerned that instructors don't know what they are doing when they design or teach via elearning.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

18. I am concerned about, or have found a lack of clear expectations or instructions from elearning courses.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

19. There is insufficient training given in the use of the delivery system.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

20. I am concerned about, or have found a lack of support and services.
    ☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

21. I am concerned about, or have found that course materials are not always delivered on time.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

22. I have difficulty contacting administrative staff for elearning courses.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

23. Concern that I might be wasting my time if the courses or programs I take, or consider taking, lack accreditation, sanction by a recognized professional organization within the field, or that lack similar "official" recognition.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

Social. Although designed for independent learning, the learning environment that is created for elearning should be open in which learning is promoted.

24. Elearning is, or seems like it would be impersonal to me.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

25. I prefer to learn through face-to-face interaction with other students and instructor.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

26. I do, or I am afraid of feeling isolated from the other students in an elearning course.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

27. I am concerned about, or have found a lack of interaction and communication among students in elearning courses.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

28. I am concerned about, or have found a lack of social context cues (e.g., body language) in the elearning environment.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

29. I am concerned about, or have found a lack of collaboration with other students in elearning.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

Prerequisite Skills are areas that most students believe they need to have mastered to a certain degree before entering the elearning classroom.

30. I lack the writing skills needed in elearning courses.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

31. I lack the typing skills needed in elearning courses.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

32. I lack the reading skills needed in elearning courses.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

33. I lack the language skills needed in online courses.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

34. I lack the technical skills needed in online courses.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

Motivation has to do with the psychological processes that cause students to persist in meeting their learning goals.

35. I have to take on more of the responsibility for my own learning in an elearning course.

☐ **No Barrier** ☐ **Weak Barrier** ☐ **Moderate Barrier** ☐ **Strong Barrier** ☐ **Very Strong Barrier**

36. I lack the motivation to learn through elearning.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

37. I procrastinate, or feel I cannot seem to "get started to learn" in elearning programs.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

38. I choose to learn the easier aspects of the assignments rather than the more demanding ones.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

39. I have found or am concerned that the elearning environment is not inherently motivating.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

Time/Interruptions is a factor that has to do with the perceived barriers to your time in elearning and the interruptions that may disrupt your learning.

40. I am concerned about, or have found there is not sufficient time to learn during elearning courses.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

41. There are significant interruptions at work, home or wherever I study.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

42. I am concerned about, or have found a lack of support from family, friends, employers, or significant others.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

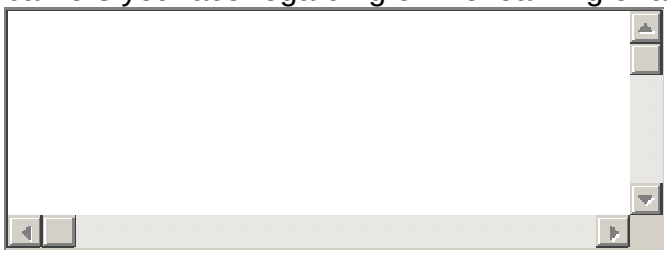
43. I am afraid my family life will be disrupted.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

44. Elearning would or does cut in to my personal time.

No Barrier **Weak Barrier** **Moderate Barrier** **Strong Barrier** **Very Strong Barrier**

COMMENTS: Please add any comments you may have, either about barriers you face regarding online learning or about the survey.



Appendix G

One-on-One Review results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Demographic	1. I would characterize myself regarding online learning most closely as:	Do not use technology 1 2 3 4 Comfortable and confident w/ technology	3.0±1.26	4.0	1.0
Demographic	2. The statement that best describes how I view my learning effectiveness in elearning is:	Cannot learn by computer 1 2 3 4 5 6 Learn Better by computer	3.5±1.87	6.0	1.0
Demographic	3. The statement that best describes how I view my enjoyment of elearning compared to being in the same room as the instructor and other learners is:	Enjoy elearning experience significantly less 1 2 3 4 5 6 Enjoy more	3.5±1.51	5.0	1.0
Demographic	4. I have completed the following number of distance education courses.	0 1 2 3 4 5-7 8-10 11-13 14 or more	2.1±.75	3.0	1.0

