

INTERACTIONS IN THE REAL WORLD

A SURVEY OF INTERACTIONS IN GOVERNMENT/MILITARY,
HIGHER EDUCATION AND CORPORATE DISTANCE EDUCATION

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May 2, 2002

Prepared for:

Indiana University, Instructional Systems Technology
R685 – Instructional Strategies for Distance Education
Spring Semester 2002

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Introduction

Is there a key to successful distance education? Four hundred years ago John Donne wrote, "No man is an island, entire of itself; every man is a piece of the Continent, a part of the main." These words remain relevant even today, especially in the realm of education. We do not learn in isolation, but rather through interactions with our environment. Whether it is by grappling with a difficult math problem, talking with a professor, or problem solving with co-workers, we learn through our interactions with our world. Indeed, according to many educators, interaction is key to effective learning and information exchange (Keegan, 1990). Research indicates that higher levels of interaction have been associated with improved achievement (Gokhale, 1995) and positive learning attitudes (Althaus, 1997; Fulford & Zhang, 1993; Garrison, 1990; Hackman & Walker, 1990; Kearsley, 1995).

The value of interaction is even more evident in a distance-learning environment. Separated by time, geography, and culture, it is easy for distance students to feel like isolated, solitary learners. Interaction creates a network of bridges that connect these island learners to a "part of the main." Many authors on the subject of distance learning argue that interaction is the most important instructional element in distance education (Moore, 1989; Kearsley, 1995).

If interaction is such a critical ingredient to distance learning, how is such interaction defined among education researchers? How is it manifested in distance learning? This paper will attempt to answer these questions. Focusing on online learning environments, we will first discuss research defining the various types and benefits of interaction. Second, drawing from a convenience sample, we will identify a variety of interactions that have been

designed into distance courses used in the government and military, higher education, and corporate sectors. Without assessing the actual quality or quantity of interactions, we will attempt to measure the degree to which interactions are planned for in each course for instructional purposes. Finally, we will identify which interactions appear to be shared in all three sectors and address the significance of our findings.

Background

Definition of Distance Education

In order to identify the types of interactions used in distance education, it is important to understand how we define both concepts. Many authors have written and analyzed definitions of the term distance education. After reviewing the numerous versions summarized in the professional literature (Keegan, 1990; Simonson, Smaldino, Albright & Zvacek, 2000), we agreed to use Keegan's 1990 definition of distance education to set the research parameters for this project. We selected Keegan's explanation for its comprehensiveness and scholarly origins. Distance education is:

1. The quasi-permanent separation of teacher and learner throughout the length of the learning process (this distinguishes it from conventional face-to-face education).
2. The influence of an educational organization in both the planning and preparation of learning materials and in the provision of student support services (this distinguishes it from private-study and teach-yourself programs).
3. The use of technical media – print, audio, video or computer – to unite teacher and learner and carry the content of the course.
4. The provision of two-way communication so that the student may benefit from or even initiate dialogue (this distinguishes it from other uses of technology in education).
5. The quasi-permanent absence of the learning group throughout the length of the learning process so that people are usually taught as

individuals and not in groups with the possibility of occasional meetings for both didactic and socialization purposes (Keegan, 1990, p. 44).

Although we selected Keegan's definition to set the general parameters for this project, we expanded the definition in the area of corporate DE. The reasons for this will be discussed in the section of this report dedicated to the corporate sector.

Definition of Interaction

In the literature regarding interaction in distance education, there have been many articles debating the definition of the term (Livengood, 1987; Wagner, 1994; Sutton 2000). Hirumi (2001) writes that a brief review of distance education literature revealed that "interactivity is one of the most frequently discussed topics among distance educators" (p. 3). Wagner (1989) has also written about the distinction between *interaction* and *interactivity*, asserting that interaction is a feature of instruction while interactivity is a feature of instructional delivery systems.

For this project, we accepted Wagner's assertion, "interactions are reciprocal events that require at least two objects and two actions. Interactions occur when these objects and events mutually influence one another" (Wagner, 1994, p. 8). Wagner's definition emphasizes that reciprocity and mutual influence are two defining qualities of interactions. Her definition includes learner interactions with instructors and other learners but would technically exclude learner-content interaction as a form of interaction. (See Learner-Content below for more details.)

Types of Interaction

There is a significant amount of literature documenting the various forms of interaction and their instructional benefits. The following section summarizes many of the interactions discussed in the educational literature and identifies the interactions we perceive as meeting Wagner's definition of instructional interaction.

Learner-Content Interaction

Moore (1989) describes learner-content interaction as one of three interactions that occur in distance education. He defines learner-content interaction as the interaction between the learner and subject matter being studied that results in changes in the learner's understanding or cognitive structures.

Pedagogical Support

Any learning situation consists of a learner and some form of content or information. As a result, there is no need to describe pedagogical support for the concept of learners and content being important elements of learning situations. Instead, the question at hand is the pedagogical acceptance of the concept of learner-content as a form of interaction. Learner-content interaction, as described by Moore, has been widely accepted and referred to by a number of authors. Fulford and Zhang (1993) refer to Moore's framework in their research regarding learner perceptions of interaction, although their actual research focus was on learner-instructor and learner-learner interactions. Hillman, Willis, and Gunawardena (1994) tacitly demonstrate acceptance of learner-content interaction when they assert that Moore's three types of interaction need to be augmented by the inclusion of learner-interface action.

Soo and Bonk (1998) also demonstrate acceptance of this concept during research in which they ask distance education instructors to rank the importance of learner-content interaction in online education.

However, in the context of Wagner's definition of interaction, learner-content is technically not an interaction. Sutton (2000) writes, "Content and a computer interface are inanimate, they are not 'actors,' and therefore cannot literally interact with human learners" (p. 7). According to Wagner's definition of interaction, learner-content fails to create any sort of reciprocal event where the learner acts upon the content and the content acts back. It also does not include mutual influence because the content does not alter itself because of the learner's interaction. M. H. Molenda has made a distinction between *interaction* and *involvement*, suggesting that *involvement* provides a more accurate description of the relationship between learners and content (personal communication, February 21, 2002). We accept this distinction and therefore will not address learner-content as an interaction in this study.

Learner-Instructor Interaction

Moore (1989) describes learner-instructor interaction as "interaction between the learner and the expert who prepared the subject material, or some other expert acting as instructor" (p. 2). Soo & Bonk (1998) apply Moore's notion of learner-instructor interaction and refer to it as "the assistance, counsel, organization, stimulation and support that the instructor provides to the learner in helping the latter construct new understanding of the content" (p. 3). The instructor also assumes the role of knowledge expert (Soo & Bonk, 1998).

Pedagogical Support

Regarding the importance of learner-instructor interaction in a classroom learning environment, Bloom (1981) emphasizes this type of interaction as a major element in explaining “the cognitive learning of students, their interest in school subjects and learning, and their confidence in their own capabilities” (p.). Learner-instructor interaction is also regarded as essential to support learners’ cognitive development in distance education courses (Moore, 1989). In fact, the opportunity for interactions with the instructor helps overcome the limitations imposed by the physical separation of the distance education instructor and learner.

Recalling Keegan’s definition of distance education, one of the attributes of distance education is the influence an institution plays in the planning and preparation of learning material. Often in distance education, the people who interact with learners may not be the same ones who prepare, design, and present the content information (Moore & Kearsley, 1997). Although this may not be true of all institutions, especially those in higher education, the subject matter in distance education is frequently designed, developed, and implemented by multiple people. This structure enables the online instructor to specialize in active implementation. In turn, the instructor’s activities and energy are more focused on facilitating learning because distance education is more a learner-centered system (Beaudoin, 1990). Other researchers comment that a distance teacher becomes a facilitator whose main job is organizing learners’ interactions with content and with other learners through counsel, support, assistance, and supervision (Berge, 1995; Moore, 1989; Soo & Bonk 1998). Furthermore, Berge (1995) categorizes the role of the successful online instructor/facilitator

into four types: pedagogical, social, managerial, and technical. According to Berge, pedagogical roles such as online discussion moderator/tutor are the most important roles of an online facilitator.

Although the role of an online instructor is changing from conventional *knowledge imparter* to facilitator/moderator, the importance of meaningful interaction has not changed (White & Bridwell, 1998, p.394).

Questions to address

In this study, we hope to find what types of learner-instructor interaction are evident in distance education courses.

Learner-Learner Interaction

Recently, learner-learner interaction in conventional and distance learning environments has been the topic of much discourse. Moore and Kearsley (1997) focus attention on learner-learner interaction, calling it a “new dimension of distance education” (p. 4). Moore defines learner-learner interaction as the exchange that occurs “between one learner and other learners, alone or in group settings, with or without the real-time presence of an instructor” (Moore, 1989, p. 4). Thus, learner-learner interaction can consist of one-on-one or one-with-many exchanges, depending on the context. Rarely does the literature use the exact phrase “learner-learner” interaction. Instead, current and prior learning theories refer to such interaction using a variety of terms such as collaborative learning, cooperative learning, group learning, and situated learning. These theories are, however, heavily steeped in learner-learner interaction and its critical role in the cognitive development process.

Pedagogical Support

In 1962, Russian philosopher Lev Semyonovich Vygotsky brought the importance of learner-learner interaction to the forefront of American educational discourse when his work, *Mind in Society*, was first published. Vygotsky (1978) claimed that cognitive development occurs through social interactions. That is, what an individual comes to know is determined by the culture and social interaction that the individual is exposed to.

Regarding his social development theory, Vygotsky (1978) wrote:

Every function in the child's cultural development appears twice: First, on the social level, and later, on the individual level; first between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to local memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals (p. 57).

Vygotsky contends that the transfer of inter-personal cognitive process to intra-personal process occurs over a "long series of developmental events" (p. 57). While interaction with adults is important, it is not enough. Learning "awakens...when the child is interacting with people in his environment and in cooperation with his peers" (p. 90). Learning takes place, not in isolation, but through interactions with peers. Learning is by its very nature an interactive, social event (Vygotsky, 1978).