Appendix G

One-on-One Review results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Demographic	5. I have dropped the following number of distance education courses, even if I later completed one or more of these courses:	0 1 2 3 4 5-7 8-10 11-13 14 or more	1.0±.63	2.0	1.0
Demographic	6. The likelihood that I will take an elearning course in the future if I am not required to so is:	Definitely not 1 2 3 4 Definitely yes	2.6±.52	3.0	2.0
Demographic	7. My cultural background , physical or other disability, or some prejudice of instructors or peers concerning a personal characteristic of mine significantly affects my learning in the traditional, bricks-and-mortar classroom with teacher and learners present together:	Yes 1 No 2	1.8±.41	2.0	1.0

Appendix G

One-on-One Review results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Technical	1. The needed technology is not accessible to me.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.83±1.83	5	1
Technical	2. I am afraid of losing privacy, confidentiality, or intellectual property in the elearning environment.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.00±1.26	4	1
Technical	3. I am unfamiliar with the technical tools needed in elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.17±1.17	4	1
Technical	4. I lack a reliable internet connection, high speed connectivity, or an internet service provider.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.83±1.17	4	1
Technical	5. The hardware, software, repairs, or a service provider costs too much.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.83±1.17	4	1
Technical	6. I lack the skills necessary to navigate successfully through the delivery system in the elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.50±1.52	5	1
Technical	7. I am afraid of computers and related technologies.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.50±1.22	4	1

Appendix G

One-on-One Review results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Technical	8. I am concerned about, or have found a lack of consistency in platforms, hardware, browsers, and software for courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±.75	3	1
Technical	9. I lack the necessary skills in using the software for elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.33±1.03	4	1
Technical	10. I am concerned about, or have a lack of technical assistance.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.33±.82	3	1
Technical	11. I am uncomfortable with, or fear, learning how to use new tools to access elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.33±.82	3	1
Technical	12. I am uncomfortable with, or fear, learning with different methods used in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.00±.00	1	1
Technical	13. I am concerned, or have found that a lack of compatibility of hardware and software creates technical problems.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.50±1.05	4	1
Total Technical			2.15±1.06	5	1

Appendix G

One-on-One Review results of Participant Barriers to Elearning Survey

Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Infrastructure / Support	14. I am concerned about, or have found a lack of access to the instructor, or knowledgeable experts.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.33±.82	3	1
Infrastructure / Support	15. I am concerned about, or have found a lack of timely feedback or response from the instructor.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.00±.63	3	1
Infrastructure / Support	16. I have found or am concerned that the quality of the learning materials and instruction is lower in courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±1.33	4	1
Infrastructure / Support	17. I have found or am concerned that instructors don't know what they are doing when they design or teach via elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.17±1.47	4	1
Infrastructure / Support	18. I am concerned about, or have found a lack of clear expectations or instructions from elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.00±1.10	4	1

Appendix G

One-on-One Review results of Participant Barriers to Elearning Survey

Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Infrastructure/ Support	19. There is insufficient training given in the use of the delivery system.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.00±1.26	4	1
Infrastructure/ Support	20. I am concerned about, or have found a lack of support and services.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.67±1.63	5	1
Infrastructure/ Support	21. I am concerned about, or have found that course materials are not delivered on time.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.17±1.17	4	1
Infrastructure/ Support	22. I have difficulty contacting administrative staff for elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.33±1.03	4	1
Infrastructure/ Support	23. Concern that I might be wasting my time if the courses or programs I take, or consider taking, lack accreditation.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.17±1.33	4	1
Total			2.17±1.18	4	1

Appendix G

One-on-One Review results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Social	24. Elearning is, or seems like it would be impersonal to me.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.17±1.1	4	1
Social	25. I prefer to learn through face-to-face interaction with other students and instructor.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±1.3	4	1
Social	26. I do , or I am afraid of feeling isolated from the other students in an elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.67±1.2	4	1

Appendix G

One-on-One Review results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Social	27. I am concerned about, or have found a lack of interaction and communication among students in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.00±.63	3	1
Social	28. I am concerned about, or have found a lack of social context cues (e.g., body language) in the elearning environment.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±.98	3	1
Social	29. I am concerned about, or have found a lack of collaboration with other students in elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.67±.52	2	1
Total Social			1.86±.97	4	1

Appendix G

One-on-One Review results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Prerequisite Skills	30. I lack the writing skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.17±.41	2	1
Prerequisite Skills	31. I lack the typing skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.67±1.0	3	1
Prerequisite Skills	32. I lack the reading skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.00±0.0	1	1
Prerequisite Skills	33. I lack the language skills needed in online courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.50±.84	3	1
Prerequisite Skills	34. I lack the technical skills needed in online courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±.98	3	1
Total Prerequisite			1.43±.65	3	1

Appendix G

One-on-One Review results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 6				
Motivation	35. I have to take on more of the responsibility for my own learning in an elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.00±1.26	4	1
Motivation	36. I lack the motivation to learn through elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±.98	3	1
Motivation	37. I procrastinate, or feel I cannot seem to "get started to learn" in elearning programs.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±.98	3	1
Motivation	38. I choose to learn the easier aspects of the assignments rather than the more demanding ones.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.17±1.17	4	1
Motivation	39. I have found or am concerned that the elearning environment is not inherently motivating.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.33±.82	3	1
Total Motiv.			2.03±1.0	4	1

Appendix G

One-on-One Review results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
Time/ Interruptions	40. I am concerned about, or have found there is not sufficient time to learn during elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.83±.75	3	1
Time/ Interruptions	41. There are significant interruptions at work, home or wherever I study.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.67±.82	4	1
Time/ Interruptions	42. I am concerned about, or have found a lack of support from family, friends, employers, or significant others.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.17±1.1	4	1
Time/ Interruptions	43. I am afraid my family life will be disrupted.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.50±.84	3	1
Time/ Interruptions	44. Elearning would or does cut in to my personal time.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.50±1.0	4	1
Total Time/ Interruption			2.13±.92	4	1

Appendix G

One-on-One Review elearning barriers demographics and survey results with bivariate correlation analysis with user interface ratings

	Comfort with Elearning	Elearning Effectiveness	Enjoy Elearning	Courses Completed	Courses Dropped	Likelihood of Taking Elearning Course	Barriers to Traditional Class
	1=Lowest 4=Highest	1-3 = Most Effective/ Experienced 4-6 = Least Effective/ No Experience	1-3 = Most Effective/ Experienced 4-6=Least Effective/ No Experience	2=One elearning course	1=Zero elearning course	1=Lowest 4=Highest	Yes =1 No =2
Barriers to Elearning Demographics	3.0±1.26	3.5±1.87	3.5±1.51	2.1±.75	1.0±.63	2.6±0.52	1.8±0.41

Survey Categories	Technical	Infrastructure/ Support Systems	Social	Prerequisite Skills	Motivation	Time/ Interruptions	Overall
	No Barrier 1 2 3 4 5 Very Strong	No Barrier 1 2 3 4 5 Very Strong	No Barrier 1 2 3 4 5 Very Strong	No Barrier 1 2 3 4 5 Very Strong	No Barrier 1 2 3 4 5 Very Strong	No Barrier 1 2 3 4 5 Very Strong	No Barrier 1 2 3 4 5 Very Strong
Barriers Survey Results	2.15±1.06	2.17±1.18	1.86±.97	1.43±.65	2.03±1.04	2.13±.92	2.02±.45
Pierson Correlation Usability and Barriers	-0.841 p = .036 two-tail	-0.400 p = .432 two-tail	-0.801 p = .056 two-tail	-0.720 p = .107 two-tail	-0.204 p = .698 two-tail	-0.757 p = .081 two-tail	-0.745 p = .089 two-tail