Many educators believe that formal education practices should support socially interactive learning environments. Nelson (1999) argues that learning environments should support and increase these "naturally effective collaborative processes" (p. 245) which learners develop through life experience. Alternatively, if instructors impose artificial learning structures in the form of learning environments that do not incorporate learner-

learner interactions, they can “hinder the flow of interaction and learning and curtail effective, efficient problem solving” (Nelson, 1999, p. 245).

Learner-learner interaction provides a means for ideas to be expressed, challenged, changed, adopted, and discarded. According to Savery and Duffy (1995), knowledge advances through social negotiation and assessing the viability of one’s own understanding. “Collaborative groups are important because we can test our own understanding and examine the understanding of others as a mechanism for enriching, interweaving, and expanding our understanding of particular issues or phenomena” (Savery & Duffy, 1995, p. 32). Other people are the “greatest source of alternative views to challenge our current views and hence to serve as the source of puzzlement that stimulates new learning” (Savery & Duffy, 1995, p. 32). Ideas develop when ideas are challenged (Brown, Collins & Duguid, 1989). Collaborative peer interactions create such a medium for exposure, discussion, and debate that can ultimately lead students to alter their cognitive schemas.

Learner-learner interaction through collaborative and cooperative learning represents the real world environment, more so than individual learning (Brown et al, 1989; Beer, 2000). Predominantly, the skills and knowledge acquired and applied in the workplace setting are no longer done in isolation, but rather in teams. Within collaborative learning environments, learners develop critical interpersonal skills, such as negotiation and cooperation, which are later exhibited in workplace settings (Brown et al, 1989).

Chickering and Gamson (1987), in conjunction with the American Association for Higher Education, conducted an extensive pedagogical study identifying seven fundamental principles to effective undergraduate teaching. Echoing the words of many

researchers and educators, they stated the importance of learner-learner interaction in a simple but powerful manner:

Learning is enhanced when it is more like a team effort than a solo race. Good learning, like good work, is collaborative and social, not competitive and isolated. Working with others often increases involvement in learning. Sharing one's own ideas and responding to others' reactions sharpens thinking and deepens understanding. (¶ 9)

Learning does not occur in isolation, but through interactions with our peers. Such interactions replicate our natural learning process, affecting the construction of knowledge, the development of critical skills for our work environment, and the enhancement of critical thinking skills.

Questions to address

In addition to identifying if learner-learner interaction is designed into distance courses, we hope to learn how the design of online learning environments enables and enhances learner-learner interaction.

Learner-Self Interaction

For the purposes of this study we adopted Soo and Bonk's (1998) definition of learner-self interaction: "...the learner's reflection on the content, learning process, and his new understanding" (p. 3). Their treatment of the concept revolves around the learner's reflections on the instructional content and the process by which the learner comes to understand the content. Numerous researchers and scholars have also commented on the idea of reflection as a tool to promote self-directed, self-regulated and independent thinking (Soo & Bonk, 1998; Wagner, 1997; Ertmer & Newby, 1996). Dewey (1933) considered reflective thinking as "the kind of thinking that consists in turning a subject over in the mind

and giving it serious and consecutive consideration” (p. 3). Dewey considered reflective thought to be predicated upon some state of confusion, doubt or difficulty that causes an individual to inquire, study and develop a solution.

Pedagogical Support

Ertmer and Newby (1996) describe reflection as a required attribute of *expert learners* – individuals who “display planfulness, control, and reflection; they are aware of the knowledge and skills they possess, or are lacking, and use appropriate strategies to actively implement or acquire them” (p. 1). Their schema describes reflection as the link between how expert learners translate metacognition (what they *know* about learning) into self-regulation (what they *do* about learning). Paris and Winograd (1990) cite metacognition as an important factor in the quality of student learning, which results in a greater awareness of their own thinking practices as they go through school. Paris and Winograd further develop two aspects of metacognition: self-appraisal and self-management. These traits in learners help them “become active participants in their own performance rather than the passive recipients of instruction and imposed experiences” (p. 18). Wagner (1997) defines interactions to support learner control/self-regulation as the “ability of a learner to stay on task, to mediate the need for additional information to complete one’s understanding and to recognize when the learning task has been completed” (p. 23).

As a more concrete example, Ertmer and Newby (1996) describe a scenario involving two high school students preparing for an exam. The exam will cover unfamiliar material and will be presented in a format that neither student considers to be their strength (essay writing, for example). With her new task in mind, the expert (reflective) learner considers

her strengths and weaknesses as she prepares to study and formulates a succinct plan which factors in her study habits, time constraints, and previous learning experiences. The other student prepares for the test by following her standard study plan, not considering that she might need to prepare for the test any differently. After the test, Ertmer and Newby suggest that the expert learner will compare the test results with her preparation scheme, and make adjustments the next time to improve her performance, thus increasing in her metacognitive knowledge. The next time the expert learner encounters a test, those metacognitive stores will be transformed into self-regulated study by the process of reflection (Ertmer and Newby, 1996). The student who did not adjust her preparation for the test will not likely reflect on the test studying process. In turn, she will not make adjustments for improvement the next time she encounters a similar challenge.

In congruence with what Dewey (1933) suggested about reflective thought coming about as a result of confusion or doubt, Ertmer and Newby (1996) attest that “metacognitive knowledge provides learners with the personal insights needed to regulate their learning process in relationship to changing task demands” (p. 6).

Schon (1987) defines reflection dually as reflection-in-action, thinking that occurs during an activity and impacts the course of that activity (considers the past and predicts the immediate future), and reflection-on-action, thinking that taps past experiences to further understanding and execution of future activities. Reflection-in-action would appear to fit Ertmer and Newby’s expert learner as she adjusted her study practices while studying if they were not working satisfactorily, and reflection-on-action seems to fit the expert

learner as she looks back on the entire process after the test and evaluates and plans for the next test.

The American Psychological Association's Board of Educational Affairs (BEA) (1997) published fourteen principles for school redesign and reforms, including several that incorporate metacognitive and cognitive factors. Principle four, *Strategic Thinking*, and principle five, *Thinking about Thinking*, suggest that the student should reflect on methods and strategies to improve learning and personal performance. The BEA (1997) supports Ertmer and Newby's (1996) concept of the expert learner by suggesting that successful learners reflect on their thinking, set goals, monitor their progress, and respond appropriately if they find themselves falling short of their own expectations.

In reference to our earlier definition of interaction as a reciprocal event, several authors have defined reflection as an inner dialogue with oneself, or with a problematic situation (Soo & Bonk, 1998; Grimmet, 1988). That dialogue serves as a learning event to draw out new ideas and solutions from past experiences and learning situations.

What is the instructor's role in facilitating reflective thought, and thus, learner-self interaction? Ertmer and Newby (1996) assert that a major role of schools is to create students who "know how to learn" (p. 22). The BEA (1997) infers that classrooms using instructional methods that facilitate learners' development of metacognitive strategies stand to enhance both students' learning and students' sense of responsibility for their own learning. Soo and Bonk (1998) comment that "educators need to focus on learning strategies that would foster critical reflection to improve higher level thinking among learners" (p. 7). Kilbourn (1988) suggests that teachers themselves should practice Schon's reflection-on-action, as they are

often isolated from fellow practitioners and do not benefit from peer observation and feedback. So too might distance education students benefit even more than traditional students since they typically do not have the luxury of immediate instructor or peer feedback.

Questions to address

Through this study we hope to find if designers plan for learner-self interaction as evidenced by activities within the actual course work demanded of students. Examples we expect to find include reflection writing assignments and journal requirements. Alternative terminology, such as reflection, metacognition, and self-regulation will also be treated as within this category of interaction.

Learner-Interface Interaction

Hillman, Willis and Gunawardena (1994) propose an additional interaction that occurs between the learner and the interface used to facilitate communication with the content, the instructor, and other learners. The learners' ability to access the information, and all other elements of a distance education course, is largely predicated by their knowledge and aptitude at using the interface presented by the course. Examples of interfaces include online learning environments, satellite video conferencing tools, net conferencing tools, etc.

Hillman et al. (1994) define and explain learner-interface interaction as follows: Learner-interface interaction is "a process of manipulating tools to accomplish a task" (p. 34). They further define it as a process where "successful learner-interface interaction requires the learner to operate from a paradigm that includes understanding not only the

procedures of working with the interface, but also the reasons why these procedures obtain results” (p. 34).

Although we agree with Hillman et al. that learners must understand the course or training interface in order to accomplish the learning objectives in distance education programs, we do not believe the concept meets our definition of an instructional interaction. It lacks reciprocal communication, a cornerstone of interactions as defined by Wagner (1994). As with learner-content, we present this summary as an issue found in the literature but will not address learner-interface as an interaction again in this report.

Learner-Vicarious Interaction

Vicarious interaction is a more recent form of interaction discussed in the literature. Only one researcher, Leah Sutton (2000), has written about this form of interaction (personal communication, April 10, 2000). She defines vicarious interaction as an interaction that is “one level removed” (p. 9). According to Sutton, vicarious interaction occurs “when a student actively observes and processes both sides of a direct interaction between two other students or between another student and the instructor” (p. 9).

Pedagogical Support

The theoretical framework for vicarious interaction is based on Piaget’s cognitive-elaboration theory and Bandura’s observational learning theory (Sutton, 2000). Piaget’s theory states that the interactions with others lead individuals to actively process information and, in turn, modify their own cognitive schemas (Sutton, 2000). Bandura’s observational theory states that learning occurs sequentially through attention, retention, production, and motivation stages. The first two stages, attention and retention, occur when

an observer absorbs, analyzes, and mentally processes the “modeled behavior” (p. 11).

Sutton combines these theories, asserting that interactions cause individuals to change their cognitive structures (Piaget’s elaboration theory) and that these changes occur through observation (Bandura’s observational theory, first two stages).

Sutton (2000) argues that individuals who normally would not initiate interaction on their own can benefit from observing other interactions of peers and instructors. This exposure to new ideas can alter vicarious learners’ mental schemas as though they were the ones who initiated or participated in the interaction.