Appendix G

Field Trial 1 results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Demographic	5. I have dropped the following number of distance education courses, even if I later completed one or more of these courses:	0 1 2 3 4 5-7 8-10 11-13 14 or more	1.0±.00	1.0	1.0
Demographic	6. The likelihood that I will take an elearning course in the future if I am not required to so is:	Definitely not 1 2 3 4 Definitely yes	2.7±.73	4.0	2.0
Demographic	7. My cultural background , physical or other disability, or some prejudice of instructors or peers concerning a personal characteristic of mine significantly affects my learning in the traditional, bricks-and-mortar classroom with teacher and learners present together:	Yes 1 No 2	1.9±.27	2.0	1.0

Appendix G

Field Trial 1 results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Technical	1. The needed technology is not accessible to me.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.21±1.89	3	1
Technical	2. I am afraid of losing privacy, confidentiality, or intellectual property in the elearning environment.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±1.26	4	1
Technical	3. I am unfamiliar with the technical tools needed in elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±1.27	5	1
Technical	4. I lack a reliable internet connection, high speed connectivity, or an internet service provider.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.0±1.5	5	1
Technical	5. The hardware, software, repairs, or a service provider costs too much.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±1.07	4	1
Technical	6. I lack the skills necessary to navigate successfully through the delivery system in the elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±.91	4	1
Technical	7. I am afraid of computers and related technologies.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.28±.47	2	1

Appendix G

Field Trial 1 results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Technical	8. I am concerned about, or have found a lack of consistency in platforms, hardware, browsers, and software for courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.84±.69	3	1
Technical	9. I lack the necessary skills in using the software for elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±.92	4	1
Technical	10. I am concerned about, or have a lack of technical assistance.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±1.17	5	1
Technical	11. I am uncomfortable with, or fear, learning how to use new tools to access elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.35±.74	3	1
Technical	12. I am uncomfortable with, or fear, learning with different methods used in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±1.07	4	1
Technical	13. I am concerned, or have found that a lack of compatibility of hardware and software creates technical problems.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±.99	4	1
Total Technical			1.89±.89	5	1

Appendix G

Field Trial 1 results of Participant Barriers to Elearning Survey

Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Infrastructure / Support	14. I am concerned about, or have found a lack of access to the instructor, or knowledgeable experts.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.35±1.21	4	1
Infrastructure / Support	15. I am concerned about, or have found a lack of timely feedback or response from the instructor.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.14±1.03	4	1
Infrastructure / Support	16. I have found or am concerned that the quality of the learning materials and instruction is lower in courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.93	4	1
Infrastructure / Support	17. I have found or am concerned that instructors don't know what they are doing when they design or teach via elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.93	3	1
Infrastructure / Support	18. I am concerned about, or have found a lack of clear expectations or instructions from elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±.77	3	1

Appendix G

Field Trial 1 results of Participant Barriers to Elearning Survey

Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Infrastructure/ Support	19. There is insufficient training given in the use of the delivery system.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.57±.75	3	1
Infrastructure/ Support	20. I am concerned about, or have found a lack of support and services.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.93	4	1
Infrastructure/ Support	21. I am concerned about, or have found that course materials are not delivered on time.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.84	3	1
Infrastructure/ Support	22. I have difficulty contacting administrative staff for elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±1.01	4	1
Infrastructure/ Support	23. Concern that I might be wasting my time if the courses or programs I take, or consider taking, lack accreditation.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.64±1.01	4	1
Total			1.87±.96	4	1

Appendix G

Field Trial 1 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Social	24. Elearning is, or seems like it would be impersonal to me.	No Barrier 1 2 3 4 5 Very Strong Barrier	3.07±1.3	5	1
Social	25. I prefer to learn through face-to-face interaction with other students and instructor.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.43±1.5	5	1
Social	26. I do , or I am afraid of feeling isolated from the other students in an elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.78±1.4	5	1

Appendix G

Field Trial 1 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Social	27. I am concerned about, or have found a lack of interaction and communication among students in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.36±1.1	4	1
Social	28. I am concerned about, or have found a lack of social context cues (e.g., body language) in the elearning environment.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.86±1.3	5	1
Social	29. I am concerned about, or have found a lack of collaboration with other students in elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.35±1.4	5	1
Total Social			2.64±1.3	4	1

Appendix G

Field Trial 1 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Prerequisite Skills	30. I lack the writing skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.5±.76	3	1
Prerequisite Skills	31. I lack the typing skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.36±.93	4	1
Prerequisite Skills	32. I lack the reading skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.14±.53	3	1
Prerequisite Skills	33. I lack the language skills needed in online courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.35±.63	3	1
Prerequisite Skills	34. I lack the technical skills needed in online courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.78±.97	4	1
Total Prerequisite			1.42±.77	4	1

Appendix G

Field Trial 1 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Motivation	35. I have to take on more of the responsibility for my own learning in an elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±.95	4	1
Motivation	36. I lack the motivation to learn through elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.14±.95	4	1
Motivation	37. I procrastinate, or feel I cannot seem to "get started to learn" in elearning programs.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.0±.96	3	1
Motivation	38. I choose to learn the easier aspects of the assignments rather than the more demanding ones.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±.91	5	1
Motivation	39. I have found or am concerned that the elearning environment is not inherently motivating.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.28±1.2	4	1
Total Motiv.			2.00±.99	5	1

Appendix G

Field Trial 1 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n = 14				
Time/ Interruptions	40. I am concerned about, or have found there is not sufficient time to learn during elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.43±.94	4	1
Time/ Interruptions	41. There are significant interruptions at work, home or wherever I study.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.71±1.1	4	1
Time/ Interruptions	42. I am concerned about, or have found a lack of support from family, friends, employers, or significant others.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±.91	4	1
Time/ Interruptions	43. I am afraid my family life will be disrupted.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±1.2	4	1
Time/ Interruptions	44. Elearning would or does cut in to my personal time.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.40±.74	4	1
Total Time/ Interruption			2.21±.97	4	1

Appendix G

Field Trial 2 results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Demographic	1. I would characterize myself regarding online learning most closely as:	Do not use technology 1 2 3 4 Comfortable and confident w/ technology	2.8±1.05	4.0	1.0
Demographic	2. The statement that best describes how I view my learning effectiveness in elearning is:	Cannot learn by computer 1 2 3 4 5 6 Learn Better by computer	2.5±1.4	4.0	1.0
Demographic	3. The statement that best describes how I view my enjoyment of elearning compared to being in the same room as the instructor and other learners is:	Enjoy elearning experience significantly less 1 2 3 4 5 6 Enjoy more	1.6±1.51	6.0	1.0
Demographic	4. I have completed the following number of distance education courses.	0 1 2 3 4 5-7 8-10 11-13 14 or more	2.6±2.4	9.0	1.0

Appendix G

Field Trial 2 results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Demographic	5. I have dropped the following number of distance education courses, even if I later completed one or more of these courses:	0 1 2 3 4 5-7 8-10 11-13 14 or more	1.0±.00	1.0	1.0
Demographic	6. The likelihood that I will take an elearning course in the future if I am not required to so is:	Definitely not 1 2 3 4 Definitely yes	2.7±.73	4.0	2.0
Demographic	7. My cultural background , physical or other disability, or some prejudice of instructors or peers concerning a personal characteristic of mine significantly affects my learning in the traditional, bricks-and-mortar classroom with teacher and learners present together:	Yes 1 No 2	1.9±.27	2.0	1.0

Appendix G

Field Trial 2 results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Technical	1. The needed technology is not accessible to me.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.21±1.89	3	1
Technical	2. I am afraid of losing privacy, confidentiality, or intellectual property in the elearning environment.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±1.26	4	1
Technical	3. I am unfamiliar with the technical tools needed in elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±1.27	5	1
Technical	4. I lack a reliable internet connection, high speed connectivity, or an internet service provider.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.0±1.5	5	1
Technical	5. The hardware, software, repairs, or a service provider costs too much.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±1.07	4	1
Technical	6. I lack the skills necessary to navigate successfully through the delivery system in the elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±.91	4	1
Technical	7. I am afraid of computers and related technologies.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.28±.47	2	1