Since there are no outward behavioral manifestations of vicarious interaction, it is impossible for our study to measure if such interactions occur. Therefore, vicarious interaction will not be addressed in the rest of the paper.




Methodology

To answer our research questions regarding each type of interaction, we conducted a survey of courses from three different training and educational sectors: government/military, higher education, and corporate. Based on convenience samples, we identified courses and products that met our definition of distance education and allowed us sufficient access to survey the interactions (learner-learner, learner-instructor, or learner-self) present. Whenever possible, we contacted course designers, instructors/ facilitators, and/or program managers for further information and access. Over two months, we reviewed six to seven courses from each sector. When possible, we observed and enrolled in the actual course or program. When this was not feasible, because of proprietary or other constraints, we examined course syllabi and other published course descriptions to gather information

about the interactions used. During our research, we searched for evidence of interactive features that complied with Wagner’s definition of interaction.

Our methodology for each sector was fairly consistent, except in the corporate sector. Because of difficulties accessing proprietary corporate programs, we investigated available e-learning programs and conducted case study reviews of corporate distance learning programs. We were able to catalog the interactive elements described in the case studies to enhance our study of the corporate sector beyond the few e-learning products we were permitted to access.

The specific methodologies and findings from the courses and products reviewed in each sector are discussed in subsequent sections. Each section includes a series of tables summarizing interactions present in the course or programs reviewed and a general summary of the interactions found within the sector. Based on the available evidence, a judgment is placed on the degree to which each interaction was incorporated for instructional purposes. The following legend applies to each summary table:

Legend for Interaction Summary Tables	
	Interaction present and integrated into course requirements as a regular event. Significant use.
	Tool present to facilitate interaction but not integrated as requirement of course. Little use.
	No evidence of interaction found in course materials.

Discussion of Sectors

Government/Military

Overview

The government and military sector was considered to include all government agencies and each branch of the uniformed military services. The organizations within the sector are characterized by being supported by appropriated funds rather than by any direct competition for revenue with the private sector of businesses and corporations. Government and military organizations have long been involved in distance education and have developed extensive coursework over many different delivery systems including online, satellite, video-conferencing, and correspondence, to name just a few.

Methodology

The majority of government and military training and education programs offer information via World Wide Web sites. Thus, an extensive Internet search was conducted to find distance education courses to investigate for interactive elements. Some organizations allowed direct access to courses, instructors and designers, and some restricted our access to only public information.

In addition to our general methodology of reviewing the course descriptions and syllabi, the project team participated in two distance course class sessions (U. S. Air Force and U. S. Coast Guard) and enrolled in two others. In all the courses, we were able to review the Web components first hand. The last two courses chosen for examination offered sufficient information via their Web sites to meet the requirements of the study.

In total thirty government/military sector organizations were surveyed for inclusion in the study. Those not included either did not fall within our definition of distance education or did not supply sufficient information to do a thorough analysis. The most prevalent government/military sector delivery system for distance education, satellite carried interactive television, was omitted from review because the students were at the same location or together in multiple locations (satellite downlink sites). Keegan's definition of distance education submits that the learner is separated from both the instructor and other learners. Table 1 summarizes the organizations and courses studied in the government/military sector.

Table 1	
Courses Reviewed in Government/Military Sector	
Organization	Course Surveyed
U. S. Air Force	Computer Software Engineering
U. S. Air Force	Virtual Schoolhouse e-learning
U. S. Coast Guard	Yeoman "A-School" rating course
Defense Acquisition University	E-learning courses - various
United Nations Institute for Training and Research	Correspondence courses - various
U. S. Navy	E-learning courses - various

Findings

The following tables outline the findings for interactive elements for selected distance education courses within the government/military sector. Each table describes the course studied, explains the interactions observed, and cites the evidence showing those interactions.

Course Interactions: Government/Military Sector	
Organization:	The United Nations Institute for Training and Research (UNITAR): Programme of Correspondence Instruction in Peacekeeping Operations
Location:	http://www.unitarpoci.org/
Course Description:	Multiple courses, all correspondence covering various topics of interest and peacekeeping operations. The course modality includes paper based correspondence materials, with a Web site that offers a discussion forum, chat room, and an interface to send questions to the instructor. Course writers are individuals from around the world. The correspondence materials are self-paced, and can lead to a Certificate of Training in Peace Support Operations after completion of a certain number of courses and a thesis.
Interactions Observed:	<u>Learner</u> : A chat room is available for students in any course to schedule for discussions about any topic, course related or otherwise. There is no requirement within the course for students to use this tool. The chat room is present, but since it is the same tool for over a thousand courses (each self-paced with no start/stop date) the interaction was deemed minimal to none. <u>Instructor</u> : Students may submit questions to the course writers through the course Web site (Web-based form, sent by e-mail). The course writers respond directly back to the students with facilitation by the UNITAR program managers. Students must initiate the interaction, as there is no interaction from the teacher to the student otherwise.
Evidence:	All information pertaining to this course was derived from the Web site listed above and in e-mail discussions with the manager of the program (Dr. Harvey Langholtz, personal communication, March 5, 2002). The chat room and course writer question form are linked directly from the Web site.
Comments: An e-mail conversation with Dr. Harvey Langholtz revealed that while the chat room and course writer question forum are available, students rarely, if ever, use them. The course writers do not design their courses to utilize the tools to enhance the learning impact of their courses since the correspondence materials are self-paced and the ability to plan for such an interaction is limited. The Web site administrators are reconsidering the need to have the chat room function for the courses.	

Course Interactions: Government/Military Sector	
Organization:	U. S. Air Force Institute of Technology – Virtual Schoolhouse
Location:	https://www.vsh.afit.edu/virtualschoolhouse/customers/sas/homepage/mainframe.htm
Course Description:	AFIT offers a number of courses for Air Force personnel professional development. A project team member enrolled and participated in Maintenance Planning- Sys170, a 10-hour Web-based course offered to Air Force personnel. The course is completely online and self-paced within a limited time-frame (start/stop dates). An instructor does not actively lead the course, although instructors are available to answer questions. Some courses

	within the Virtual Schoolhouse environment include instructor-led exercises.
Interactions Observed:	<p><u>Learner</u>: Chat rooms & bulletin boards are available for students to interact and share ideas and comments, although these were not mandated or incorporated into the Sys170 course.</p> <p><u>Instructor</u>: E-mail & bulletin boards serve as a communications medium between learners and the instructors. Sys170 does not have mandated learner-instructor interaction, but other programs within the Virtual Schoolhouse have instructor-led discussions and practice sessions.</p>
Evidence:	The Virtual Schoolhouse Web site offers course descriptions and help pages that describe the interactive elements of the course. One of the course designers/instructors offered information via e-mail (Michele Gaudreault, Maj USAF, personal communication, March 11, 2002).
<p>Comments: This "Virtual Schoolhouse" concept is a growing trend in military training. E-learning in the military, as in the corporate sector, is growing to address the professional development needs of the organization.</p> <p>Although the chat rooms and bulletin boards are designed to enhance interactions between the learner and other learners and the instructors, Major Gaudreault commented that they are rarely used. The chat rooms and bulletin boards are not critical learning elements of the course, as the individual lessons are self-contained and can be completed without intervention from either instructors or other students. There are a few exceptions, as the Web site discussed exercises and practice items coordinated and facilitated by an instructor through the interface for some courses.</p>	

Course Interactions: Government/Military Sector	
Organization:	Air Force Institute of Technology: School of Systems and Logistics
Location:	http://ls.afit.af.mil/spdp/cse493/cse493.htm
Course Description:	Computer Software Engineering (CSE) 493- Software Requirements and Design Engineering. A course designed by the Air Force and delivered via net conferencing (two-way audio through telephone conference call, whiteboard PC interface) and through the World Wide Web. Class materials are viewed and/or downloaded from the Web site, e-mailed, or observed during a weekly net (computer-based) conferencing session with the instructor. The course is designed to be self-study through the week, as students read assignments and respond to study questions provided by the instructor on the Web site. During weekly net conference, the instructor can deliver instruction directly to the students. Mid-term and final examinations are administered.
Interactions Observed:	<p><u>Learner</u>: During net conferencing session students can directly communicate with one another through a phone conferencing system. Chat rooms and e-mail are other alternatives for interactions during the Friday sessions and during the week to discuss assignments and instructional materials.</p> <p><u>Instructor</u>: During net conferencing session the instructor engages students in a direct dialogue over the phone in a conference environment, while presenting information (documents, presentations, etc) over the World Wide Web interface. Otherwise the instructor is available via e-mail, phone, or in a chat room environment throughout the week.</p>

Evidence:	Interactive elements observed through course syllabus (provided by the instructor, also available on the Web site), e-mails with the course instructor/designer (Greg Ahlquist, Major USAF, personal communications February 13 – March 12) and by attending a net conferencing session March 8, 2002. The syllabus speaks directly about learner-instructor interactions and discusses all of the interaction related tools.
Comments: This is the Air Force's first attempt at delivering a course including the net conferencing tool. Net conferencing allows students who do not have access to satellite downlink sites for in-class course delivery to participate in distance education courses. Combined with Web delivery of course materials, the current instructor feels the delivery method has great potential (personal communication). This is one of two courses reviewed in this sector that includes an instructor-led classroom function. For one hour the instructor engages students in lecture or discussion through the conference phone call, while presenting materials through the computer interface. The interface allows flexible content display, including files (PowerPoint common), virtual whiteboard, chat between students, etc. This once a week session complements the rest of the week's activities.	

Course Interactions: Government/Military Sector	
Organization:	U. S. Coast Guard: Training Center Petaluma, California
Location:	http://www.uscg.mil/hq/tcpet/training.htm
Course Description:	Yeoman "A-school." Multi-week course offered to enlisted Coast Guard personnel to acquire a rating designation, in this case as a Yeoman (administrative specialist). The course is primarily offered via the Web, using Web4m (www.web4m.com). The interface allows one way audio (instructor to student through Internet), virtual whiteboard, chat, discussion forums, team areas, document sharing, and other functions. Students enter the program with a cohort of students, but there is flexibility to allow students to work through the online material at a faster pace than their classmates, allowing them to finish the course early. Instructors frequently present virtual class sessions.
Interactions Observed:	<p><u>Learner:</u> Students are permitted to use the Web4m tool to set up discussion groups in chat rooms and use discussion forums. Learners can discuss content during live class sessions via the chat rooms and "whisper" mode functions, as well as a Web4m instant messaging function. Occasionally instructors hold teleconferences, and the students are encouraged to talk to each other through that medium.</p> <p><u>Instructor:</u> E-mail, chat functions, and direct interaction during class sessions via computer chat function. During live class sessions the instructor interacts with students either through a chat function or with live audio. "Virtual office hours" are scheduled when an instructor is available in a chat room for question and answer sessions. Occasionally teleconferences are held.</p>
Evidence:	Syllabus provided by course administrators, demonstration of course interface (www.web4m.com) by the Training Center Training Officer (Commander Richard Arnold) March 8, 2002, and e-mails with instructors and designers (David Nauta, Petty Officer First Class, USCG, personal communications, February 4 – March 5; Tony Field, Chief Petty Officer,

	USCG, personal communications, February 26 – March 6).
Comments: Web4m is a powerful commercial product that the Coast Guard utilizes for some of its distance course offerings. In one package Web4m combines several tools for learner and instructor interactions. The Coast Guard rating courses have many performance elements, so the interface offers functions that allow students to demonstrate competencies from a distance.	



















Course Interactions: Government/Military Sector	
Organization:	Defense Acquisition University (DAU)
Location:	http://www.dau.gov
Course Description:	The Defense Acquisition University (DAU) is a consortium of Department of Defense training institutions that provide mandatory, assignment specific, and continuing education courses for military and civilian personnel (DAU, n.d.). Multiple e-learning courses are offered covering various acquisition topics. Courses are offered in online self-paced mode, or as a hybrid with an online and resident component. Certificate and continuous learning programs are offered internally, and they have cooperative programs with the University of Phoenix and Florida Institute of Technology to offer degrees
Interactions Observed:	<u>Learner</u> : Asynchronous threaded discussion forums, chat rooms and e-mail discussions are encouraged but not provided for specific courses and are not required as instructional elements. <u>Instructor</u> : E-mail addresses for course instructors are available, although the instructor does not monitor or evaluate student progress. An instructor will answer questions if the student takes the initiative.
Evidence:	Extensive e-learning Web site (e-learning tutorial) and phone discussions (Chris St. John, personal communication, February 16, 2002).
Comments: The DAU would not allow the project team access to any specific courses, but their Web site was very informative and specific. The online courses are all related to government acquisitions, and complement the DAU's resident course offerings. Similar to corporate e-learning programs, the courses are seldom instructor-led and offer interactive opportunities that are not built in to the structure of the course as an instructional element. The chat rooms and discussion forums appear to be present for the chance occasion someone would want to use them.	

Course Interactions: Government/Military Sector	
Organization:	U. S. Navy E-learning
Location:	http://www.navylearning.navy.mil
Course Description:	The Navy offers 66 Department of the Navy library courses, 879 NetG courses, and 535 "Skillsoft" library courses. All courses are designed for Navy personnel professional development and are self paced with some interactive elements.
Interactions Observed:	<u>Learner</u> : Synchronous chat can be arranged through the Web site facilitator on a specific topic, and threaded discussion forums offer asynchronous opportunities. Neither are required for course completion. <u>Instructor</u> : Same as Learner-Learner, with the addition of e-mail tools for

	students to engage an instructor in discussion.
Evidence:	Primarily Navy's e-learning Web site. Project team member enrolled in various courses to experience interactive elements and program modality.
Comments: Similar to the Air Force's "Virtual Schoolhouse," Navy e-learning offers numerous courses covering professional development topics. The courses are intended to engage the students with interesting content, with other interactive elements (chat room, discussion forums) available for interested students. None of the courses are led live by an instructor unless a student specifically requests such a session, and none of the courses require use of the interactive tools for successful course completion.	

Summary

Table 2 summarizes the interactions found in the government/military sector courses. Learner-self was the only interaction absent from all of the organizations or courses reviewed. Each course offered evidence of the other interaction types to varying degrees.

Table 2			
Summary of Interactions - Government/Military			
Course Title	Interactions		
	Learner-Instructor	Learner-Learner	Learner-Self
U. S. Navy E-learning			
Defense Acquisition University			
Coast Guard Yeoman "A-school"			
AFIT CSE 493 - Computer Software Engineering			
AFIT Virtual Schoolhouse			
U.N. Peacekeeping			

From the descriptions of many of the programs and courses reviewed, it is clear that are tools to facilitate learner-learner and learner-instructor interactions are present. However, they are not necessarily used by the students or instructors. Given the self-paced nature of some e-learning courses, this is neither surprising nor necessarily a deficiency in the course, but a limitation of the instructional environment. For example, it is hard to imagine a scenario where students around the globe in a UNITAR correspondence course, being a heterogeneous student population, would come together in a chat room for a particular course. While the e-learning courses attract a relatively homogenous student population, the students will still not likely use the interactive tools without a reason to reach outside of the self-paced content for help or enrichment. A cost-benefit analysis of including these tools as part of a course when they are seldom, if ever, used is beyond the scope of this report, but would yield interesting data for program administrators.

Net conferencing and Web-based courses utilizing vendor interfaces are successfully delivered with numerous interactive elements. Growth in the use of these technologies has promise to produce quality instruction covering the broad spectrum of interactions.

Earlier in this report we identified several research questions for each type of interaction. They are discussed explicitly for the government/military sector below:

- What types of learner-instructor interaction are evident in sources studied?

The majority of the planned interactions were in chat rooms and threaded discussions. The most authentic interaction occurred in the net conferencing course via live two-way audio and in the Web4m course through one-way audio and two-way chat during instructor led class sessions. E-mail was also a popular communication mode for learner-instructor interactions.

- Is learner-learner interaction designed into distance learning courses? What tools are used to facilitate learner-learner interaction in the instruction?

Chat rooms, discussion forums and e-mail were talked about extensively though the course materials we reviewed. However, this interaction was only designed into two courses as part of an extensive instructional strategy. The other four courses offered the interaction as an optional activity for enrichment only.

- Is learner-self interaction explicitly designed into the course structure?

Although the literature review offers convincing evidence of this interaction's importance, no courses in the government/military sector showed evidence of activities for self-regulation or reflection.

Higher Education

Overview

The higher education sector includes two- and four-year public/private colleges and universities. Since distance education was first included in US post-secondary institutions in the late 1800s, its presence has steadily grown (PBS, 2001 ¶ 7). In 1995 and again in 1998 the National Center for Education Statistics (NCES) conducted a study in attempts to measure how pervasive distance learning was in higher education institutions. They found that it was rapidly expanding. In 1995, an estimated 753,370 students were enrolled in one or more distance education courses. Three years later, the enrollment soared to over 1.6 million. In 1995, 25,730 distance courses were offered. Three years later, the number of courses had increased to 54,470. Utilizing various delivery systems (among them, correspondence, video conferencing, satellite, online, etc), distance education is an ever growing option in higher education institutions (NCES, 1998).

Methodology

Assessing the types of interactions designed into online distance courses was a challenging, and almost impossible task. We began by contacting professors at several universities requesting access to distance courses for research purposes. In almost all cases, proprietary and political concerns prohibited faculty from granting us access to courses or course syllabi. In the end, Indiana University granted access to one of their distance programs and Boise State offered us a course syllabus. In order to expand the scope of courses surveyed beyond these two institutions, we visited dozens of university distance programs via the Web, in hopes of surveying courses from syllabi available electronically. This was more difficult than expected since access to most syllabi for distance courses and residential courses was based on an enrollment fee. We were able to access, however, a total of five courses, all of which had extensive information regarding the types of interactions designed into the course.

In addition to surveying higher education institutions, the project team tried to look at commercial products that, in conjunction with certain higher education institutions, offered graduate credit. Like higher education institutions, all of these products required a significant enrollment fee. Wanting to see if interactions in commercial courses differed significantly from other distance courses in higher education institutions, we paid to enroll in one commercial course.

In total, we previewed six courses (three graduate, three undergraduate) from six different institutions or organizations. Table 3 identifies the institution, course, and course level that we surveyed.

Table 3 Summary of Courses Reviewed in Higher Education Sector			
Institution	Course Surveyed	Undergrad	Graduate
Cornell University	Microeconomics 101	X	
Penn State University	Effective Writing: Technical Writing c202	X	
Texas A & M	Oceanography 608	X	
Boise State University	Introduction to Instruction and Performance Technology 536		X
Indiana University	Foundations of Instructional Technology r511		X
Classroom Connect	Administration I: Vision and Leadership		X

Findings

The following section outlines the findings for interactive elements in the selected distance education courses. Each table describes the course examined, explains the interactions observed, and cites the evidence of these interactions.