Appendix G

Field Trial 2 results of Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Technical	8. I am concerned about, or have found a lack of consistency in platforms, hardware, browsers, and software for courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.84±.69	3	1
Technical	9. I lack the necessary skills in using the software for elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±.92	4	1
Technical	10. I am concerned about, or have a lack of technical assistance.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±1.17	5	1
Technical	11. I am uncomfortable with, or fear, learning how to use new tools to access elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.35±.74	3	1
Technical	12. I am uncomfortable with, or fear, learning with different methods used in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±1.07	4	1
Technical	13. I am concerned, or have found that a lack of compatibility of hardware and software creates technical problems.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.93±.99	4	1
Total Technical			1.89±.89	5	1

Appendix G

Field Trial 2 results of Participant Barriers to Elearning Survey

Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Infrastructure / Support	14. I am concerned about, or have found a lack of access to the instructor, or knowledgeable experts.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.35±1.21	4	1
Infrastructure / Support	15. I am concerned about, or have found a lack of timely feedback or response from the instructor.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.14±1.03	4	1
Infrastructure / Support	16. I have found or am concerned that the quality of the learning materials and instruction is lower in courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.93	4	1
Infrastructure / Support	17. I have found or am concerned that instructors don't know what they are doing when they design or teach via elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.93	3	1
Infrastructure / Support	18. I am concerned about, or have found a lack of clear expectations or instructions from elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±.77	3	1

Appendix G

Field Trial 2 results of Participant Barriers to Elearning Survey

Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Infrastructure/ Support	19. There is insufficient training given in the use of the delivery system.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.57±.75	3	1
Infrastructure/ Support	20. I am concerned about, or have found a lack of support and services.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.93	4	1
Infrastructure/ Support	21. I am concerned about, or have found that course materials are not delivered on time.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±.84	3	1
Infrastructure/ Support	22. I have difficulty contacting administrative staff for elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.64±1.01	4	1
Infrastructure/ Support	23. Concern that I might be wasting my time if the courses or programs I take, or consider taking, lack accreditation.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.64±1.01	4	1
Total			1.87±.96	4	1

Appendix G

Field Trial 2 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Social	24. Elearning is, or seems like it would be impersonal to me.	No Barrier 1 2 3 4 5 Very Strong Barrier	3.07±1.3	5	1
Social	25. I prefer to learn through face-to-face interaction with other students and instructor.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.43±1.5	5	1
Social	26. I do , or I am afraid of feeling isolated from the other students in an elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.78±1.4	5	1

Appendix G

Field Trial 2 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Social	27. I am concerned about, or have found a lack of interaction and communication among students in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.36±1.1	4	1
Social	28. I am concerned about, or have found a lack of social context cues (e.g., body language) in the elearning environment.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.86±1.3	5	1
Social	29. I am concerned about, or have found a lack of collaboration with other students in elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.35±1.4	5	1
Total Social			2.64±1.3	4	1

Appendix G

Field Trial 2 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Prerequisite Skills	30. I lack the writing skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.5±.76	3	1
Prerequisite Skills	31. I lack the typing skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.36±.93	4	1
Prerequisite Skills	32. I lack the reading skills needed in elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.14±.53	3	1
Prerequisite Skills	33. I lack the language skills needed in online courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.35±.63	3	1
Prerequisite Skills	34. I lack the technical skills needed in online courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.78±.97	4	1
Total Prerequisite			1.42±.77	4	1

Appendix G

Field Trial 2 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Motivation	35. I have to take on more of the responsibility for my own learning in an elearning course.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±.95	4	1
Motivation	36. I lack the motivation to learn through elearning.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.14±.95	4	1
Motivation	37. I procrastinate, or feel I cannot seem to "get started to learn" in elearning programs.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.0±.96	3	1
Motivation	38. I choose to learn the easier aspects of the assignments rather than the more demanding ones.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±.91	5	1
Motivation	39. I have found or am concerned that the elearning environment is not inherently motivating.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.28±1.2	4	1
Total Motiv.			2.00±.99	5	1