Course Interactions: Higher Education Sector	
Organization:	Cornell University, Microeconomics 101 intensive course
Location:	http://instruct1.cit.cornell.edu/Courses/econ101-dl/
Course Description:	<p>This intensive four week, three-credit microeconomics course taught the basic principles of microeconomics during the fall/spring break at Cornell university. There was one professor and one teaching assistant managing the course. Approximately fifteen students participated.</p> <p>Tools used: Basic Web pages. The only information that required authorized access was lecture information, which constituted notes and video.</p>
Interactions Observed:	<p><u>Learner:</u> The only manifestation of learner-learner interaction was a discussion board. A review of last semester's archives revealed that there were very few entries of students responding to fellow students.</p> <p><u>Instructor:</u> Both the instructor and teaching assistant used the discussion board frequently to answer questions students had regarding the weekly problem sets. In most cases, students used the discussion board to asking instructors questions and receive feedback. Exams and midterms were sent to students via email. They were returned in a similar manner. In addition to a discussion board, a general announcement board was used for the instructor to post general administrative comments as deemed necessary. Lectures (access requires password), problem sets, problem set answers, and additional resources were posted on the syllabus for each week's discussion topic.</p>

Evidence:	Reviewed all of course content and structure (except for lecture video and notes) via the Web at http://instruct1.cit.cornell.edu/Courses/econ101-dl/
<p>Comments: Last semester's archived discussion board revealed that most interactions were initiated by students and were learner-instructor in nature. Students would posit questions regarding the problem sets and would then receive a response from the instructor as opposed to from fellow peers. The discussion board was also dominated by a handful of students asking questions. The rest of the class did not contribute to the discussion board except for on rare occasions.</p> <p>According to the syllabus, 10% of students' grades were based on class participation or "Web interaction." No details were given as to the structure or frequency that students were expected to make comments or pose questions. The other 90% of the grade was determined by weekly assignments and course exams.</p>	

Course Interactions: Higher Education Sector	
Organization:	Boise State University; Instructional and Performance Technology Distance Master's Program IPT 536 Introduction to Instructional and Performance Technology
Location:	URL not provided
Course Description:	<p>This seventeen-week, three credit graduate course taught at Boise State University provided an overview of the field of instructional and performance technology. The syllabus included extensive instruction with regard to online protocols and logistics for turning in assignments and clearly outlined course objectives.</p> <p>Tools Used: Lotus Notes™ which supported both synchronous and asynchronous elements</p>
Interactions Observed:	<p><u>Learner:</u> A highly structured discussion board functioned as both a synchronous and asynchronous delivery method. While each student was required to post one response to the question, there was no criterion specified in regards to how many people you need to reply to. Teamwork was mentioned in the syllabus but not in great detail. The professor stated in the syllabus, "Sometimes I will put you in a group then ask you to work with your group members and report your final product at the end of the week [for the discussion topics]." The course schedule did not indicate when such teamwork would occur. However, in talking to a former student, he indicated that there were multiple assignments that required peer collaboration and made up an extensive part of the course. A "Hallway" or synchronous "chat" existed, though its use was not counted towards the class participation or discussion grade.</p> <p><u>Instructor:</u> Students had multiple venues to contact the professor: office hours, telephone, email, and discussion board. Within the discussion board there was a private/locked area where a student could express concerns to the instructor and the instructor could provide personal feedback to the individual (one-to-one). Each week,</p>

	<p>the professor posted topics/questions to generate discussion. Occasionally, she participated in the dialogue.</p> <p><u>Self:</u> Students were encouraged to be “reflective” in their postings.</p>
Evidence:	<p>Requested and received a copy of the complete course syllabus and first semester guidelines from the IPT department.</p> <p>Interviewed a student who had completed the course at a distance (Greg Wisener, personal communication, March 2, 2002)</p>
<p>Comments: Class participation and discussion participation constituted almost 40% of the student’s grade.</p> <p>During the interview, a former student commented that, over time, the weekly discussion postings began to be burdensome. People were “doing it just because they had to do it.” He also commented that the asynchronous time lapse made it difficult to get things done and thwarted “synergy.” According to the student, a conversation that could transpire in a twenty-minute phone call would take “four days” to unfold in an asynchronous environment.</p>	

Course Interactions: Higher Education Sector	
Organization:	Penn State University, Effective Writing: Technical Writing 202c
Location:	https://courses.worldcampus.psu.edu/welcome/engl202c/
Course Description:	<p>This was a twelve-week; three-credit course for undergraduate students who were studying and preparing for careers in the sciences and applied sciences. This cohort-based course consisted of printed materials and a Web site with lessons and communication tools (bulletin board, email). Students had one week per lesson. Each lesson contained online lecture material, reading assignments, and individual and group activities. Students were expected to spend 15 hours per week per lesson. Course objectives were clearly stated in the syllabus.</p> <p>Tools Used: WebCT™. The application supported both asynchronous (email, discussion board, grade posting) and synchronous (chat) tools.</p>
Interactions Observed:	<p><u>Learner:</u> Each week students were to post a comment in response to another student’s posting on the discussion board. This response was to be “less substantial” than the readings posting (Course syllabus). Students were required to “routinely” read drafts and offer revision suggestions to fellow classmate’s papers. Each paper required at least one peer feedback—a minimum of four peer feedbacks were required.</p> <p><u>Instructor:</u> The only instructor interactions indicated on the syllabus were for grading procedures. Grades were posted in the WebCT™ environment in a “my records” section. Students could view their grades as well as see how they compared with the rest of the class. Instructors graded student papers and provided feedback to make necessary improvements. How this transpired was not clearly stated in the syllabus.</p> <p><u>Self:</u> Multiple drafts for each paper were required. This constituted self-interaction as the student determined how to organize, re-organize, and re-write much of the content he/she has already articulated.</p>

Evidence:	Reviewed an extensive course syllabus at https://courses.worldcampus.psu.edu/welcome/engl202c/geninfo.shtml
Comments: 10% of student's grade is determined by their completion of peer paper critiques. There were four major writing projects throughout the course accounting for 75% of the student's grade. One can assume that learner-self interactions were more important to this professor, based on the heavy weight given in the grade breakdown.	

Course Interactions: Higher Education Sector	
Organization:	Texas A& M, Physical Oceanography OCNG 608
Location:	http://oceanworld.tamu.edu/ocean608/index.html
Course Description:	This eighteen week, three credit graduate level course was taught by the same instructor as a residential course for some students and distance course for others. Content consisted of a broad range of topics outlined on the syllabus in detail. Course objectives and student expectations were clearly stated. An extensive Web site with lecture files, reading assignments, and laboratory experiments were available for both distance and residential students. Tools used: Web page, telephone, email
Interactions Observed:	<u>Instructor:</u> Once a week, the professor had telephone discussions with each student regarding the two posted problems students were expected to have completed for that week. Students were encouraged to contact the instructor by email or phone.
Evidence:	Extensive course syllabus: http://oceanworld.tamu.edu/ocean608/ocng608_DE.html (distance course) http://oceanworld.tamu.edu/ocean608/index.html (residential course splash page)
<p>Comments: It was interesting to note the differences between the residential and distance course syllabi. 99% of the content was the same for both courses, yet there were some noticeable differences. One of the primary differences was that homework for the residential students was done in teams of four students. The instructor, Robert Stewart, writes in the syllabus, "I have found that students learn more through discussion with other students. Each of you brings a different perspective and knowledge to the team and by working together you can benefit from your teammates' skills." (http://oceanworld.tamu.edu/ocean608/ocng608_course_info.html ¶ 3)</p> <p>Yet, for distance students there was no collaborative learner-learner interaction designed into the course. Instead all interactions consisted of learner-instructor. It is interesting that while the professor sees the pedagogical benefits of collaborative learning (see residential syllabus), he does not incorporate it into his distance course.</p> <p>Another distinct difference was that instead of telephone discussions, residential students talked about the weekly problems posted by the professor in their bi-weekly classes. One could presume that these class discussions consisted of learner-learner as well as learner-instructor interactions.</p>	

Course Interactions: Higher Education Sector	
Organization:	Classroom Connect, Administration I: Technology Leadership and Vision
Location:	http://www.classroom.com Password required to access courses
Course Description:	<p>Classroom Connect is a commercial organization that offers a significant number of courses for continuing education and graduate credit. Adam State College, California State at Bakersfield, Pepperdine University, Plymouth State all offer graduate credit towards the completion of a large number of courses (n=66) offered by Classroom Connect. Completion of courses alone is not sufficient for receiving graduate credit. All universities require supplemental work in addition to the Classroom Connect course.</p> <p>The majority of classes has a 20-hour workload and lasts three to six weeks with a definite starting and stopping date. It is an entirely asynchronous learning environment. Based on a rubric provided in each syllabus, students receive an Exemplary, Satisfactory, and Unsatisfactory grade based on their participation and timely completion of assignments.</p> <p>We chose to evaluate one of the courses with an educational emphasis in the Leadership Department titled Admin I: Technology Leadership and Vision, though all the courses have a similar structure. This three week, 20-hour course had an instructor. Each week the class looked at a different topic. The number of participants who could enroll is not limited. Grading was based on participation in weekly discussions from the discussion forum, weekly completion of assignments, and submission of a final project.</p> <p>Tool Used: Secure and commercial Web site</p>
Interactions Observed:	<p><u>Learner:</u> As part of the assessment rubric for participation, in order to receive an Exemplary rating, participants were expected to respond to other learner's comments on the discussion board. Participants were also required to locate another learner in the class who shared similar interests and partner with them as a "critical" learner. They worked together to complete the final project. Students also posed questions to each other on the discussion board via the Web.</p> <p><u>Instructor:</u> The instructor made generic and direct comments to students on the discussion forum. Instructor provided students with written feedback on each of the three activities and final project turned in. In reviewing the discussion board, it was evident that the instructor did not participate in the discussion board dialogue.</p> <p><u>Self:</u> Students were asked to look at how their institution and technology plan was functioning. They had to redesign the plan the way they thought it would work best for their own school.</p>
Evidence:	Enrolled in actual course and accessed secure course syllabus
<p>Comments: A significant effort was made to incorporate real-life experience and relevancy into the course. All the projects and assignments required the learners to reflect on their own problems in educational leadership. The structure of the task emphasized learner-self interaction to a greater degree than most courses we surveyed.</p>	

Course Interactions: Higher Education Sector	
Organization:	Indiana University, Instructional Systems Technology Master's Program Instructional Technology Foundations, R511
Location:	Password required http://www.indiana.edu/~r511dm/dist/r511.htm
Course Description:	This fifteen week, three credit graduate course provided an introductory overview to the field and profession of Instructional Technology. Most students were working professionals beginning a Master's degree in Instructional Technology. Tool used: Site Scape Forum™
Interactions Observed:	<u>Learner:</u> There were weekly group deliverables that were completed by teams of three to four students. Students also participated in weekly entire class discussions where they responded to a posted discussion question and also responded to other student's postings. Posting dates were structured and clearly stated. <u>Instructor:</u> The professor and three teaching assistant's email and telephone numbers were available on the syllabus. The instructor provided one hour chat hours, or virtual office hours, each week where students could ask general questions regarding content or logistics. The instructor also contributed to the weekly discussions by posting a summary at the end of the week or intervening when the conversation had gone off track. <u>Self:</u> Three times in the course of the semester students were required to evaluate their own contributions and that of their peers for each of their group discussions. Student papers also required reflection, especially the final paper where students were required to tell a friend of family member "what is instructional technology as you understand it."
Evidence:	Requested and received accessed entire course syllabus. Interviewed the professor to understand how interactions were used. (Dr. Laurie Nelson, personal communication, March 10, 2002)
<p>Comments: There is a significant amount of learner-learner interaction and collaborative learning designed into the course. Approximately 75% of a student's grade is based on a blend of learner-learner interaction and engagement in course content.</p> <p>In an interview, the instructor said that she felt that the quality of interactions and student work in an online environment was as good as and even better than what occurs in a traditional classroom environment. She said that the comments posted were often incredibly insightful because students had time to consider what they shared. "Even I learned from these students."</p>	

It is difficult to draw conclusions from the above findings. Since access to most syllabi posted on the Web required authorization, our having found syllabi on the Web creates doubts as to their quality and comprehensiveness. For example, Cornell University

and Texas A&M offer a large number of distance courses, all of which require authorized access. On the other hand, we did access two courses that were significantly low-tech. How the interfaces, structure, and interactions of these courses differ from others offered from the same institution, we will never know. Thus, one is left wondering if the information we found was representative, not just of the sector, but of each institution as well. Nevertheless, we offer the following comments on what we examined.

Summary

Table 4 (page 35) summarizes the presence of interactions in each of the courses surveyed in the higher education sector. A unique feature of reviewing college courses is that we can determine, to some extent, how important professors deem certain types of interactions by looking at how much of students' grades were based on activities that incorporated the different interactions. In most cases the majority of course grades were not based on interactions, but on acquiring knowledge from content via books, online resources, writing assignments, and exams.

Table 4			
Summary of Interactions - Higher Education			
Course Title	Interactions		
	Learner- Instructor	Learner- Learner	Learner- Self
Microeconomics (CU)	●	●	○
Intro to Instruct. Technology (BSU)	◐	●	○
Effective Writing (PSU)	●	●	●
Oceanography (TAM)	●	○	○
Administration I (Classroom Connect)	●	●	●
Instruct. Technology Foundations (IU)	●	●	●

Yet, there were many instances where interactions were emphasized. Most courses included learner-learner interaction. While three of the courses only had 10% or less of the grade based on learner-learner interaction, some courses gave it significant weight in the grade distribution. For example, in both instructional technology courses surveyed 40% and 75% of students' grades were based on projects that required significant amounts of learner-learner interaction (Boise State and Indiana University respectively.) In Penn State's writing course, 75% of students' grades required learner-self interactions as evidenced by the writing and re-writing process. However, with the exception of Penn State, learner-self interaction was rarely quantified by a grade percentage.

In most cases, the undergraduate courses surveyed had fewer interactions designed into the instruction in comparison to the graduate courses surveyed. It would be interesting to determine through further research if this is a pattern or coincidence for distance courses in undergraduate and graduate settings.

The following questions outline what we intended our study to address. The responses relate to how higher education institutions are performing in regards to the interactions in question.

- What types of learner-instructor interaction are evident in sources studied?

Instructors used email, chat, discussion board, and even phone to communicate with individuals. Often times there were two discussion boards, one that was public where the instructor could comment to the entire class (one-to-many exchange) and one where she could communicate privately with individual students (one-to-one exchange).

- Is learner-learner interaction designed into distance learning courses? What tools are used to facilitate learner-learner interaction in the instruction?

Learner-learner interaction was present to varying degrees in all but one course surveyed. Two courses based as much as 40% to 75% of the course grade on quality learner-learner interactions (See Boise State and Indiana University). The majority of courses did not weigh learner-learner interaction as heavily. In most cases, only 10% of a student's grade was based on peer interaction, usually in the form of participation rather than collaborative work.

The primary tools used for learner-learner interaction were asynchronous discussion boards. Synchronous chats were also available in most cases, but these interactions typically did not constitute a part of the student's grade.

- Is learner-self interaction explicitly designed into the course structure?

Four of the six courses required some form of learner-self interaction. These forms of interaction were designed into the instruction as either project or writing assignments. The technical writing course had the strongest emphasis on learner-self interaction, due to the fact that students were required to complete multiple drafts for each paper. The re-writing process required a significant degree of self-reflection.

Corporate Sector

Overview

The corporate sector includes privately and publicly held businesses of all sizes and industries. For the purposes of this report, the organizations we examined were large, for-profit, often multinational companies. Although nearly 80% of workplace training is still conducted in classroom settings (ASTD, 2002), distance education is an important method of training delivery for many companies. In an atmosphere of rapidly changing business needs, intense competition, and cost containment, many organizations are developing distance education programs to help meet their learning needs. To present a more complete view of the corporate sector, our research encompasses two categories: e-learning products (which deliver various forms of instruction via the Internet or via corporate intranets) and case study descriptions of distance learning programs at various corporations.

A Broader Definition of Distance Education

Zane Berge, author of *Sustaining Distance Training*, defines distance education as “organized, formal training and education in which the learner is separated from the resources that are useful in learning the stated instructional goals” (Berge, 2001, p. 4). As we planned our research of the corporate sector, we realized that Berge’s broader definition would be more appropriate than Keegan’s for our purposes. This is because there are significant distance learning activities occurring in the corporate sector, including the use of e-learning, which may not fully meet the criteria of Keegan’s definition of distance learning. Given the high visibility and pervasiveness of e-learning products in corporate training and

training-related literature, the project team adopted Berge's definition and included several e-learning products in this study.

E-Learning Product Research

Methodology

To research current e-learning products, we first reviewed *T&D* (formerly *Training & Development*) from the year 2000 to present. We studied the magazine's e-learning product reviews to identify products that were highly recommended by L-Guide, a consulting company focused on assessing e-learning products. These courses were primarily designed and developed by major vendors in the United States. In addition to studying four products recommended by L-Guide, we included courses from two local vendors that offered free access to their products. Table 5 summarizes the course we evaluated. Most companies provided information predicated on our restricting access to the course and organization names, so we have used aliases for each course and withheld URLs and any other identifying information.

Organization	Course Surveyed
Company A	Basic Accounting
Company B	Time Management
Company C	Interviewing Skills
Company D	Diversity Appreciation
Company E	Change Management
Company F:	Diversity Awareness

Findings

The tables below summarize the e-learning courses and the interactions we discovered by reviewing available course details. The following companies sell these off-the-shelf courses to other companies for their use in department training.

Course Interactions: Corporate Sector E-learning	
Organization:	Company A, Basic Accounting
Course Description:	This 2-4 hour Web-based course includes ten lessons. Content is presented in various methods, such as 'Ask the question', 'View financial statement', 'Exercise', and 'Glossary'. Content is also delivered in text, photos, and audio. Students complete exercises on entering financial information. Tools used: Web based course.
Interactions Observed:	No interactions were observed.
Evidence:	Reviewed all course content and structure via course website
Comments: The course adopts a goal-based scenario model. There are no opportunities for learners to experience interactions in this course. This course does not have a forum to address instructional or technical questions. Instead, possible questions are pre-determined and listed in a 'Question index' with answers.	

Course Interactions: Corporate Sector E-learning	
Organization:	Company B, Time Management
Course Description:	This is a 2-4 hour Web-based course. There are six modules with five to nine lessons per module. Content is presented in formats such as text, mouseovers, simulations, matching exercises, and flipbooks. Also, quizzes are provided at the end of each module. Beyond the main content, there are other content sections that support learners such as Syllabus, Scores, Glossary, Orientation, Worksheet/Job aids, and printable content files in PDF format. Tools used: Web based course.
Interactions Observed:	<u>Learner:</u> Learners are encouraged to introduce themselves to classmates via a discussion forum for social purposes. Learners interact with each other via the discussion forum, chats with classmates, and instant messenger. <u>Instructor:</u> Course instructors (referred to as "tutors") are identified, but aside from providing feedback on student exercises they are not an active part of the course. Students submit some written exercises and email questions to the tutors, who are subject matter experts. The tutors provide specific feedback and respond to questions within 24 hours.
Evidence:	Reviewed all course content and structure via the program Web site.
Comments: The course includes all forms of interactions except learner-self interaction. The	

course is designed to make various types of interactions occur easily. Learners can interact with other learners in both asynchronous and synchronous formats. Unlike most products available on the market, tutors for this program are identified and respond quickly to the learners' queries or submitted assignments.

Course Interactions: Corporate Sector E-learning	
Organization:	Company C, Interviewing Skills
Course Description:	This is a 30-minute Web-based course including six brief sections. Content is presented only in text format mainly through explanation and summary. There are one-item, multiple-choice quizzes after each section. Tools used: Web based course.
Interactions Observed:	No interactions were observed.
Evidence:	Reviewed all course content and structure from the program Website.
Comments: The course structure is very simple and easy to follow. The materials are more self-study in nature since there are no interactions with instructor or other learners, and learners cannot get any help from other people. After learners finish the course, they are emailed a certificate of completion.	



















Course Interactions: Corporate Sector E-learning	
Organization:	Company D, Diversity Appreciation
Course Description:	This is a Web-based course consisting of three episodes. Each episode contains five to eight scenes. Content is presented in various text formats such as dialogue, email messages, journal entries, letters, and transcripts of voicemail messages. The voicemail messages are also provided in audio clips. Tools used: Web-based course.
Interactions Observed:	<u>Learner:</u> The interaction occurs in various online discussion forums and surveys. Learners can see others' opinions on certain topics and share their ideas through these tools. <u>Instructor:</u> A facilitator moderates discussions among learners in discussion forums and may ask questions to prompt learner dialogue. The facilitator typically does not offer instruction during the course. The tasks of the facilitator are not a structured part of the course. <u>Self:</u> Learners are asked to reflect on their opinions and beliefs at different points in the course and write about them.
Evidence:	Reviewed all course content and structure via the program Web site.
Comments: All the interaction types were observable in the course. The course is designed to put emphasis on learner-learner interaction by activities such as posting learner's own opinions based on episodes.	

Course Interactions: Corporate Sector E-learning	
Organization:	Company E, Change Management
Course Description:	This is a two-week demo course used to attract potential students to enroll in the online university. Content is presented in text and video with transcripts available. Also, learners can download and print the content. Tools used: Web-based course.
Interactions Observed:	<u>Learner:</u> There is a “Community Space” where learners can interact with each other as well as with instructors. An asynchronous discussion forum called “My Community” is divided into several categories such as Course, Functions, Industries, and Archived discussions. <u>Instructor:</u> An instructor is identified. There is an activity called “Explain It” in which students send responses to study questions to instructors, and receive feedback from an instructor within 30 minutes via e-mail. Faculty members also join discussion in the Community Space. <u>Self:</u> The course requires learners to submit essay type answers and participate in the discussion based on their reflection of the content.
Evidence:	Reviewed a sample of the course content and structure via the program Web site.
Comments: In this demo course, all the interaction types were observed. The Community Space encourages interactions between instructor and the learners and among the learners.	

Course Interactions: Corporate Sector E-learning	
Organization:	Company F, Diversity-1 Course
Course Description:	Diversity course: This is 1-2 hour Web-based course including 5 modules. The content is provided mainly in audio and supplemental text format. Learners have to solve one or two- item multiple-choice quizzes after each session. Tools used: Web-based course.
Interactions Observed:	None.
Evidence:	Reviewed all course content and structure via the program Web site.
Comments: This course does not have any opportunities for interaction and appears to be primarily designed as a self-study course. It does not provide a forum for technical or instructional support for learners.	

Summary

Table 6 is a summary of the interactions found in the corporate (e-learning) sector courses.

Table 6			
Summary of Interactions – Corporate E-learning			
E-learning Product	Interactions		
	Learner-Instructor	Learner-Learner	Learner-Self
Company A: Basic Accounting course			
Company B: Time management course			
Company C: interviewing course			
Company D: Diversity course			
Company E: Change course			
Company F: Diversity-1 course.			

Two out of six products have all three interactions present in the instruction. Company B & E both have strong learner-instructor and learner-learner interaction opportunities as part of the instructional strategies of the program. In Company D's product, learner-learner interaction is an important part of the instructional strategy. Learner-self interaction is present in company D & E, as learners are required to reflect on the required activities. Interestingly, three out of four products that are highly recommended by L-guide in *T&D* magazine do not have any interaction opportunities. Bear in mind that these

products were reviewed in isolation from the context in which they will actually be implemented. When we consider that these products are from off-the shelf vendors, we need to acknowledge the possibility that companies may add other interaction opportunities when implementing them as a part of a larger e-learning solution. Therefore, we do not have an entirely complete view of how they are used in real-life settings.

We began our research with a number of questions in mind regarding interaction:

- What types of learner-instructor interaction are evident in sources studied?

Three out of the six products do not have learner-instructor interaction. In the other three products, instructors use e-mails, discussion forums, and chats with learners. By using these tools, instructors answer the questions that students send, provide feedback, grade exercises, and facilitate discussion among learners

- Is learner-learner interaction designed into distance learning courses? What tools are used to facilitate learner-learner interaction in the instruction?

Three out of the six products do not have learner-learner interaction. In the other products, interaction opportunities are present in the form of activities that require learners to communicate with each other via discussion forums and chat rooms.

- Is learner-self interaction explicitly designed into the course structure?

Two of the six products have learner-self interaction. Both products are used for leadership development. Learners are asked to post their opinions on the discussion board based on their reflection on the content and to share their reflections with each other. In another course, learners have to send reflective essay responses on the content to their instructors.

Corporate Distance Education Case Studies

Methodology

In addition to exploring products from the popular field of e-learning, we wanted to research the use of interaction in corporate distance learning programs. Contacting corporations and requesting information about their distance learning programs did not

seem like a practical option, given the time constraints of this project and the potential difficulty of gaining access to proprietary information. Instead, we decided to obtain a convenience sample of detailed written descriptions of corporate distance learning programs. Our intention was to explore how the topic of interaction was addressed in these product descriptions.

During our research, we reviewed trade magazines *T&D*, *Training*, *Performance Improvement* and *Performance Improvement Quarterly* for the years 2000-present to gather current information regarding interaction in distance learning. This review of the literature produced a number of short articles regarding corporate distance learning programs. Several of these articles contained brief references to the importance of interaction in distance education, but most contained little detail about what forms of interaction were being used. However, we were able to find two suitable articles that contained substantial descriptions of distance education programs and their interaction opportunities.

We obtained the remainder of our case studies from the book *Sustaining Distance Training* (Berge, 2001). The articles were written by members of various organizations and typically described the planning, development, and successes of their distance learning programs. The units of analysis in the descriptions varied. Some described overall corporate distance learning programs, while others focused on specific distance learning courses. Although the articles were not specifically written on the topic of interaction, their program descriptions often provided fairly detailed information about the types of interactions used in these programs. Table 7 summarizes the organizations and courses described in the case studies.

Table 7 Corporate Sector Distance Education Case Studies	
Organization	Program Surveyed
Cap Gemini Ernst & Young	Distance education program overview
Daimler-Chrysler	Distance education program overview
First Union Bank	Human resources training
Ford	Distance education program overview
IBM	Management development program
SBC	Distance education program overview
Xerox	Leadership development program

The tables below summarize the findings regarding the distance learning programs in the organizations we examined.

Course Interactions: Corporate Sector Case Studies	
Organization:	Cap Gemini Ernst & Young
Course Description:	The Education and Training department offered three hundred different courses including computer programming, project management and team building. Learners worked with coaches, but studied individually, using realistic business cases and Web- or paper-based instructional materials. The target audience consisted of employees who specialized in the redesign of business processes or in the application of information technology. Some of the company's clients were also eligible to participate in this training program.
Interactions Observed:	<u>Instructor:</u> Learners posted questions for coaches in an online "Virtual Classroom." Coaches reviewed the questions and contacted the students via various methods, including telephone, videoconferencing and email.
Evidence:	"Integration of Individual Coaching in a Distance Learning Environment: Experiences at Cap Gemini Ernst & Young" in <i>Sustaining Distance Training</i> (Berge, 2001)

Comments: The main focus of this case study is its description of the evolution of the company's distance learning program. The interactions described above reflect the initial implementation of the program. This program is distinctive because learners interacted with coaches, but not with other learners. The authors note many issues related to the program, including: high development costs for online instructional materials; technological problems; the coaches' tendency to use video conferencing to communicate (which was time-consuming and costly); and little repeat business from departments that participated in the pilot program. The case study authors also discovered that, in the distance learning program, learners tended to procrastinate more in their coursework and to contact coaches only when they were in serious need of assistance. Overall, the authors discovered decreasing demand for the program, even following restructuring efforts.

Course Interactions: Corporate Sector Case Studies	
Organization:	Daimler-Chrysler
Courses Described:	Description of strategic planning and activities to expand their DE programs using Web technologies. One component of this was the creation of an online learning environment called LearnNTC.com. This was a sort of portal or virtual community center that allowed learners to access links to educational institutions offering online courses. It also provided support materials and gave learners chances to participate in community-building activities. Of particular interest is the planning by the group to prepare learners for successful online learning experiences.
Interactions described:	To prepare for online learning interaction, activities available on LearnNTC.com included the following: <u>Learner</u> : Participating in discussions and chat rooms, sending email messages with attachments. <u>Instructor</u> : Similar to learner-learner interactions, instructors participated in discussions and chat rooms, sending email messages with attachments.
Evidence:	"Strategic Planning for an Online Distance Education Program: Driving Change Through Education at the UAW-DaimlerChrysler" in <i>Sustaining Distance Education</i> (Berge, 2001).
Comments: The major focus of the study is its detailed description of planning for expansion of Web-based distance education. The company already has many types of distance programs but the authors believe that Web technology will greatly expand the reach of the program. Although the article did not explicitly address the topic of interaction itself, the authors recognized the need to prepare employees for success in online learning and online collaboration.	

Course Interactions: Corporate Sector Case Studies	
Organization:	First Union Bank
Courses Described:	A one-day, televised class on Managing Human Resources Policies delivered via satellite to remote sites throughout the country. Students were assigned short pre-course assignments prior to class to prepare them to participate in

	discussions, but the majority of the work occurred during the class.
Interactions described:	<p><u>Instructor:</u> Satellite-based video instruction with two-way communication via telephone. Learners could see the instructor, document camera, computer screen or VCR. Learners could also speak with instructors on private phone lines after class to discuss confidential issues pertaining to human resources-related problems.</p> <p><u>Learner:</u> Conference call feature allowed two-way communication among participants at various locations.</p>
Evidence:	“Sustaining Distance Education and Training at First Union Bank” in <i>Sustaining Distance Education</i> (Berge, 2001).
<p>Comments: The class is offered monthly at ten sites throughout the U.S. with approximately 150 participants at each site. The instructors set a goal for an interactivity level of 50%, meaning that half of the interactions in the class would be generated by the participants. Current classes approach an interactivity level of 80%. The instructor consistently poses questions to specific learner locations and solicits questions from all locations. Nineteen brief video role-play scenarios are used throughout the day to illustrate legal and policy issues. The role-plays have been extremely successful in encouraging learning participation in discussions. The case study authors also wrote that the success of the program created a paradigm shift regarding training: distance learning became the norm and classroom training became the exception.</p>	

Course Interactions: Corporate Sector Case Studies	
Organization:	Ford Motor Company
Courses Described:	The Ford Motor Company Dealer Training Program. Specific classes are not described, but all training is delivered via satellite to PCs at Ford dealer locations. The program is designed to “make training content available in convenient, adult-sized bites, rather than in week-long sessions at remote locations” (Berge, 2001, p. 181).
Interactions described:	<p><u>Learner:</u> Learners interacted with other learners during class via two-way audio. Class sizes were limited to provide sufficient opportunity for interaction.</p> <p><u>Instructor:</u> Satellite links provided live, one-way video and audio; telephone lines allowed learners to call instructor to ask questions or provide information. Learners could also contact the instructor through an audience response pad system.</p>
Evidence:	“Beyond the Sizzle: Sustaining Distance Training for Ford Motor Company Dealerships” in <i>Sustaining Distance Education</i> (Berge, 2001).
<p>Comments: The case study authors emphasized the importance of learner-centered, interactive design. They also emphasized that satellite-delivery ensures consistency in training delivered to a widely dispersed audience. In addition, the authors noted that instructors adapted from classroom delivery to video delivery more quickly than instructional designers did. Instructional designers had difficulty creating ways to sustain interactivity. As a result, Ford developed courses for instructional designers, such as “Learner-Centered Instructional Design for the Video Medium.”</p>	

Course Interactions: Corporate Sector Case Studies	
Organization:	IBM
Courses Described:	IBM's Basic Blue for Managers is a 50-week Web-based management development program. Considered a "hybrid" distance-learning program, it included some classroom contact for skill practice. Most information was delivered online. Learners used Manager Quick Views Web site, which contained segments similar to online job aids and addressed more than 40 topics. Learners would study coaching skills in Quick View, followed by practice in an interactive online coaching simulator.
Interactions described:	<p><u>Learner and instructor:</u> Some blended learning involved classroom sessions in which learners participated in collaborative activities and practiced skills learned through Quick View and the online simulator. No details were available about the frequency or duration of classroom instruction.</p> <p><u>Self:</u> One online session included a requirement that employees participate in individual review meetings with their managers to reflect on and describe the impact of their learning.</p>
Evidence:	"The Five Attributes of Innovative E-Learning," June, 2000 <i>T&D</i> .
<p>Comments: Although the classroom elements of this program might disqualify it as purely distance education, it is an interesting example of how a company is taking a blended approach to distance learning. The authors described the program in terms of Everett Rogers' writings about the diffusion of innovations: relative advantage, compatibility, trialability, observability and simplicity. Extensive formative evaluation occurred prior to launching online elements of the program. Focus groups were used after programs were launched for continuing improvement of the course.</p>	






















Course Interactions: Corporate Sector Case Studies	
Organization:	SBC Communications, Inc.
Courses Described:	General program overview, focusing on merging the distance training programs of Pacific Bell and Southwestern Bell (SWB) after the two companies combined to become SBC. The article addresses the use of both distance learning programs and computer-based training.
Interactions described:	<p><u>Learner:</u> Students could interact with one another during conference calls accompanying televised classes and by using response keypads.</p> <p><u>Instructor:</u> Before the two training organizations merged, SWB used two-way transmission of audio and video. Participants could contact the instructor and other learners via microphones, room cameras, document cameras, fax and telephone. Pacific Bell used one-way video and had participants phone in questions and comments. Both regions added student keypads that allowed interaction with the instructor and other learners. A student could press a call button, which allowed the instructor to see the student's name. The student could speak into a keypad microphone and be broadcast to class. Instructor could also display via video multiple-choice questions and have students respond via keypad. The instructor could then see all responses and address needs. Instructors noted that the use of the keypads improved distance classroom interaction.</p>

Evidence:	"Lessons from Merging SBC's Regional Telecom Training Centers" in <i>Sustaining Distance Training</i> (Berge, 2001).
Comments: The case study authors note that it is important to choose objectives and design courses specifically for the online environment. "The best courses were brief, content-heavy with concepts and policies and time-sensitive objectives appropriate for learning at a distance. Courses with hands-on practice that were shorter than two days worked best" (Berge, p. 63). Plans must also include successful deployment of the technology: "The worst thing you can do is put technology out there that does not work properly" (Berge, p. 64).	

Course Interactions: Corporate Sector Case Studies	
Organization:	Xerox
Courses Described:	Five-month leadership development program. Thirty-six geographically dispersed participants were divided into six-member teams. Teams were asked to identify and plan a project based on the company's strategic initiatives. The course also included instruction in general leadership skills. Coursework included three asynchronous online e-learning modules lasting one month each; modules included individual and team assignments. The group met for a three-day face-to-face session at the beginning of the program and held a two-day face-to-face session at the conclusion of the program. The majority of the coursework was completed via synchronous and asynchronous Web-based interaction.
Interactions described:	<p><u>Learner:</u> During the three-day, face-to-face session learners participated in team-building activities. For the team projects, learners communicated asynchronously online and via telephone conference calls. Team members also communicated via threaded discussions for the e-learning module activities. Online team-to-team feedback sessions were also included with each e-learning module.</p> <p><u>Instructor:</u> The program was launched with a virtual synchronous online kick-off session. The three-day, face-to-face session included individual coaching, followed by individualized coaching sessions via telephone. The final face-to-face session included interaction with facilitators and coaches.</p> <p><u>Self:</u> Self-assessments were included in the online-learning modules. Learners received feedback from other learners, coaches and facilitators; anecdotes suggested learner-self interaction resulting from the peer and instructor feedback process.</p>
Evidence:	"E-Leadership: A Two-Pronged Idea," March, 2002 <i>T&D</i> .
Comments: The case study author recommended teaching learners a "behavioral model" to address conflicts or problems that occur during group interactions. They also found it was important to be very clear about logistics and expectations in a Web-based learning environment.	

Summary

Table 8 summarizes the use of interactions as described in the case studies.

Table 8			
Summary of Interactions - Corporate Case Studies			
Course Title	Interactions		
	Learner- Instructor	Learner- Learner	Learner- Self
Cap Gemini Ernst & Young			
Daimler-Chrysler			
First Union Bank			
Ford			
IBM			
SBC			
Xerox			

Although the scope and duration of each instructional program differed greatly from one another, the emphasis on interaction was a common theme. Also, it was interesting to note that so much information was provided about interactions the product provided, even though the articles were not specifically written to document interaction alone.

The responses to the research questions for each type of interaction appear below:

- What types of learner-instructor interaction are evident in sources studied?

Three of the companies relied on satellite based video delivery, supported by two-

way audio (via telephone conference connections) and audience response keypads. Other forms of interaction present included videoconferencing, email, and telephone calls.

- Is learner-learner interaction designed into distance learning courses? What tools are used to facilitate learner-learner interaction in the instruction?

Six of the seven companies included learner-learner interaction. The tools used to promote this interaction included telephone conference calls and learner response keypads accompanying satellite based video delivery. Learners also interacted through synchronous and asynchronous online interactions.

- Is learner-self interaction explicitly designed into the course structure?

Two case studies contained evidence suggesting the presence of learner-self interaction. One company promoted learner-self interaction through the use of self-assessments, feedback and one-on-one coaching. At a second company, learner-self interaction was prompted by requiring the learners to discuss with their managers the value of their learning, and how it could be applied to the company. It seems likely that this requirement would have led to learner-self interaction by encouraging reflection about learning experiences. For each of these companies, the learner-self interactions occurred in management development courses. While it seems natural that learner-self interaction might not figure prominently in all types of distance education, it is not surprising that it would be present in courses emphasizing the development of leadership skills.

The case studies provide ample evidence of concern about the need for various forms of interaction in distance education in the corporate sector. The studies also suggest that while interactions are important, there is no *best* type of interaction or interactive technology – success seems to lie in finding the right approach based on the resources and needs of the company. The value in looking at this collection of studies is that they provide a glimpse of the interaction possibilities other companies could consider while developing or improving their own distance learning programs.

Summary and Recommendations

The intent of this study was to catalog different distance education practitioner's efforts to provide opportunities for interactions in their instruction. Through our survey of the three sectors –government/military, corporate, and higher education – it is obvious that there is some degree of acknowledgment of the importance of interaction. In all the sectors we found opportunities for learner-learner and learner-instructor interactions. While the interactions varied in their forms (chat rooms, discussion forums, e-mail, conferencing), the function appeared to be consistent in providing for collaboration, cooperation, feedback, and instructional support. Learner-self interaction was less common across all sectors, with some reflective activity found primarily in the higher education sector, less in corporate, and none in government/military.

The limitations of this study should be considered. We were careful not to make broad assertions about the *quality* of the interactions we found, since we were only able to make a superficial review of most of the courses. We were rarely able to speak with the actual designers to see what their intent was regarding the interactive elements we encountered. Also, our limited sample sizes and the inherent nature of a convenience sample made it difficult to generalize from a set of courses within a sector to the whole sector, and certainly not to the entire field of distance education. We also recognized as we reviewed coursework that a course should not be evaluated solely based on the presence or absence of any one or more interactions. Can a course be of instructional value without learner-learner interactions? Without learner-self interaction? Such questions are beyond the

scope of this project, as our purpose was to examine the *presence* or *absence* of interactions, not to assess the *quality* of the course based on the presence of interactions.

There is support in the literature for concentrating not on the *agents* involved in an interaction event (learner, instructor, etc), but rather on the intended outcomes of the event (Wagner, 1997). In this schema, a designer would not plan for learner-instructor interactions, but would instead concentrate on providing interaction opportunities in support of learning objectives or goals. Wagner proposes participation, feedback, motivation, team-building, and several others as examples of interaction outcomes. Relying on this schema would ensure that designers consider the learning objectives and audience before making decisions about what tools to incorporate into a course. As we noted in this study, several courses included interactive tools such as chat rooms and discussion forums in their interface, but in many cases the tools were not accounted for in the instructional strategy. They were present as an optional device for students to use or not at their discretion. We submit that any interaction should be closely scrutinized for instructional value and designed as an integral part of the learning objectives, rather than included for its *nice-to-have functionality*

In conclusion, we found much evidence of interaction in distance education courses. While it is not clear from research that all the types of interactions are required for effective instruction and learning, it is clear that it is possible to have interactions that do not by themselves add value to a course. Future studies should assess the importance of interaction with regards to learning achievement, and to what extent and in what form interaction should be planned into distance education programs.

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