Appendix G

Field Trial 2 results from Participant Barriers to Elearning Survey

Elearning Category	Question Item	Scale	M ± SD	Max.	Min.
	n =				
Time/ Interruptions	40. I am concerned about, or have found there is not sufficient time to learn during elearning courses.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.43±.94	4	1
Time/ Interruptions	41. There are significant interruptions at work, home or wherever I study.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.71±1.1	4	1
Time/ Interruptions	42. I am concerned about, or have found a lack of support from family, friends, employers, or significant others.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.71±.91	4	1
Time/ Interruptions	43. I am afraid my family life will be disrupted.	No Barrier 1 2 3 4 5 Very Strong Barrier	1.85±1.2	4	1
Time/ Interruptions	44. Elearning would or does cut in to my personal time.	No Barrier 1 2 3 4 5 Very Strong Barrier	2.40±.74	4	1
Total Time/ Interruption			2.21±.97	4	1

User Interface Rating Form

The "User Interface" of an interactive instructional product, e.g, a multimedia program, is a critical element of the product that must be carefully evaluated. If the user interface is not well-designed, learners will have little opportunity to learn from the program. This rating form includes ten major criteria for assessing the user interface for an interactive program, such as "ease of use" and "screen design."

User Interface Rating Tool for Interactive Multimedia

Adapted from (Reeves & Harmon, 2003)

Instructions: For each of ten user interface dimensions illustrated below, rate the program you have reviewed on a one to ten scale by circling the appropriate number under the dimension. Please add any comments that may help to clarify or explain your rating. You are provided three additional black evaluation boxes, in which you can add your own attribute and scale.

1. Ease of use.

Difficult Easy

1 2 3 4 5 6 7 8 9 10

Comments:

2. Navigation

Difficult Easy

1	2	3	4	5	6	7	8	9	10

Comments:

3. Challenging Content

Unmanageable Manageable

1	2	3	4	5	6	7	8	9	10

Comments:

4. Logical Mapping of Progress

None Powerful

1	2	3	4	5	6	7	8	9	10

Comments:

5. Screen Design

Non-functional Functional

1 2 3 4 5 6 7 8 9 10

Comments:

6. Content Knowledge

Very Unknowledgeable Very Knowledgeable

1 2 3 4 5 6 7 8 9 10

Comments:

7. Information Presentation

Unclear Clear

1 2 3 4 5 6 7 8 9 10

Comments:

8. Use of Media

Uncoordinated Coordinated

1 2 3 4 5 6 7 8 9 10

Comments:

9. Aesthetics, or the Look of the Program

Unpleasing Pleasing

1 2 3 4 5 6 7 8 9 10

Comments:

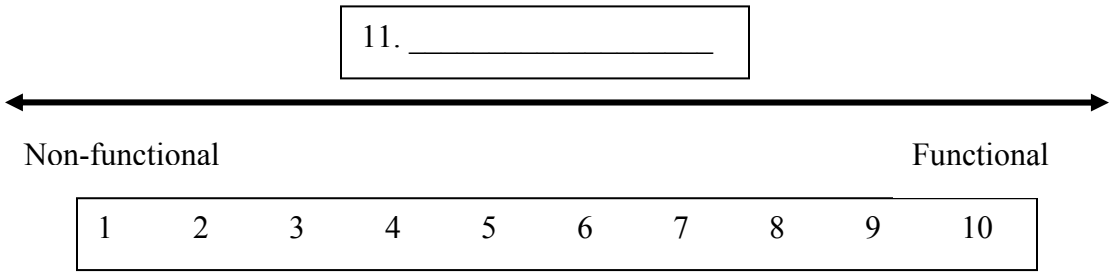
10. Overall Functionality

Non-functional Functional

1 2 3 4 5 6 7 8 9 10

Comments:

Please add other comments related to the user interface of this program below:



Comments:

12. _____

Non-functional Functional

1 2 3 4 5 6 7 8 9 10

Comments:

13. _____

Non-functional Functional

1 2 3 4 5 6 7 8 9 10

Comments: